ISSN 0778-5569

OFFICIAL ORGAN
OF THE

EUROPEAN GROUP OF LYMPHOLOGY
LATIN-MEDITERRANEAN CHAPTER OF ISL
SOCIETÀ ITALIANA DI LINFANGIOLOGIA
CZECH SOCIETY OF LYMPHOLOGY
ROMANIAN SOCIETY OF LYMPHOLOGY
GREEK SOCIETY OF LYMPHOLOGY

THE EUROPEAN JOURNAL OF lymphology

and related problems

VOLUME 28 • No. 74 • 2016

INDEXED IN EXCERPTA MEDICA

SUMMARY

42nd ESL Congress

Institut de Formation aux Métiers de la Santé
GHR Mulhouse et Sud Alsace
2, Rue du Dr Léon Mangeney, Mulhouse, France

THE EUROPEAN JOURNAL OF LYMPHOLOGY AND RELATED PROBLEMS (EJLRP)

The EJLRP - official organ of the European Group of Lymphology (ESL), Czech Society of Lymphology, Romanian Society of Lymphology, Greek Society of Lymphology, the Latin-Mediterranean Chapter of Lymphology (LMCL), the Società Italiana di Linfangiologia (SIL) covers all fields of Lymphology and aims to present a multidisciplinair approach to diseases of the lymphatic system, with information on the analysis, control and treatments of such diseases.

Topics
The topics include:
- anatomy and anatomopathology
- physiology and physiopathology
- pharmacology
- diagnostic methods (conventional radiology, nuclear medicine, ultrasonography, computed tomography, biopsy, nuclear magnetic resonance)
- therapy (surgery, medicine, radiotherapy, physical)
- oncology (primary lymphatic system diseases, lymphonodal metastatic process)
- immunology
- post-therapeutic complications
- upper and lower limb edemas

Manuscripts publications
Submitted manuscripts will be published in the form of Editorial, Review article, Original article, Teaching article, Special article, Work in progress, Case Report, Short Communications, Letter to the Editor (in English), Abstract (in English)

They will be subdivisided in Clinical and Basic Sciences.

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Associate-Editors also can receive and promote articles and start the review process.

Publications languages
Official language of the Journal is English.

Publication rate
The EJLRIP is published on a quarterly basis.

Subscription rates - All members of European Group of Lymphology or of National societies (with which the ESL has a cooperation agreement and whose fee includes a subscription to the EJLRP) receive the Journal free of charge.
Subscription rate for non-members is:
- for all issues, 30 € within European Countries, 50 € elsewhere,
- for single issue, 15 € within European Countries, 18 € elsewhere.

Annual subscription rate of ESL: 80 €

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Graphics: Duògrafi snc, Rome - Printed by Arti Grafiche Europa srl, Pomezia (Rome)

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Manuscripts should be submitted in triplicate (original and two copies); they should be double-spaced, with wide margins on one side of the paper only, and should be carefully prepared in the style of this journal and checked before submission. Typing errors should be corrected legibly.

All manuscripts are subject to copy editing and, if necessary, will be returned to the authors for open questions to be answered or for missing information to be supplied before being sent to the printers. When extensive corrections are necessary, authors are responsible for having manuscripts retyped.

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1. The manuscript should be divided clearly into an Introduction, Materials and Methods, Results, Discussion and Conclusion and References. The text should be concise and consistent as to spelling, abbreviations, etc…

2. The **title page** should include the title of the work, first and last name(s) of author(s), name of institution, any footnotes referring to the title (marked with an asterisk), and the address of the author to whom the proofs are to be sent.

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3. The **abstract** should be a summary of the hypothesis or aims of the work, the basic material and methods and the conclusion of the study.

4. Immediately following the abstract, up to 7 relevant **key words** should be sypplied for subject indexing.

5. **Footnotes**, other than those refering to the title heading, should be numbered consecutively.

6. The accuracy of the **References** is the responsibility of the authors.

The list of references should only include works that are cited in the text and that have been published or accepted for publication. Personal communications should be mentioned in the text only. The list should be in alphabetical order according to the first author's name. Works by two authors should be listed alphabetically according to the second author's name, then chronologically; those by three or more authors should be in chronological order. References should be styled as follows.

Biancos J.A., Eimaleh D.R., Leppo Jl.A. (1986) Effect of glucose and insulin infusion on the myocardial extraction of a radioiodinated methyl-substituted fatty acid. Eur. J. Nucl. Mad. 12: 120-124.
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THE EUROPEAN JOURNAL
OF
lymphology
and related problems
VOLUME 28 • No. 74 • 2016
INDEXED IN EXCERPTA MEDICA

GHR
Mulhouse Sud-Alsace

E.S.L.
European Society of Lymphology

42nd ESL CONGRESS

May 13th-14th, 2016 – Mulhouse, France

Congress Venue:

Institut de Formation aux Métiers de la Santé
GHR Mulhouse et Sud Alsace
2, Rue du Dr Léon Mangeney

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Jacques Lévy

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Diversity is Exotic

Dear Colleagues and Friends ,

The executive committee of the European Society of Lymphology has kindly give me the opportunity to organise the 42th ESL congress with the honorary presidency of Dr. Jacques Lévy (Director of Pole Heart-Lungs-Vessels of our Hospital) and the Co-President , my mentor in Vascular Medicine, Prof. Dominique Stéphan.

In my capacity of the president of the congress, it is a great honor and privilege for me to welcome you on 13-14 May , 2016 in Mulhouse.

Famous representatives of our discipline from all Europe will give an overview of actual research and problems of clinical lymphology.

Come to visit ESL-Congress in Mulhouse. The city welcomes you with its multi-cultural charm and many attractions: museums, music and tours.

With warm regards,

Amer Hamadé

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THE EUROPEAN JOURNAL
OF
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VOLUME 28 • No. 74 • 2016
INDEXED IN EXCERPTA MEDICA

SCIENTIFIC PROGRAM

Thursday, May 12th, 2016
Hotel Bristol, Mulhouse – Center

18.30 **ESL EXECUTIVE COMMITTEE MEETING**

Friday, May 13th, 2016
Grand Amphi

7.30-8.20 **REGISTRATION, WELCOME COFFEE**

8.20-8.25 **WELCOME TO THE CONGRESS**
Amer Hamadé, Francesco Boccardo

8.25-10.13 **I - EPIDEMIOLOGY, GENETICS, ANATOMY AND PHYSIOPATHOLOGY OF LYMPHATIC DISORDERS**
Chairmen: Sandro Michelini *(Rome, Italy)*, Dominique Stéphan *(Strasbourg, France)*, Marlys H. Witte *(Tuscon, USA)*, Evangelos Dimakakos *(Athens, Greece)*, Mario Ojeda-Uribe *(Mulhouse, France)*

8.25-8.35 **Entity of Lymphatic System. Anatomy and Physiology Consideration**
Oldrich Eliska *(Prague, Czech Republic)*

8.37-8.47 **Physiopathology of Lymphedema**
Etelka Földi *(Hinterzarten, Germany)*

8.49-8.59 **The Genetic Bases of Lymphedema**
Miikka Vikkula *(Brussels, Belgium)*

9.01-9.11 **From Molecular Genetics and Biology to Effective Treatments of Lymphatic Disorders**
Micheal Jeltsch *(Helsinki, Finland)*

9.13-9.23 **FOXC2 Disease-Mutation Identified in Lymphedema-Distichiasis Display an Impressive Modulation of Transcriptional Activity**
Matteo Bertelli *(Rome, Italy)*

9.25-9.35 **Our Experience in Primary Lymphedema Genetics Studies**
Sandro Michelini *(Rome, Italy)*

9.37-9.47 **The Hematopoietic Stem Cell Niche Concept**
Mario Ojeda-Uribe *(Mulhouse, France)*

9.49-9.59 **Immunological Examinations of Secondary Lymphedema**
Moriya Ohkuma *(Osaka, Japan)*

10.01-10.11 **Differential Diagnosis of Lower Extremity Lymphedema**
Andrzej Szuba *(Wroclaw, Poland)*

10.13-10.33 ***Break Coffee, Visit of the Exhibitors, Posters***

Friday, May 13th, 2016
Grand Amphi

10.33-11.57 **II - PREVENTION OF LYMPHATIC DISORDERS**
Chairmen: Etelka Földi *(Hinterzarten, Germany)*, Stéphane Vignes *(Paris, France)*, Andrzej Szuba *(Wroclaw, Poland)*, Ramzi Kacem *(Mulhouse, France)*

10.33-10.43 **Lympha Technique to Prevent Secondary Lymphedema**
Francesco Boccardo *(Genoa, Italy)*

10.45-10.55 **The Surgical Lymphatic Challenge in Vulvar Cancer**
Jean-François Rodier *(Strasbourg, France)*

10.57-11.07 **Treatment of Breast Cancer, How to Avoid the Lymphatic Complication?**
Didier Cohen and Marc Puygrenier *(Mulhouse, France)*

11.09-11.19 **Vascular Inguinal Surgery, How to Avoid the Lymphatic Complications?**
Afif Ghassani *(Mulhouse, France)*

11.21-11.31 **Aorto-iliac Surgery, How to Avoid the Lymphatic Complications?**
Eric Steinmetz *(Dijon, France)*

11.33-11.43 **The Use of Blue Dye in Preventing Lymphatic Injuries and Morbidity During Pelvis Nodal Dissection for Cervix Cancer**
Francesco Boccardo *(Genoa, Italy)*

11.45-11.55 **Treatment of Breast Cancer: is Axillar Lymphadenectomy Guilty in the Constitution of Lymphedema?**
Alexandre Pissas *(Bagnols-sur-Cèze, France)*

11.57 -12.10 **OPEN CEREMONY**

Amer Hamadé	*(President)*
Dominique Stéphan	*(Co-President)*
Jacques Lévy	*(Honorary President)*
Francesco Boccardo	*(President of the European Society of Lymphology)*
Sandro Michelini	*(President Elected of the International Society of Lymphology)*
Jean Sengler	*(President of the Medical Committee of GHR Mulhouse et Sud Alsace)*
Jean Rottner	*(Mayor of Mulhouse)*

12.10-13.15 ***Lunch, Visit of the Exhibitors, Posters***

Salle IFKM

12.10-13.15 **ISL EXECUTIVE COMMITTEE MEETING**

Friday, May 13th, 2016
Grand Amphi

13.15-14.24 **III - CONTROVERSIES IN LYMPHOLOGY**

Chairmen: Francesco Boccardo *(Genoa, Italy)*, Isabelle Quéré *(Montpellier, France)*, Oldrich Eliska *(Prague, Czech Republic)*, Nicolas Winisdoerffer *(Mulhouse, France)*

1 - Venotonic Drugs in Lymphology

13.15-13.25 Alberto Macciò *(Savona, Italy)*

13.25-13.35 Amer Hamadé *(Mulhouse, France)*

2 - Liposuction in Lymphology

13.39-13.49 Håkan Brorson *(Malmö, Sweden)*

13.49-13.59 Assaf Zeltzer *(Brussels, Belgium)*

3 - MLD... upper to 30 mmHg and Perspectives?

14.03-14.13 Jean-Paul Belgrado *(Brussels, Belgium)*

14.13-14.23 Albert Leduc *(Brussels, Belgium)*

Friday, May 13th, 2016
Grand Amphi

14.27-15.39 **IV - NEWS IN PHYSICAL AND MEDICAL TREATMENT OF LYMPHATIC DISORDERS**

Chairmen: Albert Leduc *(Brussels, Belgium)*, Alexandre Pissas *(Bagnols-sur-Cèze, France)*, Moriya Ohkuma *(Osaka, Japan)*, Jean-Baptiste François *(Mulhouse, France)*

14.27-14.37 **Axillary Web Syndrome: Impact of the Physical Therapy**
Olivier Leduc *(Brussels, Belgium)*

14.39-14.49 **Pathophysiology and Treatment of Lymphatic Malformations**
Miikka Vikkula *(Brussels, Belgium)*

14.51-15.01 **Acute Lymphangitis Score for Early Diagnosis and Treatment**
Alberto Macciò *(Savona, Italy)*

15.03-15.13 **Quality Control in Lymphedema Therapies**
Håkan Brorson *(Malmö, Sweden)*

15.15-15.25 **Management of Ulcers in Lower Extremities with Lymphedema**
Evangelos Dimakakos *(Athens, Greece)*

15.27-15.37 **Early Diagnosis and Treatment of Lymphedema a RCT Study Preliminary**
Karin Johansson *(Lund, Sweden)*

Friday, May 13th, 2016
Grand Amphi

15.39-16.51 **V - LYMPHATIC DISORDERS AND VASCULAR MALFORMATIONS IN PEDIATRIC**

Chairmen: Cristobal Papendieck *(Buenos Aires, Argentina)*, Loïc Vaillant *(Tours, France)*, Ningfei Liu *(Shanghai, China)*, Waldemar L. Olszewski *(Warsaw, Poland)*

15.39-15.49 **Lymphatic Malformations in Newborn**
Carlo Bellini *(Genoa, Italy)*

15.51-16.01 **Medical Therapy for Lymphatic Disorders in Chilhood**
Jochen Roessler *(Freiburg, Germany)*

16.03-16.13 **Management of Lymphedema in Children**
Isabelle Quéré *(Montpellier, France)*

16.15-16.25 **Lipomatous Overgrowth in Pediatrics**
Cristobal Papendieck *(Buenos Aires, Argentina)*

16.27-16.37 **Medical Treatment of Hemangioma in Children**
Catherine Michel *(Mulhouse, France)*

16.39-16.49 **Lymphatic Disorders in Klippel-Trenaunay Syndrome**
Olivia Boccara *(Paris, France)*

16.51-17.10 ***Coffee Break, Visit of the Exhibitors, Posters***

Friday, May 13th, 2016
Grand Amphi

17.10-18.34 **VI - NEWS IN SURGICAL TREATMENT OF LYMPHATIC DISORDERS**

Chairmen: Corradino Campisi *(Genoa, Italy)*, Eric Steinmetz *(Dijon, France)*, Håkan Brorson *(Malmö, Sweden)*, Manokaran Gurusami *(Chennai, India)*

17.10-17.20 **News Perspectives and Approach in Lymphoedema Treatment**
Corinne Becker *(Paris, France)*

17.22-17.32 **Update in One Site MLVA for Peripheral Lymphedema**
Corradino Campisi *(Genoa, Italy)*

17.34-17.44 **Replacement of Obliterated Lymphatic Collectors in Obstructive Lymphedema of Lower Limbs by Silicone Tubing Implant**
Waldemar L. Olszewski *(Warsaw, Poland)*

17.46-17.56 **Surgical Management of Primary Lymphedema – Our Experience**
Ningfei Liu *(Shanghai, China)*

17.58-18.08 **Lymphatic Vascular Grafting: Investigations on the Harvesting Site**
Ruediger Baumeister *(Munich, Germany)*

18.10-18.20 **The Surgical Lymphatic Challenge in Male Genital Lymphedema**
Martin Wald *(Prague, Czech Republic)*

18.22-18.32 **Novelties in Treating Advanced Cases of Lymphedema**
Corrado Campisi *(Genoa, Italy)*

18.34 **ESL EXECUTIVE COMMITTEE MEETING**

Friday, May 13th, 2016

20.00 **GALA DINNER (Registration)**
Musée National de l'Automobile
Collection Schlumpf
15 Rue de l'Epée, Mulhouse

Saturday, May 14th, 2016

7.30-8.20 **WELCOME COFFEE**

Salle IFKM

7.30-8.20 **ISL EXECUTIVE COMMITTEE MEETING**

Saturday, May 14th, 2016

Grand Amphi

8.20-9.32 **VII - SPECIAL CASES AND COMPLICATIONS OF LYMPHEDEMA**

Chairmen: Olivier Leduc *(Brussels, Belgium)*, Gilbert Thibaut *(Nancy, France)*, Ruediger Baumeister *(Munich, Germany)*, Yoganaden Mootien *(Mulhouse, France)*

8.20-8.30 **Lesion of Thoracic Duct: Clinical Case Report**
Sara Dessalvi *(Genoa, Italy)*

8.32-8.42 **Intestinal diseases and Lymphedema, a Rare Association?**
Stéphane Vignes *(Paris, France)*

8.44-8.54 **Puffy Hand Syndrome**
Dominique Stéphan *(Strasbourg, France)*

8.56-9.06 **Management of Lipedema**
Isabel Forner-Cordero *(Valencia, Spain)*

9.08-9.18 **The Fallacies in Lymphoedema a 30 Years Experience**
Manokaran Gurusami *(Chennai, India)*

9.20-9.30 **Infectious Complications of Lymphedema**
Loïc Vaillant *(Tours, France)*

Saturday, May 14th, 2016

Grand Amphi

9.32-10.44 **VIII - IMAGING IN LYMPHOLOGY**

Chairmen: Pierre Bourgeois *(Brussels, Belgium)*, Alain Pecking *(Paris, France)*, Miguel Amore *(Buenos Aires, Argentina)*, Catherine Turnani *(Mulhouse, France)*

9.32-9.44 **New Horizons in Lymphatic Imaging with US**
Denis Matter *(Strasbourg, France)*

9.46-9.56 **Indirect Lymphography in Lymphology**
Alain Pecking *(Paris, France)*

9.58-10.08 **Interest of the Lympho-Spet-CT in the Management of Edemas**
Pierre Bourgeois *(Brussels, Belgium)*

10.10-10.20 **Novelties in Lymphoscintigraphy for Lymphatic Diseases**
Giuseppe Villa *(Genoa, Italy)*

10.22-10.32 **In Vivo Imaging of the lymph Vessels and Changes of the Lymph Flow in Obesity**
Katrin Blum *(Dusseldorf, Germany)*

10.34-10.44 **Non-Contrast Magnetic Resonance Lymphography**
Lionnel Arrivé *(Paris, France)*

10.46-11.00 ***Coffee Break, Visit of the Exhibitors, Posters***

Saturday, May 14th, 2016

Grand Amphi

11.00-12.25 **IX - FREE COMMUNICATIONS**

Price Jacques Lévy: *Honorary President of the Congress*

The Best 2 Free Communications

Jury: Pierre Bourgeois, Evangelos Dimakakos, Sandro Michelini, Francesco Boccardo, Dominique Stéphan, Isabelle Quéré, Loïc Vaillant, Stéphane Vignes

11.00-12.28 **IX - FREE COMMUNICATIONS I**

Chairmen: Jean Paul Belgrado *(Brussels, Belgium)*, Isabel Forner-Cordero *(Valencia, Spain)*, Nick Gerbruers *(Antwerp, Belgium)*, Catherine Jung *(Strasbourg, France)*, Marina Cestari *(Terni, Italy)*

11.00-11.07 **Lymphoscintigraphic Assessment of the Manual Lymphatic Drainage (MLD) in Patients with Upper Limb Lymphedema (ULL): Preliminary Result**
Romain Barbieux *(Brussels, Belgium)*, A. Pluska, K. Enciso, M.M. Roman, M. Hardy, O. Leduc, A. Leduc, P. Bourgeois

11.08-11.15 **"Inguinal Lymph Nodes Veins" Their Relationship With Reccurrence Varicose**
Miguel Amore *(Buones Aires, Argentina)*, V. Sgarbanti, L. Otonelli, M. Di Paolo, I. Baroni Papaianni, J. Parra

11.16-11.23 **Deep Infrared Imaging: an Original Method to Identify Venous Impairment After Axillary Lymphnode Dissection**
Jean-Paul Belgrado *(Brusels, Belgium)*, L. Vandermeeren, S. Vankerckhove, J-B. Valsamis, V. Feipel, M. Rooze, J-J. Moraine, D. Hertens, B. Carly, F. Liebens

11.24-11.31 **Lipœdema: usefulness of lymphoscintigraphy**
Marina Cestari *(Terni, Italy)*

11.32-11.39 **Tackling Edema of The Breast – A New Concept of Compression BRA**
Nick Gebruers *(Antwerp, Belgium)*, E. Cassauwers, K. Bocklandt, H. Verbelen, F. Thiesen, T. Tondu, W. Tjalma

11.40-11.47 **Magnetic Resonance Imaging Shows Increased Content of Epi- and Subfascial Fat, and Subfascial Muscle Tissue/Water in Arm and Leg Lymphedema**
Mattias Hoffner *(Malmö, Sweden)*, P. Peterson, S. Månsson, H. Brorson

11.48-11.55 **The Physical Treatment of Oedema of the Limbs: the Leading Part of Manual Lymphatic Drainage**
Olivier Leduc *(Brussels, Belgium)*, P. Bourgeois, A. Leduc, P. Lievens

11.56-12.03 **Sever Lymphoedema and its Complications: Barrier or Professional Challenge**
Giovanni Moneta *(Rome, Italy)*, A. Failla, A. Fiorentino, V. Sainato, M. Cardone, S. Michelini

12.04-12.11 **Unexpecte Substitution Lymphatic Pathways After Rat's Axillary Nodes Dissection**
Frédéric Pastouret *(Brussels, Belgium)*, L. Cardozo, J. Lamote, P. Lievens

12.12-12.19 **Effectiveness of Follow Ups on Persistence of Lymphedema Reduction Following Home Based Complete Decongestive Therapy: an Indian Experience**
Manjusha R. Vagal *(Mumbai, India)*

12.20-12.27 **Value and Limit of Treatment of Lymphedema in Consulting Room**
Alessandro Failla *(Rome, Italy)*, G. Moneta, A. Fiorentino, V. Sainato, M. Cardone, S. Michelini

Saturday, May 14th, 2016
Amphi Bleu

11.00-12.28 **IX - FREE COMMUNICATIONS II**

Chairmen: Martin Wald *(Prague, Czech Republic)*, Corrado Campisi *(Genoa, Italy)*, Nele Adriaenssens *(Brussels, Belgium)*, Karin Johansson *(Lund, Sweden)*, Yesim Bakar *(Bolu, Turkey)*

11.00-11.07 **Influence of a Multidisciplinary Rehabilitation Program on Breast Cancer Related Lymphedema and Quality of Life**
Nele Adriaenssens *(Brussels, Belgium)*, J. Lamote, C. Fontaine, M. Van Hoeij, L. Decoster, S. De Be, S. Van De Vijver, J. De Greve

11.08-11.15 **Comparison of Different Physiotherapy Methods on Edema in Patients With Chronic Venous Insufficiency**
Özlem Çinar Özdemir *(Bolu, Turkey)*, Y. Bakar

11.16-11.23 **Manual Drainage With or Without Milking: Effect on Lymphoedema Arm**
Serge Theys *(Namur, Belgium)*, J. Charlemagne, M.E. Aguilar Ferrándiz, A. Genette, P. Lang, P. Hanson

11.24-11.31 **Preclinical TDC Measurement May be Predictive for the Onset of Arm Lymphedema in Breast Cancer Patients**
Tapani Lahtinen *(Kuopio, Finland)*, K. Johansson

11.32-11.39 **Live Indocyanine Green Lymphography Shows Differences in Effectiveness of MLD, Linforoll Massage and Intermittent Pneumatic Compression**
Marzanna T. Zaleska *(Warsaw, Poland)*, W.L. Olszewski

11.40-11.47 **Measurement of Tissue Dielectric Constant in Patients After Breast Cancer Surgery**
Alper Tuğral *(Bolu, Turkey)*, Y. Bakar

11.48-11.55 **Comparison of Reliability and Time-Efficiency of Volume Measurements of the Foot**
Nele Devoogdt *(Brussels, Belgium)*, R. Van Hemelrijck, A. Heynen, S. Thomis, M. Schmöcker

11.56-12.03 **Bacteria Are Present in Subcutaneous Tissue in Obstructive Lymphedema – Long-Term Penicillin Prevent Their Proliferation and Subsequent Host Inflammatory Response**
Ewa Stelmach *(Warsaw, Poland)*, W.L. Olszewski, M.T. Zaleska

12.04-12.11 **The International Compression Questionnaire: Reliability and Validity**
Sarah Thomis *(Brussel, Belgium)*, N. Devoogdt, R.J. Damstra, H. Partsch, G. Mosti, V. Keeley, E. Brouwer, A. Becker, J. Hafner

12.12-12.19 **Mid- and Long-Term Results in Postoperative Patency of Lymphatic Venous Side-to-end Anastomosis**
Jiro Maegawa *(Yokohama, Japan)*, Y. Yabuki, S. Matsubara, T. Mikami

12.20-12.27 **Interest of the Lymphoscintigraphic Investigation of the Deep Lymphatic System in Patients with Lower Limb Edema**
Mirela Mariana Roman *(Brussels, Belgium)*, F. Riviere, R. Barbieux, O. Leduc, A. Leduc, P. Bourgeois

Saturday, May 14th, 2016
Amphi Bleu

11.00-12.28 **X - POSTER**
Price: Groupe Hospitalier de la Région de Mulhouse et Sud Alsace
The Best 3 Posters

Jury: Dominique Stéphan, Catherine Yung, Pierre Michel, Golnaz Obringer, Michel Lehn-Hogg, Christian Seiller, Paul Eberlé, Sébastien Gaertner, Patrick Brunel, Virginie Soulier-Sotto

1. **Magnetic Resonance Imaging for Lymphatic Vessels Exploration: A Case Report**
Pierre Emmanuel Berthod *(Dijon, France)*, J.P. Cercueil, E. Steinmetz, B. Terriat

2. **Effectivity of Unstable Shoe in Lower Limb Lymphedema. A Follow up of One Year**
Yolanda Robledo do Nascimento *(Madrid, Spain)*, M. Rubio Alonso, E. Varela Donoso, M. de la Cueva Reguera, S. Fernández Martínez, R. Pérez García

3. **Tactics in the Treatment of Lower Limb Secondary Lymphedema**
S.E. Katorkin *(Semara, Russia)*, P.N. Myshentsev

4. **Lymphedema in Sentinel Node Negative Breast Cancer Patients: a Long Term View**
Hanne Verbelen *(Antwerp, Belgium)*, W. Tjalma, N. Gebruers

5. **Is a Lympho-linguist around the Corner?**
Serge Theys *(Namur, Belgium)*, J-Cl. Ferrandez, P-H. Ganchou

6. **Proprioception Modifications in Patients Suffering From Upper Limb Secondary Lymphoedema**
Marco Cardone *(Rome, Italy)*, A. Fiorentino, G. Moneta, A. Failla, B. Monni, S. Michelini

7. **Measurement of Lymphedema: Pythagoras vs Archimedes vs High-Tech**
Jean-Baptiste Valsamis *(Brussels, Belgium)*, S. Vankerckhove, L. Vandermeeren, J-J. Moraine, J-P. Belgrado

8. **Lipofilling of the Axillo to Reduce Secondary Lymphedema After Axillary Lymph Node Dissection**
Liesbeth Vandermeeren *(Brussels, Belgium)*, J-P. Belgrado, S. Vankerchove, J-B.Valsamis, V. Feipel, M. Rooze, J-J. Moraine, D. Hertens, B. Carly, F. Liebens

9. **Does the Revised Starling's Equation Modify the Therapeutic Management of Patients Suffering From Lymphedema (LE)?**
Gilbert Thibaut *(Nancy, France)*

10. **Looking for a Safe Way for the Withdrawal of Compression Garments in Patients With Breast Cancer Related Lymphedema**
Roser Belmonte *(Barcelona, Spain)*, A. Tortosa, M. Galindo, A. Romeo, M. Tejero, J. Muniesa

11. **Early Onset Primary Lymphedema of Lower Limbs. Delayed Diagnosis and Complications**
Cristina Herrera Ligero *(Valencia, Spain)*, L. García Márquez, P. Román Ramos, N. Guardiola Beltrán, L. Peña Paches

12. **Evaluation of the Efficacy and Safety of a Two-Layer Compression Bandage System in the Treatment of Lower Limbs Lymphedema**
Valérie Tauveron *(Tours, France)*, L. Vaillant

43. **Complexity of the Management of Microcystic Lymphatic Malformations Associated with Syndromic Vascular Malformations: 2 Cases Report**

Sébastien Gaertner *(Strasbourg, France)*, E-M. Cordeanu, A. André, W. Younes, F. Mazni-Mettouchi, A. Vorbuerger, J. Ristorto, C. Mirea, D. Stéphan

44. **Effect of Compression Alone or Combined with Exercise in Patients with Lipedema. A Pilot Study**

Isabel Forner-Cordero *(Valencia, Spain)*, G. Tortosa-Soriano, A. Alabajos-Cea, A.B. Ponce-Garrido, J. Muñoz-Langa

45. **Place of Antithrombotics in Lymphedema of Lower Limbs Associated to Erysipelas**

Naouel Bensalah *(Mulhouse, France)*, M. Hamadé, W. Younes, A. Jradi, P. Michel, G. Obringer, M. Lehn-Hogg, Nathalie Buschenrieder, A. Hamadé

Saturday, May 14th, 2016

Grand Amphi

12.29-13.00 **Price: JACQUES LÉVY** ***Honorary President of the Congress*** **/ Best 2 Free Communications**

Jacques Lévy Director: Pole Heart - Lungs - Vessels / GHR Mulhouse et Sud Alsace

Price: Groupe Hospitalier de la Région Mulhouse et Sud Alsace / Best 3 Posters

Marc Penaud Director: GHR Mulhouse et Sud Alsace

CLOSURE OF THE CONGRESS
Amer Hamadé, Francesco Boccardo

GENERAL ASSEMBLY OF ESL

13.00 **ESL EXECUTIVE COMMITTEE MEETING**

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THE EUROPEAN JOURNAL
OF
lymphology
and related problems
VOLUME 28 • No. 74 • 2015
INDEXED IN EXCERPTA MEDICA

Friday, May 13th, 2016 - Grand Amphi

Plenary Session I

EPIDEMIOLOGY, GENETICS, ANATOMY AND PHYSIOPATHOLOGY OF LYMPHATIC DISORDERS

ENTITY OF LYMPHATIC SYSTEM. ANATOMY AND PHYSIOLOGY CONSIDERATION

OLDRICH ELISKA
Department of Anatomy, First faculty of medicine, Charles University, Prague, Czech Republic

Introduction: In my country Czech republic some phlebologists and angiologists consider that the lymphatic system from many reasons (some of them are economic) is nearly same as arterial and venous system-tube system. Main reason is that lymphatic system is connected with previous systems and has similar structure. Nobody from lymphologists this reality deny but from morphology and physiology point of view are there important differences. We did the survey of the differences between arterial, venous and lymphatic systems on the basis of literature dates and of my research work.

Evaluation: Morphology differences are in structure of the wall, regularity and occurence valves, regeneration, inervation, genes, location, diameter of the vessels and embryology origin. Physiology differences are in content (blood and lymph), filtration and absorption of fluids, flow and pumping of lymph, influence of gravitation, imunity function et cetera.

Conclusion: In spite of the fact that lymphatic system is connected directly with venous system (in two places only) and indirectly with arterial system, morphology and function of lymphatic system is in basic features different from venous and arterial system. From this view the lymphatic system is separated system. Question: Does exists really something in human body separetely?

PHYSIOPATHOLOGY OF LYMPHEDEMA

ETELKA FÖLDI
Medical Director Földiklinik, Center for Lymphology, Hinterzarten, Germany

Blood vascular system, the lymphatics and connective tissue including neurological structure represent a whole unit. Blood vessels with the heart are a closed circulatory system and the blood flow is driven by the heart activity. The lymph drainage system is a collateral pathway to the blood circulation. Lymph flow is independent of heart activity. The strength of the lymphangiom activity determinates the level of the lymph flow.

The main task of the lymph drainage system is to secure the tissue homeostasis, that means the regulation of interstitial water volume, stabilisation and regulation of protein concentration in tissue fluid, maintain a normal supply of nutrients, remove of waste product, to keep the resirculation of lymphocyts, uphold the migration of tissue macrophages, dentritic cells, etc., eliminates cellular debris including chemical components from injured tissues.

Disturbances of the lymph formation and lymph flow alters intestitium: activates fibroblasts, macrophages, endothel cells and modified ECM, etc. with the following consequences: chronic inflammation. From clinical point of view the role of neurological structures respective of tissue inflammation is from great importance. In addition lymphedema is characterized by immune deficits with the consequence disturbances of the wound healing and promote recurrent erysipelas. The requirement to treat disturbances of the lymph drainage system successfully, is the mandatory knowledge of physiolopathology of the microcirculation and diseases of the connective tissue.

THE GENETIC BASES OF LYMPHEDEMA

MIIKKA VIKKULA
Human Molecular Genetics, de Duve Institute, Université catholique de Louvain, Brussels, Belgium

Background: Lymphedema, caused by dysfunction of lymphatic vessels, leads to disabling swelling that occurs mostly on the extremities. Lymphedema can be either primary (congenital) or secondary (acquired). Familial primary lymphedema commonly segregates in an autosomal dominant or recessive manner. It can also occur in combination with other clinical features. Nineteen mutated genes have been identified in different isolated or syndromic forms of lymphedema. However, the prevalence of primary lymphedema that can be explained by these genetic alterations is unknown. We have investigated systematically eleven of these putative genes.

Methods: We screened 112 index patients from **families** with inherited primary lymphedema and 328 patients with **sporadic or unknown origin** primary lymphedema. A targeted next generation sequencing panel for IonTorrent (Personal Genome Machine, PGM) was designed. We included coding regions of *FLT4, VEGFC, KIF11, FOXC2, SOX18, CCBE1, PTPN14, GATA2, IKBKG, GJC2* and *GJA1*.

Results: We discovered 44 mutations explaining 39% of the **inherited** cases. In addition, 49 mutations were found in **sporadic or with unknown origin** patients, explaining 15% of the cases. We are currently performing co-segregation analyses and more detailed clinical phenotyping for those patients with a more likely pathogenic nucleotide change.

Discussion: The genetic cause of primary lymphedema remains unexplained in 61% of patients with a family history and 85% of sporadic or with unknown origin cases. Identification of those genes is important for understanding of etiopathogenesis, stratification of treatments and generation of disease models. Interestingly, most of the proteins that are encoded by the genes mutated in primary lymphedema seem to act in a single functional pathway involving VEGFR3 signaling. This underscores the important role this pathway plays in lymphatic development and function, and suggests that the unknown genes may also have a role in the same pathway. We use whole exome sequencing (WES) to unravel those genes.

FROM MOLECULAR GENETICS AND BIOLOGY TO EFFECTIVE TREATMENTS OF LYMPHATIC DISORDERS

MICHEAL JELTSCH
Translational Cancer Biology Program and Wihuri Research Institute, Biomedicum Helsinki, University of Helsinki, Finland

In 1971, Judah Folkman proposed the concept of anti-angiogenic tumor therapy [1]. 12 years later, Harold Dvorak isolated the responsible growth factor VEGF [2]. Nine years later, Napoleone Ferrara reported the generation of neutralizing monoclonal antibodies against VEGF. Another five years later, Phase I trials started with the humanized version of one of the monoclonals: bevacizumab. Since 2004, when it received FDA approval, it has been marketed under the brand name Avastin [3].

The translation of basic biomedical research into tangible benefits for patients appears sometimes agonizingly slow. The public has been promised much by hyped scientific breakthroughs [4]. Scientific journals and scientists have played along in over-hyping scientific breakthroughs in the hope of impact factors and citations in order to secure and justify funding and fame [5]. Not surprisingly, practitioners ask when the discoveries from basic research will finally improve the standard of care for their patients.

Lymphatic research is no exception. Practitioners are largely still limited to symptomatic treatment and there seems to be still an invisible, but perceptible divide between those who do the molecular biology research and those who treat patients. The Avastin story is a plea for basic research: it might be complicated and it might take time, but it eventually does pay off. How is the lymphatic research community doing concerning the translation of research results into treatment options? Examples of lymphatic research in or shortly before the clinical trial stage include:

- Growth factor enhanced lymph node transplantation to treat secondary lymphedema [6]
- Utilizing the Schlemm channel's lymphatic character in glaucoma treatment [7]
- Anti-angiogenic tumor treatment with anti-lymphangiogenic agents [8]

Treatment of primary lymphedema with VEGF-C has been proposed [9]. However, our understanding of the physiological process of lymph vessel development is far from complete [10], despite significant recent progress in our understanding of developmental lymphangiogenesis [11,12] and first attempts at tissue-engineering lymphatic vessels [13].

If the results from high throughput cancer profilings are predictive of lymphatic conditions, then many patients will feature very individual, multifactorial disease profiles [14]. Even more challenging than the identification of such causes will be the development of treatment regimens that rapidly can be tailored to such individual needs.

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FOXC2 DISEASE-MUTATION IDENTIFIED IN LYMPHEDEMA - DISTICHIASIS DISPLAY AN IMPRESSIVE MODULATION OF TRANSCRIPTIONAL ACTIVITY

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Dominant mutations in the *FOXC2* gene cause a form of lymphedema primarily of the limbs that usually develops at or after puberty. In a large percentage of patients, lymphedema is accompanied by distichiasis. Other complications may include cardiac defects, varicose veins, ptosis, cleft palate, spinal extradural cysts, and photophobia. *FOXC2* is a member of the forkhead/winged-helix family of transcription factors and plays essential role in different developmental pathways and physiological processes. Most of *FOXC2* mutations described so far either truncate the protein or are missense mutations in the forkhead domain causing a loss of function. We previously described six unrelated families with primary lymphedema-distichiachis in which patients showed different *FOXC2* mutations located outside of the forkhead domain. Of those, four were missense mutations (p.A3, p.S370T, p.L487P, p.A492V), one a frameshift mutation (p.M276DfsX186) and the last one a stop mutation (p.Q420X). To assess their pathogenic potential, we have now examined the subcellular localization and the transactivation activity of the mutated proteins. All of them were able to localize into the nucleus; nevertheless, the p.M276DfsX186 truncated protein appeared to be sequestered into nuclear aggregates. A reduction in the ability to activate *FOXC1* response elements was detected in 50% of mutations, while the remaining ones caused an increase of protein transactivation activity. Our data clearly stated that either a complete loss or a significant gain of *FOXC2* function can cause a perturbation of lymphatic vessel formation leading to lymphedema.

OUR EXPERIENCE IN PRIMARY LYMPHEDEMA GENETICS STUDIES

MICHELINI SANDRO[1], BRUSON ALICE[2], CARDONE MARCO[1], SIROCCO FRANCESCO[2], FIORENTINO ALESSANDRO[1], CECCHIN STEFANO[2], SAINATO VINCENZO[1], BERTELLI MATTEO[2]
[1] *San Giovanni Battista Hospital, ACISMOM, Rome*
[2] *MAGI'SLAB, Rovereto, Italy*

Up to date, no one can say that all primary lymphedema are of genetic origin in all clinical cases. We know the genetic familial forms (VEGFR and FOXC2) and some cases in which these two genetic mutations are also present in clinical "sporadic" cases. But this does not mean that other causes, other than the mutation genetically passed (so-called Mendelian) may induce alterations in the protein sequence on the DNA of an embryo for various reasons (I can think of radiation, drug action - we think phocomelic thalidomide for example, - and perhaps many other causes or contributing factors).
In our experience of a total of one thousand two hundred ninety five patients with primary lymphoedema, 7.5 percent presented the disease at the birth, in the 3.8 percent it appeared before the second decade of life and about 90 percent it appeared from the third decade of life in on.
Always in our casuistry of 255 probands the 3.9 percent of patients with primary lymphoedema submitted a positive family history, 6.0 percent belonged to syndromic lymphoedema and 90 percent showed how sporadic forms.
Among the enrolled probands with clinical diagnosis of primary lymphoedema, a positive family history was documented in 42 individuals, while regarding the remaining ones we do not have any news. By direct sequencing of exons 17-26 of the gene VEGFR3, including adjacent intronic regions and the only exon of the gene FOXC2, including intronic regions adjacent, have been indentified 12 different not common nucleotide change in 12 patients (nine are new alterations): six nucleotide alterations are located within the FLT4 gene (13% of cases) and the same number (13%) within the FOXC2 gene. These nucleotide changes were absent in 100 healthy subjects. For 8 of these 12 patients has been documented a positive family history. Other mutated genes discovered in probands were: KIF 11, GJC2, GATA2, HGF. The study is going on the families. In some cases we discovered also two simultaneously mutated genes (like the association of mutation of KIF11 and GATA2) in the same subjects (also in familial cases).
In two cases we found a genetic mutation never described in literature: one in the codon 286 of gene VPR2 and the other in codon 5 of gene FLT4. The association between the mutation and the phenotype of lymphoedema is not clear and it will be further developed in other members of the same families, analyzing the problem.
In other cases we are studing the possible role of other genetic mutation regarding the GJB2, MET, HGF in lymphoedema developing. The study is in progress.
This double clinical and genetic assessment allows us to decide the more appropriate management of patient and his/her family and could also provide the possibility of determining transmission risks; enabling application to prenatal diagnosis.

THE HEMATOPOIETIC STEM CELL NICHE CONCEPT

MARIO OJEDA-URIBE
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Hematopoietic stem cell niches are present in diverse tissues throughout development beginning in the aorta- gonad-mesonephros (AGM) region and the yolk sac, followed by the placenta, fetal liver, spleen, and bone marrow. Postnatally, the bone marrow is the primary site of HSC maintenance and haematopoiesis but in response to haematopoietic stress the niche can shift to extramedullary sites.
The stem cell niche is the in vivo microenvironment where stem cells both reside and receive stimuli that determine their fate. Therefore, the niche should not be considered simply a physical location for stem cells, rather as the place where extrinsic signals interact and integrate to influence stem sell behavior. These stimuli include cell-to-cell and cell-matrix interactions and signals (molecules) that activate and/or repress genes and transcription programs. As a direct consequence of this interaction, stem cells are maintained in a dormant state, induced to self-renewal or commit to a more differentiated state.
Current data suggest there are specialized niches for distinct types of haematopoietic stem and progenitor cells and that each niche may be created by multiple cell types that contribute to the niches in unique as well as redundant ways. With the detail now emerging in our understanding of the bone marrow niche, a number of second order questions can be addressed. When stressed by infection, myeloablation, or neoplasia, what niche components change in number or function to modify haematopoiesis? Is there a hierarchy of niche components that determine these responses? Besides standard techniques to assess the content and distribution of HSC cells and their niches new non-invasive hybrid imaging procedures have also been proven to be useful to better define diagnostic and prognostic features of some hematological, inflammatory and infectious entities.

Keywords: hematopoietic stem-cell, hematopoietic niches, microenvironement, cell-cell interaction, bone marrow

IMMUNOLOGICAL EXAMINATIONS OF SECONDARY LYMPHEDEMA - THE SECOND REPORT AND THEIR CHANGES TREATMENT

MORIYA OHKUMA and TAKAYOSHI KANDA [1]
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Key Word: Immunology, secondary lymphedema,after treatment.

Introduction: In the last European Congress of Lymphology the authors have already presented immunological examinations of secondary lymphedema. To understand more accurately the patients are divided into 3 groups; I. Bilateral lymphedema of the lower extremity, II. Unilateral one of the lower, II' uninvolved lower extremity, III. unilateral one of the upper extremity, III' uninvolved upper extremity. PHA and PPD skin test are reevaluated. Their changes after the treatment of all examinations are also reported.

Method: Various immunological examinations are performed in randomely selected cases of 903 of secondary lymphedema patients. PHA is done in all 3 divided groups of 423 patients and is also compared with 25 cases of senile volunteers. PPD skin tests are done in 3 groups of the patients; I.70, II.171, II'153, and III. 21, III'20 cases(see above) and compared with 52 senile controls. For PPD skin tests all data are the ones before 1998 when the positive ratio of the Japanese adults was above 97%. All the examinations are done after 1-11 treatment courses of hyperthermia treatment of lymphedema(M. Ohkuma:Lymphol. 35:87-90, 2002).

Result: All examinations except PPD test and PHA before the treatment are already reported. i.e.C3, C4, CH50 and peripheral monocyte count are increased. PHA's of the all 3 divided groups are lower than senile controls. PPD skin tests show lower reactions than the senile controls in I. and II. and same in III. Lymphedematous extremites are not different from the univolved contralateral extremity in PPD tests. After the hyperthermia treatment C3, CH50 and peripheral monocyte count are more elevated. PHA as well as PPD skin test are increased in II alone. Again there are no difference in PPD test between the lymphedematous and contralateral uninvolved extremity.

Conclusion: C3,C4,CH50 and monocytes are increased. And they are more increased after treatment except C4. PHA is lower than volunteers in all 3 groups of lymphedema
and increased only in group II after the treatment. The results of PPD test are also lower than senile controls except group III. It is also increased only in group II after the treatment. There are no differences between the lymphedematous extremity and the contralateral uninvolved one before and even after the treatment.

DIFFERENTIAL DIAGNOSIS OF LOWER EXTREMITY LYMPHEDEMA

ANDRZEJ SZUBA
Wroclaw Medical University , Wroclaw, Poland

Chronic symmetric or asymmetric leg enlargement is one of frequent causes of angiologist's consultation. Usually patients are referred as suspected lymphedema.

Lymphedema of lower extremities can be unilateral and bilateral and may have different etiology and different clinical presentation.

Diagnostic approach in such cases obviously should include careful medical history (time course, onset - provoked on unprovoked, related symptoms, skin infections, family history, concomitant disorders) and physical exam (edema: pitting, non-pitting; lack of edema; Stemmer's sign, tenderness, skin changes, distribution of edema/enlargement, varicose veins/ collateral skin circulation, vascular bruits, increased pulsation, bony abnormalities)

Imaging studies should include lymphoscintygraphy, ultrasound examination, magnetic resonance imaging (or CT scan), occasionally PET-CT, arteriography or phlebography. ICG lymphography and classic lymphangiography might be also very hlpful.

Differential diagnoses include systemic diseases (congestive heart failure, hypoproteinemia, autoimmune/collagen diseases, Cushing's disease, myxedema) and a variety of common and rare disorders usually confined to legs:

1) *vascular disorders:* chronic venous insufficiency, posthrombotic syndrome, inferior vena cava syndrome, May-Thurner syndrome, microcystic and macrocystic lymphangiomas, hemangiomas, hemangioendothelioma, arteriovenous fistula, Parkes-Weber and Klippel-Trenaunay syndrome, arterial aneurysms;
2) *lipomateses:* lipedema, Dercum's disease, morbid obesity;
3) *primary neurogenic:* neurogenic muscle hypertrophy, complex regional pain syndrome;
4) *mixed origin and others:* Baker's cyst ruptured or compressing popliteal vein, pelvic and leg tumors malignant or benign (lipofibromatosis, lymphoma, sarcoma, liposarcoma), hemihypertrophy, Proteus syndrome, CLOVES syndrome, posttraumatic leg edema, chronic osteomyelitis, inflammatory myositis, factitious edema including Munchausen syndrome, cyclic idiopathic edema and others.

The diagnosis might be not straightforward and one should not forget basic imaging studies including lymphoscintigraphy and magnetic resonance even in seemingly obvious cases. One patient may have more than one problem (e.g. postthrombotic syndrome and lymphedema secondary to prostate cancer) and a thorough diagnostic process is always necessary.

PLENARY SESSION II
PREVENTION OF LYMPHATIC DISORDERS

LYMPHA TECHNIQUE TO PREVENT SECONDARY LYMPHEDEMA

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Purpose: Axillary and inguinofemoral lymphadenectomy carries a high risk of lymphedema of extremities. We assessed the feasibility of performing multiple lymphatic-venous anastomoses after axillary and inguinofemoral lymph node completion (Lymphatic Microsurgical Preventive Healing Approach - LYMPHA technique) and the possible benefit of LYMPHA for preventing lymphedema.

Methods: Between July, 2008 and October, 2014, 82 patients with breast cancer (BC), 11 with vulvar cancer (VC) and 16 with melanoma of the trunk (TM) requiring axillary or inguinofemoral lymphadenectomy underwent lymph node dissection and LYMPHA technique. Blue dye was injected into the arm or the thigh 10 minutes prior to surgery. Lymphatics afferent to the blue nodes were used to perform multiple lymphatic-venous anastomoses (MLVA) using a collateral branch of the axillary or great saphenous vein. Volumetry was performed pre and postoperatively in all patients. Lymphoscintigraphy was performed pre and postoperatively after at least 6 months, comparing pre-op and post-op lymph Transport Index (TI – normal below 10). Mean follow-up was 36 months (6-60 months).

Results: In BC group, patients with BMI higher than 30 were candidates for LYMPHA; patients with normal BMI were studied with lymphoscintigraphy which was able to point out latent lymphatic impairment, still not evident clinically. Five patients with VC underwent bilateral inguinofemoral lymphadenectomy, while the other 6 VC patients and all 16 patients with TM had unilateral node dissection. All patients were treated by the LYMPHA technique. No lymphocele or infectious complications occurred. Seventy-nine BC patients had no sign of lymphedema and volumetry was coincident to preoperative condition. In 3 patients (3,6%), belonging to the initial clinical experience, arm lymphedema occurred after 8-12 months postoperatively, usually with the appearance of lymphangitic attacks. Transient lower extremity edema occurred in 1 TM patient (6.25 %) which resolved after 2 months, and permanent lower extremity edema occurred in 1 VC patient (9 %). Lymphoscintigraphy in BG group showed the patency of lymphatic-venous anastomoses at 1-4 years after operation and an improvement of lymphatic TI compared to preoperative conditions in all patients except in 3 with clinical arm lymphedema. In VC and TM groups, lymphoscintigraphy demonstrated a post-operative TI below 10 in 8 VC and in 13 TM patients, between 10 and 14 in 2 VC and 3 TM (without clinical lymphedema), and 29 in 1 VC patient (with lymphedema).

Conclusions: The LYMPHA technique appears feasible, safe and effective for the prevention of upper and lower limb lymphedema, thereby improving the patient's quality of life and decreasing healthcare costs.

Keywords: LYMPHA technique, arm lymphedema, prevention, breast cancer, MLVA.

THE SURGICAL LYMPHATIC CHALLENGE IN VULVAR CANCER

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The primary goal of modern vulvar surgery is to minimize treatment-related morbidity, without compromising survival rates. Lower limb lymphedema, one of the most disabling sequella, is mainly observed after standard inguinofemoral lymph node dissection, especially when followed by adjuvant external beam radiotherapy.
Minimally invasive surgery, based on the sentinel node concept, first applied to invasive squamous cell carcinoma of the vulva in 1994, appears as an alternative procedure both reducing early (wound breakdown, lymphocyst, wound infection) and delayed morbidity (lymphedema, erysipela, chronic pains), additionaly decreasing hospital stay duration and improving micrometastases screening by the development of nodal ultrastaging (serial sectioning, immunohistochemical cytokeratin staining). Optimal sentinel node detection is currently proposed by using the combined technique (radiocolloïd peritumoral injection associated with lymphotropic blue dye) in early - stage tumors with invasion more than 1 mm in depth, unifocal T1 and T2 lesions, inferior to 4 cm in diameter, without palpable or suspicious groin nodes at preoperative CT- scan.
If the contribution of sentinel node biopsy to a significant improvement of quality of life remains nowadays questionable (Oonk et al., 2009; Novackova et al., 2012 and 2015), several major european (Van der Zee et al., 2008; Grootenhuis et al., 2016) and prospective north american (Levenback et al., 2012) studies and meta-analysis (Hassanzade et al., 2013; Meads et al., 2014; Covens et al., 2015) have recently highlighted the feasibility, the accuracy (high rates of sentinel node identification and low false negative rates) and the safety (no worsened impact on survival) of this less invasive surgical approach in selected indications.
The rarity of this gynecologic malignancy still remains an important limiting factor to its mastering and widespread diffusion, particularly in old-aged females with numerous medical co-morbidities. Therefore, previous extensive experience in the management of sentinel node biopsy in other tumor locations (invasive breast cancer, malignant cutaneous melanoma...) is mandatory. Given to the seriousness of the groin recurrence and the low number of salvage therapies, its practice should only be implemented, within a research protocol, in dedicated institutions by skilled and experimented surgeons in multidisciplinary teams involving radiologists, nuclear physicians, pathologists with a careful clinical monitoring and a close follow-up of patients.

TREATMENT OF BREAST CANCER, HOW TO AVOID THE LYMPHATIC COMPLICATION?

DIDIER COHEN and MARC PUYGRENIER
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VASCULAR INGUINAL SURGERY, HOW TO AVOID THE LYMPHATIC COMPLICATIONS?

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Groin incisions play a central role in various vascular surgical procedures. In addition to their traditional use in bypass procedures, endarterectomies and thromboembolectomies, more than 95% of all percutaneous interventions are performed by femoral access. Lymphorrhea due to classical and mini-invasive surgical interventions on femoral artery is a serious hindrance to patient treatment. The incidence and frequency of this type of complication may constitute a serious clinical problem.
Minimally invasive and fully percutaneous procedures performed via needle puncture, including the use of the fascial closure technique to close the femoral artery, eliminate the likelihood of the occurrence of this vascular complication.

AORTO-ILIAC SURGERY, HOW TO AVOID THE LYMPHATIC COMPLICATIONS?

ERIC STEINMETZ
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THE USE OF BLUE DYE IN PREVENTING LYMPHATIC INJURIES AND MORBIDITY DURING PELVIS NODAL DISSECTION FOR CERVIX CANCER

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Purpose: Different techniques have been developed to try to prevent lymphoceles (LCs) after sole pelvic or pelvic and paraaortic lymphadenectomy in gynecologic cancer (endometrial, ovarian or cervical cancer). Notwithstanding some of these techniques (i.e. collagen patch coated with human coagulation factors, electrothermal bipolar vessel sealing device) may potentially decrease the rate of symptomatic pelvic LCs, no one of them aims directly at the proper management of lymphatic channels and lymph nodes. We tested the feasibility and efficacy of the Blue Dye injected into the thigh to prevent LCs ad its related morbidity.

Materials and Methods: Ten patients with endometrial cancer requiring laparoscopic pelvic and paraaortic lymphadenectomy underwent Blue Dye injection into the thigh bilaterally 10 minutes before operation. Blue lymphatic channels (BLC) and lymph nodes (BLN) were identified intraoperativelly in all patients. BLN were removed and BLC were identified and closed with metallic clips. Blue lymphatic pathways which were lateral to and out of the surgical field could be identified and preserved. At the end, after a proper lavage of peritoneal and pelvic cavity with saline solution, it was possible to check any lymphatic leackage on the guide of the Blue Dye and close it immediately. No drainage neither sealing materials were used. Patient were followed up clinically and with ultrasound examinations postoperatively. Mean follow up was 4 months (2-8 months).

Results: No LCs occurred in 9 patients, they presented neither any clinical sign of lower limb lymphedema. LC occurred in 1 patient but without symptoms and there was no necessity to treat it afterwards. This patient did not develop any edema at the lower limbs.

Conclusions: Our preliminay experience with the use of the Blue Dye seems to prove the advantage of injecting the Blue Dye into the thigh bilaterally before performing pelvic and/or paraaortic lymphadenectomy in order to prevent LC and lower limb lymphedema, succeding to offer a better quality of life to patients affected from gynecological tumors.

Keywords: Lymphocele, gynecologic cancer, prevention, blue dye, lymphedema.

TREATMENT OF BREAST CANCER: IS AXILLAR LYMPHADENECTOMY GUILTY IN THE CONSTITUTION OF LYMPHEDEMA?

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It is commonly admitted by oncologic surgeons, radiotherapits and internists that surgery of breast cancer and complete clearing out of axilla and radiotherapy is of prime importance in the constitution of secondary lymphedema of upper limb. So in order to limit this phenomenon, the concept of sentinal lymph node was initiated 20 years ago for precise indications (little tumors, no existence of axillar adenopathy…) and now appears as the regular strategy according evidence based medicine.
Of course, strategy of respect of the lymphatic capital of mankind is an excellent concept and the oncological results of this method seem very good and do not expose patients to the eventuality of residual tumor material.
But the two very important questions remain without any precise answer:

1. Why only 10% of patients who underwent total axillar lymphadenectomy developed a secondary lymphedema?
2. Why, although using sentinel lymph node technic, some patients presented yet a secondary lymphadema?

So, with evidence, total lymphadenectomy do not systematically occur a lymphadema (only 10%). And sentinel lymph node do not prevent in 100% of cases, lymphedema.
To try to answer to those two important questions, we studied two cohorts:

1. Retrospective study of the lymphadematous patients treated in our unit of treatment of edema: 3500 in 33 years; 700 primary; 2800 secondary and; 2100 secondary of upper limb.
2. Prospective study since 33 years upon 830 patients with breast cancer, 675 treated by classical lymphadenectomy, 155 using the concept of sentinal lymph node.

I – PATIENTS WITH LYMPHEDEMA TREATED IN OUR UNIT OF TREATMENT

They were all treated by physical classical treatment. They come from many regions of FRANCE living far from our hospital structure.
We did two very important constatations on the 2100 patients.
1729 presented always a real injury (wound) of the vicariant derivative ways either MASCAGNI-SAPPEY's deltopectoral lymphatic trunk either tricipital or posterior scapular ways.
371 did not present any wound of derivative ways but presented in postoperative course the classical complications : lymphocela, lymphorrhea, with 2 or 3 ponctions and sometimes constitution of a lymphatic fistula.

II – 830 PATIENTS OPERATED FOR BREAST CANCER IN OUR DEPARTEMENT OF GENERAL SURGERY

Only 27 presented a secondary lymphadema. Those 27 patients presented a scare on the lymphatic vicariant derivative ways.
This scare is the witness of the impairment of the very important derivative trunk.
If the constatation of the scare, is anterior of surgery, it is mandatory to inform the patient of the high probability of lymphedema.
On those 27 patients operated for breast cancer (in our personal statistics of 830 patients) and who presented a lymphedema, 22 were operated by total clearing out of axilla (3,25%) and 5 with concept of sentinel lymph node (3,22%).
The difference is not significative and the edema is only depending upon the destruction of vicariant lymphatic way).

Plenary Session III
CONTROVERSIES IN LYMPHOLOGY

1 - Venotonic Drugs in Lymphology

DRUGS IN LYMPHEDEMA TREATMENT

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In lymphology, pharmacotherapy and nutraceutics have always been two hotly-debated and controversial areas. Hundreds of substances have been credited with having lymphotrophic properties or otherwise properties that aided the treatment of oedemas with a high protein content, such as lymphedema, both primary and secondary. Unfortunately, since very few scientific tests have been conducted on sound methodological grounds and on large enough samples, the substances that can be used for a combined treatment of lymphedema cannot be clearly listed yet. In addition, due to the complexity of the treatments delivered to patients, the positive effects of the drug cannot be easily assessed.
Phlebotropic drugs, such as sulodexide, for instance, are helpful in patients with a proven concurrent chronic venous disease. Likewise, at stage 3 of the CEAP classification, in which the onset of oedema in chronic phlebopathy is associated with a secondary decompensated failure of lymph circulation, aiding lymph circulation in combined lower-limb vascular diseases could in turn reduce such decompensated failure.
Loop diuretics as well as corticosteroids, even if they could suddenly and objectively reduce the volume of the oedema, seem to be contraindicated in the long-term treatment of chronic lymphedema.
Evidence about coumarin, which has been extensively investigated for many years in people suffering from lymphedema by Casley Smith and other authors, is very poor, as has also been pointed out by a more recent review by Cochrane, and also exhibits dose-dependent epatotoxicity, as has also been found for other nutraceutic substances. Clearer evidence (New England J. of Med., 2013) has been found as to the use of Long Acting Penicillin to reduce recurrent lymphangitis. Anthelmintic drugs turned out to be effective in the treatment of filariasis (diethylcarbamazine and albendazole) and therefore of any secondary lymphedema.
The use of MCT oil is indicated in the diet-therapy of patients suffering from abdominal lymphangiodisplasia or in all those cases in which the chiliferous component of the lymph is directly involved in the pathogenic process of lymphedema and where a strict low-fat diet is recommended.
Recent preliminary tests prove how important differential diagnosis is in the study of disorders of the lymph circulation. Such tests have actually proven that the substances diluted in the areas above the fascia in patients with peripheral oedema are extremely variable, which means that targeted and assessed approaches are needed for every single patient. The tendency of the derma to develop fibrosis, and therefore the tendency of lymphatic stasis to become chronic, are certainly the target that should be worked on. To sum up, lacking certain, reproducible scientific evidence, doctors should be called to give a more accurate indication of the currently available pharmacological substances, and the nutraceutical companies should be asked to be more clear about the substances contained in their preparations, which often are not specifically inspected and measured out, thus exposing patients to the risk of some secondary toxicity.

PLACE OF VENOTONIC DRUGS IN LYMPHOLOGY

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Introduction: Venotonics drugs are normally indicated for lymphovenous insufficiency.

Objectives: It is possible to determine their efficiency in the treatment of lymphorrhea and lymphedema of lower limbs by these drugs?

Patients and Methods: We report the case of 8 patients, 6 men and 2 women who presented lymphatic fistula with lymphorrhea on the inguinal region. The first group (4 patients) had been treated with high dose of Diosmin: 4 g/die for the first 5 days, 3 g/die for 10 days and after 2 g/die during 30 days associated to local medical care and compressive dressing at the level of the affected inguinal region. The second group (the remaining 4 patients) was only treated by compressive dressing combined with a local medical care. Also we studied 10 patients, 7 men and 3 women who presented lymphedema of lower limbs.These patients had been treated by Diosmin 3 g /die for 30 days. Doppler ultrasound did not identify venous complaint in any of the 18 patients.

Results: In patients with lymphorrhea: in both groups, the closing time of the lymphatic fistula was identical. In patients with lymphedema of lower limbs, no clinical improvement was noted after the treatment by veinocenetic drugs.

Conclusion: Taking into consideration these partial results, we consider the treatment of lymphorrhea and lymphedema of lower limbs using lymphovenotonic drugs not to be justified.

Keywords: venotonic drugs, lymphorrhea, lymphedema.

LIPOSUCTION IN LYMPHOLOGY

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Keywords: lymphedema, liposuction, adipose tissue, fat, outcome.

Introduction: Patients with chronic non-pitting lymphedema do not respond to conservative treatment because diminished lymph flow and inflammation result in the formation of excess subcutaneous adipose tissue.1 Previous surgical treatments utilizing either total excision with skin grafting or reduction plasty seldom achieved acceptable cosmetic and functional results. Microsurgical reconstructions, although attractive as a physiological concept, cannot provide complete reduction in chronic non-pitting lymphedema because they do not eliminate the newly formed subcutaneous adipose tissue collections. To remove the excess adipose seems thus to be a logical treatment strategy.2,3 These prospective studies describe the long-term outcome of liposuction of lymphedema.

Material and Methods: 146 women with non-pitting edema, a mean age of 63 (range, 39-89) years and a mean duration of arm swelling of 9 (range, 1-38) years underwent liposuction. Mean age at breast cancer operation, mean interval between breast cancer operation and lymphedema start, and duration of lymphedema were 52 years (range, 31-86), 3 years (range, 0-32), and 9 years (range, 1-38) respectively. Aspirate and arm volumes were recorded.

56 patients with an age of 52 years (range, 17-76) and duration of leg swelling of 14 years (range, 2-50) underwent liposuction due to non-pitting, chronic lymphedema. There were 29 primary (PL), and 27 secondary lymphedemas (SL) following cancer therapy. Age at cancer treatment and interval between cancer treatment and lymphedema start were 43 years (range, 20-65), and 3 years (range, 0-26) respectively. Age at onset of PL was 32 years (range, 4-63). All patients had received conservative treatment before surgery without further reduction. All were wearing compression garments before surgery. Aspirate and leg volumes were recorded.

Results, Arms: Preoperative mean excess volume was 1568 ml (range, 545-4235). Aspirate mean volume was 1807 ml (range, 650-3850) with an adipose tissue concentration of 95 % (range, 58-100). Postoperative mean reduction was 103 % (range, 50-194) at 3 months and more than 100% during 21 years' follow-up, i.e. the lymphedematous arm was somewhat smaller than the healthy arm. The preoperative mean ratio between the volumes of the edematous and healthy arms was 1.5, rapidly declining to 1.0 at 3 months, and less than 1.0 after one year (Figure 1, 2).

Figure 1. A 57-years-old woman with a non-pitting secondary lymphedema of 4 235 ml since 5 years following breast cancer treatment. Complete reduction 6 months after liposuction.

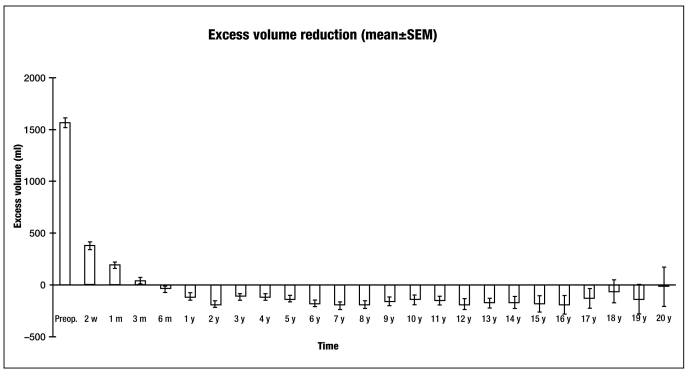

Figure 2. Mean postoperative excess volume reduction.

Legs: Preoperative excess volume was 3935 ml (range, 1200-8475). Aspirate volume was 3872 ml (range, 1210-8475) with an adipose tissue concentration of 94% (range, 61-100). Postoperative mean reduction was 83% (range, 22-135) at 3 months and 104% (range, 75-163) at 1 year, and more than 100% during 10 years' follow-up when it was 115% (range, 112-119), i.e. the lymphedematous leg was somewhat smaller than the healthy one (Figure 3, 4).

Figure 3. A 32-years-old woman with a non-pitting secondary leg lymphedema of 7 070 ml since 12 years following treatment of a synovial sarcoma in the right groin (left). Complete reduction 6 months after liposuction (right).

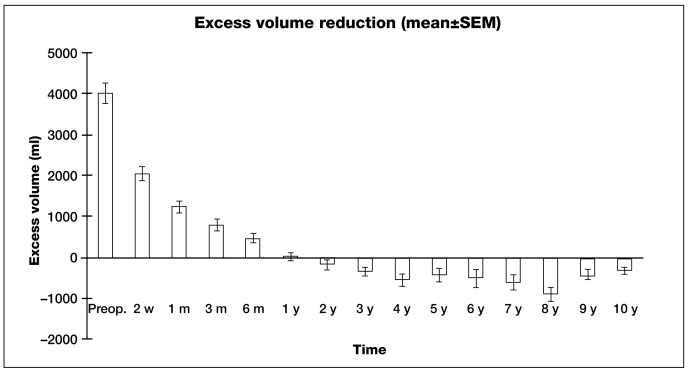

Figure 4. Mean postoperative excess volume reduction.

Conclusion: Liposuction is an effective method for treatment of chronic, non-pitting arm and leg lymphedema in patients who have failed conservative treatment. Because of adipose tissue hypertrophy, it is the only known method that completely reduces excess volume at all stages of arm lymphedema. Removing the hypertrophied adipose tissue is a prerequisite to achieve complete reduction (Figure 1 and 2). The reduced volume is maintained through continuous use of compression garments.

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LIPOSUCCION IN LYMPHOLOGY?!

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Our preferred treatment for lymphedema is the microsurgical option (LVA or lymph node transfer). Patients that present themselves to our lymphedma clinic are worked-up in order to do a clear staging of their condition. In the early stages of lymphedema patients are not candidates for liposuccion and other treatment modalities should be offered. Combination of treatments is done more frequently tailoring the approach to the individual patient. Liposuccion, what else?!

3 - MLD… upper to 30 mmHg and Perspectives?

OCCLUSION PRESSURE OF THE SUPERFICIAL LYMPH COLLECTORS

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Introduction: Consensus documents related to lymphedema treatment regards applied pressure on the skin as a core factor. Any paragraph dealing with manual lymph drainage, multicomponent bandages, or intermittent compression therapy evokes pressure "values" repeatedly. They clearly display the need to apply enough pressure to be efficient but are unclear about the values and threshold to avoid occlusion of the superficial lymphatic collectors. Documents refer terms such as "excessive pressure", "desired pressure", "gentle pressure", "optimal pressure" to describe the levels of pressure.
There is very little scientific data on occlusion pressure for superficial lymphatic collectors. Given its importance in determining the transport capacity of lymphatic vessels, it is crucial to know its value. The novel method of near-infrared fluorescence lymphatic imaging (NIRFLI) can be used to visualize lymphatic flow in real time.

Objectives: The goal of this study was to see if this method could be used to measure the lymphatic occlusion pressure.

Method / Design: The study was approved by the local ethical committee of the Academic Medical Center Saint Pierre – Université libre de Bruxelles, reference: AK/14/07-62/4391 and by the Belgian federal agency of drugs. Registered under the EudraCT number: 2014-002501-38 and the NCT 02359578.
We observed and recorded the lymph flow in the upper limb of healthy volunteers through a transparent cuff using near-infrared fluorescence lymphatic imaging. After obtaining a baseline of the lymph flow without pressure inside the cuff, the cuff was inflated by increments of 10 mm Hg starting at 30 mm Hg. and a NIRFLI guided manual lymphatic drainage technique named "Fill & Flush" method was performed during the measurement to promote lymph flow. Lymphatic occlusion pressure was determined by observing when lymph flow stopped under the cuff.

Results: We measured the lymphatic occlusion pressure on 30 healthy volunteers (11 men and 19 women). Mean lymphatic occlusion pressure in the upper limb was 86 mm Hg (CI ± 3.7 mm Hg, $\alpha = 0.5\%$). No significant differences were found between age groups ($p = 0{,}18$), gender ($p = 0{,}12$) or limb side ($p = 0{,}85$).

Conclusions: NIRFLI, a transparent sphygmomanometer cuff and the "Fill and Flush" manual lymphatic drainage method were used to measure the lymphatic occlusion pressure in 30 healthy humans. The combination of these techniques allows the visualization of the lymph flow in real time, while ensuring the continuous filling of the lymph collectors during the measurement session, reducing false negative observations.
The measured occlusion pressures are much higher than previously described in the medical literature.
The primary results regarding the occlusion pressure of the superficial lymph collectors of the lower limb show that the values surpass systematically 140 mm Hg in all subjects. That led to give argument that pumping power of the distal superficial collectors is higher than proximal.
The paper was accepted for publication in the journal "Lymphatic Research and Biology".

Key words: Occlusion pressure, Superficial lymphatic collectors, Manual lymph drainage.

MANUAL LYMPHATIC DRAINAGE: NO MORE THAN 30 MM HG MANUAL PRESSURE?

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Introduction: A soft pressure during MLD was proposed years ago by Winiwater and Vodder.

Objectives: Oedema is an abnormal increase of the tissue volume and is the sign of a lymphatic insufficiency. To correspond to a medical treatment, both the increase of the tissue volume and the lymphatic insufficiency must being treated. This study consists to APPRECIATE THE BEST MLD PRESSURE INTENSITY TO BE APPLIED DURING THE TREATMENT OF OEDEMA.

Method and Results: First of all we have to consider the goal of the MLD treatment.

a) **MLD to prevent oedema:** some publications demonstrate that soft MLD could be applied to prevent oedema after breast cancer surgery (1,2).

b) **MLD to treat oedema** is applied on the derivative pathways and on the oedema self. It is well known that the superficial venous flow, on the level of the upper limb, is occluded by a tourniquet when the pressure intensity is more elevate than 50 mm of Hg. Our investigations performed by lymphoscintigraphy and s by Indocyanine green injections are showing that a 20 mm Hg pressure intensity, induced by a tourniquet, is totally closing the lymph flow. When MLD stimulates the derivative pathways by using the inciting technique, the manipulations take place on a non oedematous area. The goal consists to facilitate the derivative pathways to transfer the oedema too well existing lymph nodes. These manipulations take place on superficial vessels in a non oedematous area. Conclusion: manipulation may be more intensive but there is no reason to do so (3).

When MLD is resorbing the oedema himself. This is a more delicate question because it is well known that oedema is developing a permanent inflammatory process and we disagree with intensive manipulations in these conditions.

Conclusion: When you can obtain good positive results with soft manipulations, why should you prefer more intensive manipulations? Do'nt be aggressive when you can have the same results being soft. Considering these different reasons we suggest to use soft MLD manipulations. This is our point of view!

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Plenary Session IV
NEWS IN PHYSICAL AND MEDICAL TREATMENT OF LYMPHATIC DISORDERS

EVALUATION OF THE AXILLARY WEB SYNDROMES (AWS) BY LYMPHOSCINTIGRAPHIC IMAGING

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Introduction: The Axillary Web Syndrome (AWS) can develop after breast cancer surgery and consists in one or more frequently two or three cords of subcutaneous tissue. Strings originate from the axilla, spread to the antero-medial surface of the arm down to the elbow and then move into the antero-medial aspect of the forearm and sometimes into the root of the thumb. The purpose of this study was to analyse these cords by lymphoscintigraphy before and after physical treatment.

Material and Methods: The both upper limbs of 46 women with clinically (either obvious, or suspected) AWS were investigated using lymphoscintigraphic protocol. Physical treatment of the cords is proposed for each patient.19 patients have accepted a lymphoscintigraphic control after cord's disappearance.

Results: Before treatment, lymphoscintigraphy was analyzed as normal in 4 cases. In all other patients, a decreased lymphatic function was observed. Among these 19 patients, 3 showed, either localized, or extensive lymphatic colloidal "stasis" (pattern A). In 6 patients, one complete stop on the lymphatic pathway was found (pattern B), in 4 additional cases, lymph stasis with localized colloidal attachment on the lymphatic pathway with obvious collateralization(s) (pattern B-C) and in 2 cases only collateralization(s) were observed (pattern C). After treatment the A and B patterns evolved to the C pattern.

Conclusion: Our lymphoscintigraphic evaluations of these situations suggest that the AWS is initiated with an "inflammatory process" of the lymphatic vessel (pattern A) and may evolve to a lymphatic thrombosis (pattern B) with the final development to lymphatic collaterals (pattern C). The physical treatment proposed induces the cord's disappearance corresponding to lymphoscintigraphy evolution.

PATHOPHYSIOLOGY AND TREATMENT OF LYMPHATIC MALFORMATIONS

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Background: Lymphatic malformations (LMs) are congenital, localized, cystic lesions that slowly develop with the growth of the child. Current treatments include sclerotherapy, surgical resection and debulking. LMs are usually sporadic. Their etiopathogenesis has remained unknown. In syndromic patients with congenital lipomatous overgrowth, vascular malformations, epidermal nevi, and skeletal/spinal abnormalities (CLOVES), somatic activating mutations were identified in PIK3CA.

Methods: We performed genetic screens on lymphatic malformations resected from 72 non-syndromic patients. We used targeted next-generation sequencing (Ion Torrent) to especially screen PIK3CA coding regions. Twelve samples were run in parallel to reach a high vertical depth (vertical coverage) to identify mutant alleles in as low as 0,5-1% frequency. Mean depth was 2079 X. We also initiated a clinical pilot study with rapamycin on selected patients.

Results: We found a hot-spot mutation in 71% of patients (51/72): 18 E542K mutations, 17 E545K mutations, 11 H1047R mutations and 5 others. Mutations in the helical domain accounted for 75% of the mutations found. The same amino acid substitutions are found in cancers, with activation of PIK3CA. Mutant allele frequency was sometimes only 1%. Since the phenotype differs from CLOVES, we assume that in LMs, the somatic mutation appears later in development and in a more restricted number of cells, possibly exclusively in lymphatic endothelial cells. Rapamycin alleviated symptoms in the 10 first patients enrolled.

Conclusion: The high frequency of mutations identified suggests that LMs are mainly caused by PIK3CA mutations. As LMs do not transform into cancer, these data also demonstrate that activating PIK3CA mutations alone cannot be the cause of malignancy. The PI3K signaling-pathway is a precise target to develop novel therapies for LMs, and rapamycin appears effective.

ACUTE LYMPHANGITIS SCORE FOR EARLY DIAGNOSIS AND TREATMENT

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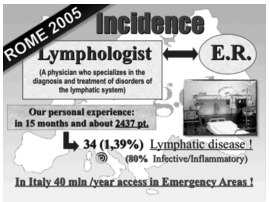
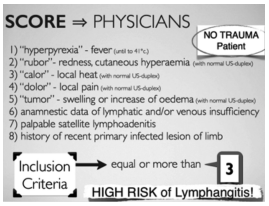
By lymphangitis, we mean a more or less acute inflammation of the tissues above or under the fascia, the "primus movens" of which is a set of local symptoms of lymphatic obstruction, and that's why, unlike other ordinary infections of the soft tissues, it is extremely important that the obstructed flow be treated in association with the usual antibiotic treatment.



Recent epidemiologic studies conducted by our team proved that approximately 1% of admissions to Emergency Departments (*Dipartimenti di Emergenza ed Accettazione* or DEA) in Italy are due to acute conditions of the lymphatic system.

In this case, approximately 80% of patients were admitted for acute or subacute lymphangitis, meaning dermal-hypodermal infections of different origins as complications of existing lymphatic obstructions, whether primary or secondary.

Compared with the dozens of millions of admissions to Italian emergency departments every year, the figures processed by our team strikingly show a high risk of misdiagnosis and medical malpractice, which delay the proper management and specific treatment of such severe conditions.



Actually, we insist, the acute cellulite symptoms that are specifically associated with a deficient lymphatic system are often confused with the symptoms of phlebitis or thrombophlebitis, and they are therefore wrongly treated with low-molecular-weight heparins only.

To have more accurate diagnoses, we have come up with a specific diagnostic "Score" (Lymphangitis Score), consisting of 8 simple anamnesticsemiologic points, in the attempt to help doctors reduce false negatives in their differential diagnoses.

Preliminary data about the medical application of such Score have shown it to be a highly sensitive Score (> 99%), which reduces false positives to statistically acceptable figures (< 4 %, if supported by blood and laboratory tests).

In patients where there is a medical-diagnostic suspicion, maybe supported by such Score, of a Lymphangitis or a Lymphangio-Adenitis, the obstruction in the lymphatic system that caused the immunodeficiency at the root of the inflammation must therefore be reduced, as well as delivering the usual broad-spectrum antibiotic treatment and a supporting symptomatic treatment.

Of all the parts of the combined treatment of lymphedema, the only one that can be applied to such cases to reduce the lymphatic obstruction is Multi Component Bandage.

This specifically means a strictly short-stretch elastic functional bandage (< 40% stretch), even better if worn with a zinc oxide or alginate dressing underneath.

Usually, patients perfectly tolerate a functional bandage, and failures are often due to wrong bandaging techniques or to the use of unsuitable materials.

Based on the medical experience gained in emergency and urgent surgery areas, poor compliance must lead us to look for subintrant co-morbidities or to change the initial antibiotic treatment, provided we are sure the limb has been properly bandaged.

Recently, for instance in wound care, new materials are being produced, such as medicated bandages, where the classic zinc oxide is replaced with a calcium alginate mixture (excellent for treating the exudate) and manuka honey.

Actually, while the topical use of antibiotics seems to be effective only to a limited extent, so that the antibacterial power of silver ions is preferable to the eutrophic power of such zinc oxide, preliminary data about the famously excellent antibacterial activity of manuka honey, occasionally associated with other watery substances, seem to be fairly promising.

When actual Lymphangitis occurs, unless a synergic effect is created between the systemic pharmacological treatment and the overall local therapy (designed to reduce the lymphatic obstruction), in most cases the inflammation will simply relapse, sometimes even very quickly.

In day-to-day medical practice, it is clear instead that the combined treatment of the lymphedema, even with bandages, dramatically reduces the typical infectious complications of such chronic patients.

QUALITY CONTROL IN LYMPHEDEMA THERAPIES

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Introduction: Outcomes of lymphedema treatment very seldom present results as excess volume or excess volume reduction. Instead circumference measurements, taken at random sites along the extremity, are used making it very difficult to estimate the true outcome as well as to compare various studies. Also continuous follow-up of treatment outcome is important.

Material and Methods: Volume measurement, either using plethysmography or based on circumference measurements, is an easy and quick method to objectively assess treatment outcome and to increase the scientific impact when presenting results.
The most reliable way to measure the volume of an extremity is plethysmography according to Archimedes' principle, i.e., the limb is immersed in a volume meter and the drained water is weighed. The weight in grams equals the volume in milliliter and also includes the hand and foot volume. For both the arm and leg volume meter it is important that the draining pipe is be placed high enough so that the entire limb can be measured. The diameter of the draining hose should be large so that the water can flow quickly. It is important that the limb is immersed into the volume meter at exactly the same depth each time.
Another method is circumference measurements on well-defined distances along the limb. The volume is calculated by the use of different formulas. Circumference measurements also provide information of the localization of the swelling. Hand and foot volumes cannot be calculated.
In order to follow the outcome of treatment Excel sheets have been constructed for easy use and data are directly linked to figures showing outcome.

Conclusion: To only make single circumference measurements (for example the middle of the upper arm, elbow, middle of the forearm) is not adequate either for clinical use or scientific study. Both plethysmography and circumference measurements are useful and show satisfactory validity and reliability. Plethysmography is recommended if only one method is used. Volume measurement of both extremities must be performed at the same time in order to get a reliable measure of the excess volume, which is the most important factor when evaluating outcome after any treatment. Long-term follow-up is made easy by the use of Excel sheets linked to figures. The volume measurement program can be downloaded here: https://lu.box.com/s/banyfpm988jr3u7oqd4e or www.plasticsurg.nu

Keywords: lymphedema, quality control, excess volume, treatment, plethysmography.

MANAGEMENT OF ULCERS IN LOWER EXTREMITIES WITH LYMPHEDEMA

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Ulcers and especially ulcers of lymphedema can be an important problem for the patient as well as for the health system. It is known that ulcers develop on a background of chronic venous insufficiency, obesity, occupation, low albumin, infection and etc. The patient with ulcer usually suffers from bleeding, pain, local or systemic infection. This chronic condition puts a severe financial, social and psychological burden on the patient and his family. That's why such wounds must be treated quickly in an attempt to promote fast healing of the ulcers and prompt symptomatic relief of the patient. The management of ulcers in patients with lymphedema is difficult and it depends mainly from the etiology of ulcers and the stage of lymphedema. Absorbent foam or alginate dressings should be used for exudating ulcers, and hydrocolloids reserved for sloughy, smelly ulcers. Moreover the use of antiseptics is important, sometimes antibiotics needed if signs of inflammation are present and surrounding skin should be protected with simple water based emollients. Manual lymph drainage is necessary in the lower extremities with lymphedema but the most useful measure in order to heal fast the ulcer is the compression bandage. Additional, sometimes we use vacuum assisted closure devises or pneumatic compression devices and drugs such as phlebotonic and diuretics.
Recurrence rates of ulcers after treatment are high. Once the leg ulcer is healed hygiene and careful skin care, strict use of compression hosiery must be emphasized and general recommendations such as physical therapy, elevated legs, drugs, lose weight, avoid any trauma are necessary for the prophylaxis of the lower extremities before the appearance of new ulcers.

EARLY DIAGNOSIS AND TREATMENT OF LYMPHEDEMA A RCT. STUDY PRELIMINARY

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Introduction: Highest risk for development of arm lymphedema (AL) occur among breast cancer patients treated with both axillary surgery and radiotherapy. Scanning of these patients 1 month after surgery and again 4 months after RT for early diagnosis and compression treatment has proven effective to maintain AL at a minimum in a 10-year follow-up and 80% of the patients never exceeded lymphedema relative volume(LRV) 10% (Johansson, 2010). A hypothesis was generated that slight AL could be treated only with self-care and no compression.

Methods: Slight AL was defined as (LRV)5-8% using water displacement method (WDM) and/or TDC ratio>1.45 for upper arm and >1.3 for forearm using MoisterMeterD. Fifty patients have been included, randomized to either no compression treatment (NCT, n=16) or daily treatment with standard compression sleeve ccl 1 (CT, n=14). Follow-up are made after 1, 2, 3, 6, 9 and 12 months.

Results: 35% were diagnosed with both WDM and TDC, 30% with only WDM and 35% with only TDC. The mean LRV for diagnosis by WDM was 6.7±1.3% and mean TDC ratio for upper arm was 1.62±0.2 and forearm 1.49±0.1. Twenty-six patients have passed 6 months follow-up. In the CT group (n=10) LRV has not increased in any patient. In the NCT group (n=16) there has been an increase of ≥2% LRV in 7 who therefore have started CT.

Conclusion: Preliminary results indicate that when early diagnosed, AL can be effectively treated by compression garment but is only needed for about half of the patients when LRV is ≤8% at diagnosis.

Plenary Session V
LYMPHATIC DISORDERS AND VASCULAR MALFORMATIONS IN PEDIATRIC

LYMPHATIC MALFORMATIONS IN NEWBORN

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Primary lymphoedema is defined as lymphoedema caused by dysplasia of the lymph vessels. It is usually congenital and genetically determined. It can be either isolated, so without manifestations in other tissues or outside the lymph vessels, or be part of a disorder that shows other signs and/or symptoms as well (syndrome). The distinction between isolated forms of lymphoedema and those that are part of a more generalized entity is not strict as it also depends on the detail of the studies in affected individuals to search for other characteristics next to lymphoedema. Primary lymphoedema in children can cause considerable diagnostic difficulties to clinicians and distress to parents. It is essential to obtain a rapid diagnosis and to implement correct treatment at the earliest opportunity. It is estimated that many physicians and surgeons will see less than 10 cases of lymphoedema in a year. It is therefore imperative that patients are referred at an early stage to a clinic with wide experience and expertise in diagnostics and treatment. Primary lymphoedema can also show in lymphangiectasia of internal organs. The increased knowledge regarding the aetiology and pathogenesis of inherited disorders involving the lymphatic system has offered further insight in lymph vessel formation in general. The approach to establish the diagnosis in the often complex and sometimes confusing lymphatic disorders can cause difficulties. It is suggested a general scheme to provide help in the diagnostic process that can be generally applied in disorders that go along with lymphatic malfunctioning.

MEDICAL THERAPY FOR LYMPHATIC DISORDERS IN CHILHOOD

JOCHEN RÖSSLER
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Lymphatic malformations (LM) are frequently diagnosed in the paediatric age group. The recently updated I.S.S.V.A. classification of vascular anomalies discriminates between common LM such as microcystic, macrocystic, and mixed subtypes and multifocal LM such as generalized lymphatic anomaly (GLA) and Gorham-Stout disease (GSD). Therapy of common LM is sclerotherapy or surgery; however multifocal LM seems to need medical therapy. Another important LM is primary lymphedema that is considered as primary dysgenesis of the lymphatic network and which is treated by conservative measures such as stockings and drainages. Especially establishing a medical therapy for multifocal LM in children and adolescents is extremely important.
GLA can affect the skin and superficial soft tissue and abdominal and thoracic viscera, and often involve bone, with bone disease that is generally nonprogressive and spares the bone cortical boundaries. Chylous effusions (pericardial, pleural, or peritoneal) can be present. GSD is characterized by LM affecting a single or multiple bones and often neighboring soft tissue, with a progressive osteolysis also affecting the cortical bone. GSD patients can also have abdominal and thoracic visceral involvement as well as effusions. Pathologic fractures may occur in both entities.
To date, there is no standardised medical therapy available. In single cases, stable disease and/or remission was achieved through treatment with glucocorticoids, pegylated (PEG)–interferon, bisphosphonates, tyrosine kinase inhibitors, bevacizumab or radiotherapy. Recently, the mTOR inhibitor rapamycine (Sirolimus) has been successfully administered in GLA and GSD patients. The results of molecular studies on LM with presence of mutations in molecules of the mTOR pathway have indicated a genetic background for this approach.

MANAGEMENT OF LYMPHEDEMA IN CHILDREN

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Medical treatment of lymphoedema in children has been mainly adapted from the one applied in adults. Few cases of surgical treatment have also been published. In both cases, the objectives of the treatment are unclear making any improvement of evidence very difficult to achieve. On the basis of observational studies and recent physiopathological knowledge gained from genetics studies, cornerstones of the treatment strategy regarding potential complications will be discussed.

LIPOMATOUS OVERGROWTH IN PEDIATRICS

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Biological growth is a result of trophia and plasia, which also means development of function. Morphogenesis is the development of shape. Normal growth is proportionate, harmonic, has limits, is regulated by growth hormones, insulin, thyroid and others, and the pondo-statural result is size. Excessive growth may mean gigantism, hamartomatosis, tumor... Growth has a limit, in space and time, after which cell replacement takes place --not possible in all tissues or scars, where cell replacement is the biological replacement of functionless tissues. In some clinical considerations, related to vascular syndromic aspects in pediatrics, hypertrophy means the constant participation of the skeleton, apart from other tissues like muscles, skin and subcutaneous cellular tissue. In pediatric angiology, the syndrome that expresses well all these phenomena is the osteo-hypertrophic varicose nevus, historically known as KTS, which expresses a three vascular system malformation too.
Venous hypertension due to truncular vascular malformation is expressed, among other things, as segmental hypertrophy of the body. Venous hypertension in extra-truncular malformations means in general hypotrophy. Lymphatic system hypertension that is expressed at the interstitial level does not involve the skeleton but means lipomatous overgrowth. The malformation of the lymphatic system at the level of the capillaries, for example lymphangiomatosis without lymphedema, may mean osteohypertrophy. Both primary and secondary situations may thus be expressed in the same way and involve the lymphatic and venous systems. All combined vascular syndromes – the big angiodysplasic syndromes- BAS- have important clinical, surgical, physical and psychosocial implications. Lipomatous overgrowth is one of this aspect, and has not been solved. It is a constant in primary and secondary lymphedema, as it is in syndromes with truncular venous malformation, generally without valves, and, as a result, with extreme hypertension. Truncular vascular malformations are normally associated with lymphatic system malformations --truncular or vascular (LAD I) and nodal (LAD II). Due to their venous (and arterial venous) origin they produce hypertrophy and due to their lymphatic origin they produce simultaneous primary and secondary lymphedema, and consequently, adipose overgrowth.
There is a group of patients, the largest one, with lipomatous overgrowth generally associated with hypertrophy of the skeleton with no vascular malformation and no syndromic definition. Their conditions are orphan disorders in pediatrics too, a true challenge when it comes to attempt a basic physical and psychosocial integration of these patients.
There are many situations of lipomatous overgrowth. Possibly, all of them are hamartomatosis. Summing up: 1. Tumors. without Vascular Malformations. 2. Lipodystrophy, with Vascular Malformations. 3. Lipomatous Overgrowth without vascular malformations. 4. Lipedema?

MEDICAL TREATMENT OF HEMANGIOMA IN CHILDREN

CATHERINE MICHEL, FLAVIENNE CHOUTA, HUSSEIN KASSEM YOUSSEF, HAMID NOJAVAN
Dermatology, GHR Mulhouse et Sud Alsace, Emile Muller Hospital , Mulhouse, France

Within a few years of the unexpective discovery of its spectacular effects on proliferating infantile haemangiomas (IH) in 2008, the nonselective beta-adrenergic antagonist propranolol has become the first-line therapy for complicated haemangiomas worldwide. This session will try to summarize the current knowledge about mechanisms potentially underlying the antiproliferative effect of propranolol in IH and will discuss the efficacy and tolerance of propranolol by showing own results in treated children.

Keywords: Haemangiomas, propranolol.

LYMPHATIC DISORDERS IN KLIPPEL-TRENAUNAY SYNDROME

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Klippel-Trenaunay syndrome (KTS) is defined as the association, mostly on the limbs, of a geographic capillary malformation, a venous malformation, a lymphatic malformation and overgrowth of the involved limb. KTS is part of the "PIK3CA related overgrowth syndromes"; KTS is then a slow flow vascular malformation, that should never be called hemangioma; it needs to be differentiated from Parkes-Weber syndrome which was considered to be close to KTS, but which is a high flow vascular malformation also associated with limb overgrowth and known to be related to RASA 1 mutation, in an inheritated pattern.
In KTS, symptoms are related to the different component of the complex anomaly: the venous component may be responsible for painful thrombo-inflammatory manifestations. Pulmonary thrombo-embolism is very rare and may occur when deep veins are distorted, especially in case of associated large pelvic enlarged venous channels. The limb overgrowth may be responsible for functional impairement because of inferior limb discrepancy. The lymphatic component is usually microcystic and infiltrating but may be macrocystic and is different from lymphoedema. It is responsible for inflammatory or infectious manifestations, swelling and ouzzing and sometimes bleeding. Treatment will be adapted on a case by case basis according to the severity of the symptoms. Compressive garment is most of the time required for equally venous and lymphatic reasons. Manual lymphatic drainage is also recommended, remembering that the increased size of the limb is not only due to the infiltrating lymphatic vessels, but also to soft tissue overgrowth. Anti-inflammatory and anti-bacterial agents are sometimes needed. Sirolimus which targets the signalling pathway involved in the pathogenesis of KTS appears to be highly efficient in the treatment of the lymphatic symptoms, reducing the frequency and the intensity of the inflammatory manifestations, and drying the superficial skin lymphangiectasia, improving symptoms, skin aspect and quality of life.

Keywords: Lymphatic malformation, overgrowth syndrome, klippel-trenaunay syndrome, PIK3CA related overgrowth syndrome, sirolimus.

Plenary Session VI
NEWS IN SURGICAL TREATMENT OF LYMPHATIC DISORDERS

NEWS PERSPECTIVES AND APPROACH IN LYMPHOEDEMA TREATMENT

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No one lymphedema is similar and the treatments must be adapted.
The evaluation by lymphoMRI help us to combine the map of the superficial and deep lymphatic system and the SPY imaging (percutaneous), the dynamic imaging.
The moderated iatrogenic lymphedema can be significantly improved by the lymphnodes transfers.
In the most severe cases, the dermolipectomies, advanced flaps combined by local liposculptures to reduce the tension of the scars are to be combined with lymphnodes transfers, in the same or directly second cession, depending the severity…
After 1 year, the evaluation by the LMRI and SPY allows to understand what is happening. In case of fat deposit and disappear of the honey combs, local
liposculptures can be achieved under the control of the SPY to avoid the destruction of the lymphatic vessels.
For the ankles, if some vessels are visible and the edema still local, combinations with lymphovenous anastomosis can be performed at the same time.
Introduction off collagen threats to the lymphnodes transplantation will perhaps help the growth of the lymphatic vessels.

UPDATE IN ONE SITE MLVA FOR PERIPHERAL LYMPHEDEMA

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Introduction: The author's vast surgical experience in the treatment of primary and secondary peripheral lymphedemas using microsurgical procedures at the Centre of Lymphatic Surgery and Microsurgery of the University of Genoa, Italy, is reported.

Objectives: The main objective is to describe the techniques and the long-lasting clinical outcomes based on 40 years of experience and research, with particular reference to advanced derivative and reconstructive lymphatic microsurgery at a single surgical site, which lowers the risk of infection and increases the patency of the anastomoses due to the use of larger caliber lymphatic vessels.

Method / Design: Over 3000 patients affected by upper and/or lower limb lymphedema, between 1973 and 2015, underwent lymphatic microsurgery. Derivative multiple lymphatic-venous anastomoses (MLVA) or lymphatic pathway reconstruction using interpositioned vein-grafted shunts (MLVLA) were performed at a single surgical site, either the axillary or inguinal-crural region. Patients were followed for a minimum of five years to over 20 years. Clinical outcomes included excess limb volume (ELV), frequency of dermatolymphangioadenitis (DLA) attacks, and use of conservative therapies.

Results: Compared to pre-operative conditions, patients obtained significant reductions in ELV of over 84%, with an average follow-up of 10 years or more. Over 86% of patients with earlier stages of disease (stages IB or IIA) progressively stopped using conservative therapies and 42% of patients with later stages (stages IIB and III) decreased the frequency of physical therapies. DLA attacks considerably reduced by over 91%.

Conclusions: MLVA or MLVLA techniques when performed at a single site produce excellent outcomes in the treatment of both primary and secondary lymphedemas, giving the possibility of a complete restoration of lymphatic flow in early stages of disease when tissue changes are minimal.

Keywords: Peripheral Lymphedema; Lymphatic Microsurgery; Multiple Lymphatic-Venous Anastomoses (MLVA, MLVLA); Single-Site Lymphatic Microsurgery.

REPLACEMENT OF OBLITERATED LYMPHATIC COLLECTORS IN OBSTRUCTIVE LYMPHEDEMA OF LOWER LIMBS BY SILICONE TUBING IMPLANT

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Background: The lymphatic structure of tissue is composed of the intercellular space and lymphatic vessels. The intercellular space is a network of billions of confluent microspaces. Tissue fluid flows from these spaces to the lymphatics. Obliteration of lymphatics, clinically recognized as lymphedema, brings about stasis of fluid with dilatation of the intercellular space. In course of time, large spaces or pseudo-channels are formed. Flow of fluid is hampered by hydraulic resistance of tissue and lack of propelling force. The question arouse whether decongestion of edematous tissue can be accomplished by implantation of artificial channels and application of external compression. **Aim.** To study the effect of silicone tubing implants replacing obliterated collecting lymphatics followed by external compression on edema fluid flow to the non-swollen regions. **Material and methods.** Study included 25 patients with lymphedema of lower limbs stage III and IV. Twenty patients developed edema after histerectomy and radiotherapy, 5 had infectious skin incidences in the past. Lymphoscintigraphy showed lack of flow of tracer from foot to the groin. Three medical grade hydrophobic silicone tubing o.d.3.2, i.d. 1.8 mm, perforated every 2 cm, were implanted subcutaneously from mid-calf to hypogastrium. Elastic stockings grade II and two weeks of intermittent pneumatic compression were then applied. **Results.** After 2-4 years the mean decrease in circumference in mid-calf was from 1.5 to 5 cm. No expulsion of implant was observed. In 2 cases inflammatory episodes at the hypogastric end of implant, controlled by amoxicillin, were observed. On lymphoscintigraphy tracer was seen in the tubings or around them. On ultrasonography accumulation of fluid around tubings could be shown. In some cases no flow of tracer was observed although there was its evident absorbtion. **Conclusions.** Silicone tubing implants in lymphedematous is a low-invasive effective method for decompression of obstructive lymphedema.

SURGICAL MANAGEMENT OF PRIMARY LYMPHEDEMA – OUR EXPERIENCE

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Background: To present a retrospectively study of surgical management of primary lymphedema in China.

Method and material: The published relevant literature in recent 50 years were collected and analyzed. Primary lymphedema is defined as edema caused by lymphatic dysplasia and/or dysfunction due to congenital or unknown factors. Patients with primary lymphedema exhibit diverse clinical signs. The Chinese surgeons have struggling for years for the treatment primary lymphedema and have tried a variety of surgical procedures including Charles' operation, Thompson's operation and micro-lymphatic procedures as lymph-venous shunting and lymph node transplantation as well. However the outcomes of surgical management of primary lymphedema are not satisfied. The number of operation treatment decreased year by year. The unsatisfied outcome of the surgical therapy is largely due to the fact that primary lymphedema is typically managed as a chronic lymphoedema without consideration of its background as a congenital vascular malformation. The pathology underlines primary lymphedema may be the malformation of lymph node only or simply lymphatic abnormal. This presentation introduces our experience and lessons of the surgical treatment of primary lymphedema.

LYMPHATIC VASCULAR GRAFTING: INVESTIGATIONS ON THE HARVESTING SITE

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Background: Lymphatic vascular grafting reconstructs an interrupted lymphatic pathway using the patient`s own lymphatic vessels. A benefit up to a normalization of the lymphatic flow has been shown. For this method harvesting of lymphatic vessels is necessary.

Objective: Aim of the study was to determine whether the extirpation of lymphatic vessels at the thigh, following the security guidelines induces disturbances of the donor limb.

Method: A total of 19 consecutive patients were pre- and postoperatively examined by lymphoscintigraphy. In order to quantify visual scintigraphic findings, a well established numeric transport-index of transport kinetics combining visual assessment of five criteria was applied.

Results: All patients underwent a preoperative scintigraphic baseline study and a postoperative scintigraphic follow up after microsurgical treatment. The mean time period from the baseline study to the date of microsurgical lymphatic vascular grafting was 3,5 months, the mean scintigraphic follow up was performed 48,6 months after the harvest and the grafting. In all patients the postoperative transport-index was in the range of the transport-index of the baseline scintigraphy and no pathologic transport-index was detected after the harvest.

Conclusion: The results confirm that harvesting of lymphatic vessels taking 2-3 lymphatic vessels out of about 16 of the ventro medial bundle at the thigh, following the security guidelines: normal preoperative scintigraphic lymphflow, stained lymphatic vessels always remaining at the harvesting site, harvest only between the lymph nodes at the groin and the bottle neck at the knee, is possible without worsening the lymphatic transport at the donor limb.

Keywords: lymphedema, lymphatic grafting, lymphoscintigraphy

THE SURGICAL LYMPHATIC CHALLENGE IN MALE GENITAL LYMPHEDEMA

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Lymphatic insufficiency (primary or secondary) of the external genitalia, leads in its chronic form to a clinical picture of lymphedema and/or lipohypertrophy and/or soft tissue fibrosis. Lymphatic insufficiency can be complicated by episodes of erysipelas, lymphatic verrucosis, lymphorrhea.
Detailed knowledge of the lymphatic drainage of the male external genitalia is the basic premise for a successful surgical procedure, both resectional and microsurgical procedure.
A microsurgical procedure creating a lympho-venous or a lympho-lymphatic anastomoses would be a causal treatment. Such an approach is rather sporadic because patients usually present in an advanced stage of the disease with a pittging lymphedema, fibrotic remodelling of the prepuce, skin of the penis and the scrotum, often affecting also the soft tissues of the pubic area, and sometimes with extensive verrucosis and lymphorrhea. In such cases, a resection is an optimal approach that improves all aspects of the quality of life of the patient. If a lymphatic reflux from lower limbs and/or the abdominal wall is found, an anti-reflux procedure with a lymph-venous anastomosis is appropriate.
"Tailoring surgery" is used in majority of cases of resectional surgery of the skin of the penis and scrotum to make a sufficiently radical procedure in a specific patient, to create a suture without tension and the risk of wound dehiscence, leaving external urethral orifice visible and ideally to restore or maintain sexual functions.
To create a new physiological lympho-venous shunt the authors recommend to use Jaboulay procedure (similar to the hydrocele surgery). The layers of tissue enclosing the testicles are incised and everted (even if a hydrocele testis is not present) to enlarge the resorptive area of the testicles (with sufficient lymphatic drainage) towards the tissues of scrotum (with lymphatic insufficiency). The testicles and the epididymis are due to their development drained into the nodi lymphatici paraaortales and paracavales. Tissue of scrotum and layers of tissue enclosing each testicle derived from the layers of the abdominal wall are drained into the nodi lymphatici inguinales.
The authors demonstrate their experience with surgical treatment of chronic penoscrotal lymphoedema, call attention to indications for surgery, particular steps performed during surgery and post-operative care.

Keywords: penoscrotal lymphoedema, surgery, lymphatic insufficiency.

NOVELTIES IN TREATING ADVANCED CASES OF LYMPHEDEMA

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Introduction: Peripheral lymphedema remains a poorly recognized disease that causes significant morbidity and chronic lymphedema is associated with fibrotic tissue changes and adipose formation ('non-pitting' edema) that is irreversible when untreated. Lymphatic Microsurgery provides a functional repair to overcome the obstacle in lymphatic flow. In these cases, lymphatic microsurgery helps to resolve the lymph-stasis that contributes markedly to swelling. Notwithstanding the success of the microsurgery, there often remains significant adipose tissue in the affected limb in advanced lymphedema, which contributes to residual lymph-stasis and increased risk of infection.

Objectives: The author discusses a recently developed Fibro-Lipo-Lymph-Aspiration technique to improve this chronic swelling, using a Lymph Vessel Sparing Procedure (FLLA-LVSP).

Method / Design: 146 patients with primary or secondary lymphedema already treated by derivative/reconstructive lymphatic microsurgery were included in this retrospective study. All patients had achieved significant volume loss after microsurgery but all had residual fibrotic/adipose tissue that was resistant to conservative treatments. Using microlymphography techniques to highlight the lymphatic pathways, the excess adipose tissue was carefully aspirated with the FLLA procedure.

Results: 0.80L on average for the upper limb and 2.42L for the lower limb were removed with the FLLA-LVSP. For the upper limb, there was an average pre-surgery excess volume of 20.19%, which reduced to 2.68% after the FLLA-LVSP (Z-score =-6.90, $p<0.001$). Similarly, for the lower limb, there was an average pre-surgery excess limb volume of 21.24% and a reduction to 2.64% post-operatively (Z-score=-3.57, $p<0.01$). No episodes of post-operative infection occurred.

Conclusions: The FLLA-LVSP is efficient. It is possible to complete an entire leg within 90 minutes. Recovery time is short and cosmetic results are immediate. More importantly, the removal of excess tissue is completed without further damage to lymphatic vessels providing evidence of the efficacy of FLLA-LVSP in limb-reshaping whilst maintaining the optimal lymphatic flow restored by Lymphatic Microsurgery.

Keywords: Advanced Lymphedema, Lymph Vessel Sparing Procedure (LVSP), Fibro-Lipo-Lymph-Aspiration (FLLA), Green Indocyanine Fluorescent Microlymphography.

Plenary Session VII
SPECIAL CASES AND COMPLICATIONS OF LYMPHEDEMA

LESION OF THORACIC DUCT: CLINICAL CASE REPORT

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Introduction: Chylous leakage is a relevant clinical problem after major abdominal or thoracic surgery. Literature report an incidence of chylous leakage of about 7%. An accurate diagnostic study is indispensable to plan the correct therapeutic approach. Surgical and interventional approaches are reserved for cases refractory to conservative treatment.

Clinical presentation: In July 2014, a 76-year-old male was diagnosed with locally advanced adenocarcinoma of the gastroesophageal junction. After chemotherapy, in November 2014 an Ivor Lewis esophagectomy was performed. After 1 month the patient developed a massive chylous ascites. Initially he underwent conservative treatments. An accurate diagnostic study with CT-lymphangiography (LAG-CT) showed the chylous leakage at the lower third of the thoracic duct. Different attempts of embolization of the chylous leakage were carried out but the ascites and the metabolic imbalance persisted. On February 2015, a laparotomic approach was performed and the chylous leakage was confirmed with a fatty meal and treated with non-absorbable suture material and platelet gel.

Results: The patient was followed up clinically and instrumentally (with echo-scan and TC) for 6 months postoperatively. Lab tests demonstrated a progressive improvement of the metabolic and immunologic conditions. No recurrence of chylous ascites appeared.

Conclusions: According to Authors' experience, LAG-CT represents the gold-standard in the diagnostic work-up in patients affected from thoracic duct lesions. Angio-radiologic approach is a valid solution but not always successful, especially for extensive damages of the thoracic duct.
The surgical approach remains the last therapeutic solution for chyloperitoneum refractory to non-operative treatment and more recently it is efficaciously associated with the use of platelet gel.

Keywords: thoracic duct lesion, chyloperitoneum, chylous ascites, chylous leakage, therapy.

INTESTINAL DISEASES AND LYMPHEDEMA, A RARE ASSOCIATION?

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Lymphedema may be very rarely associated with intestinal lymphangiectasia. Clinical features of lymphedema are specific. Lymphedema is less pitting than edema due to hypoproteinemia, and is localized to the lower limbs and predominantly bilateral. Upper limb with hand and forearm involvement, lymphedema of breast and external genitalia (with skin thickening) may also be present. In most patients with lymphedema, we also observed edema as a consequence of hypoproprotidemia. The two types of edema are not always easily distinguished. Stemmer's sign is an important element to confirm the diagnosis and differentiate lymphedema from edema. Primary intestinal lymphangiectasia is characterized by dilated intestinal lacteals resulting in lymph leakage into the small bowel lumen and responsible for protein-losing enteropathy leading to lymphopenia, hypoalbuminemia and hypogammaglobulinemia. Fatigue, abdominal pain, moderate diarrhea or fat-soluble vitamin deficiencies due to malabsorption may also be present. Exsudative enteropathy is confirmed by the elevated 24-h stool α1-antitrypsin clearance. Diagnosis of primary intestinal lymphangiectasia is confirmed by endoscopic observation of intestinal lymphangiectasia (eventually by videocapsule endoscopy) with the corresponding histology of intestinal biopsy specimens. A low-fat diet associated with medium-chain triglyceride supplementation is the cornerstone of medical management. Other inconsistently effective treatments have been proposed, such as octreotide. The low-fat diet is not effective on lymphedema volume.

PUFFY HANDS SYNDROME DUE TO DRUG ADDICTION

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Intravenous drug use can be accompanied by systemic and local complications. Intravenous injection of drug induced thrombosis, septic or embolic complications. Swollen hands or puffy hands syndrome is a little-known complication of intravenous drug abuse in the long term. We have reported several cases of patients, long-term addicts suffering from a syndrome of puffy hands. There are men and women (mean age around 30 years), drug addict for a long term (average 7 years), who stopped injecting heroin for 3 to 5 years and receiving or having received a buprenorphine substitution. The puffy hands syndrome had appeared 2 to 3 years after the drug using. Typically edema is bilateral affecting the dorsum of the hand and the root of the fingers extending towards the forearm. Edema affects the feet and legs in some patients. Edema was elastic with low pitting and not changed by the raising of the members. Venous ultrasound of the upper limbs was normal. Lymphoscintigraphy showed no progression of the tracer in a member for a drainage obstruction trunks. The syndrome of puffy hands would be the ultimate expression of lymphatic obstruction. The obstruction and the progressive destruction of the lymph trunks could result of the drainage of the impurities present in the drug when injected outside the vein. Hence, buprenorphine was supposed to play a role in the pathogenesis as it is often misused by addicts in intravenous injection. This drug is poorly soluble, and the drainage fragments of excipient during injections outside veins could explain the lymphatic obstruction. Though, repeated infections due to multiple use of contaminated needles play an important role too. Thus, injection malpractices more than buprenorphine misuse are likely to cause the puffy hands syndrome for which presently, there is no cure.

MANAGEMENT OF LIPEDEMA

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Lipedema is a frequently misdiagnosed disorder in women. Lipedema is characterized by bilateral enlargement of the lower limbs due to abnormal depositions of subcutaneous fat, associated with pain and bruising.
The onset is frequently related to puberty, and although some patients are overweighed up to 20% present with normal or low body mass index.
All the patients have bilateral and symmetrical involvement. Following our series, other features of lipedema syndrome are: 86% disproportion with upper part of the body; 90.3% spare feet; 92.5% pain; 88.2% bruising; 82.8% absence of Stemmer sign; 83.9% had vascular spiders; 91.4% were worse at night; pitting was positive in 15.1%. Coldness sensation was reported by 36.8%. Although Stemmer sign and lymphoscintigraphic abnormalities are typically associated to the diagnosis of lymphedema, and have been used traditionally to differentiate both syndromes, they are present also in lipedema patients.
In early stages, circular knitted pants, class 2, and aerobic exercise can be enough to control the heaviness, the pain and the increase of volume. Decongestive therapy can be necessary in some cases when a decrease in edema is expected, and the maintenance phase with flat-knitted garments. Liposuction is widely studied for patients with important volume and deformity, with the recommendation of wearing flat-knitted garments after it.

THE FALLACIES IN LYMPHOEDEMA A 30 YEARS EXPERIENCE

MANOKARAN GURUSAMY
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Lymphoedema is as old as human existence. Lymphatics system was identified much earlier than cardio vascular system.
The problem of Lymphoedema is debilitating, depressing and chronic in nature with an economic burden of 36 billion dollar as per WHO estimation.
I have been treating Lymphoedema of different aetiology. Each patient responds differently and it various from the genter, demography and culture.
After treating these patients from conservative management to debunking surgery to micro vascular surgery I found nothing works individually. A combined modality of MLD/CDD, Bandaging, pressure garments and local hygiene with periodic prophylactic antibiotics if necessary surgical intervention - a multi modality approach gives the best acceptable result. The progress of the disease is basically because of the secondary infection rather than the primary cause. All this will be explained with a power point presentation - my thirty years of treating these unfortunate patients.

INFECTIOUS COMPLICATIONS OF LYMPHEDEMA

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Erysipelas and skin mycoses are frequent complications of lymphedemas.
Erysipelas is a non-necrotizing bacterial hypodermal cellulitis due to streptococcal infection. The diagnosis of erysipelas is clinical, manifesting by first signs as sudden fever and shivering. The clinical aspect is an inflammatory plaque. It has been shown that entry lesions in the skin play a causative role. Clinical observations suggest that interdigital skin lesions of the feet, often assumed to be fungal, may be of particular importance. Treatment of erysipelas is mainly antibiotics per os (amoxicillin or pristinamycin), and adjuvant therapies are not justified.
The risk of recurrent erysipelas on lymphedema is high. The prevention of recurrence is mainstay. Since the first risk factor for recurrence of erysipelas is the presence of a lymphedema, the treatment of lymphedema and its risk of occurrence must be considered. This includes physiotherapy, well-adapted compression therapy. It has been proved that complex decongestive physiotherapy decreases risks of recurrence. Prophylactic treatment includes skin care, particularly treatment of injuries and intertrigos, and avoidance of wounds. A prophylactic treatment with penicillin is sometimes requested as soon as the first recurrence.
Hyperplastic skin leads to maceration and then mycoses.
Fungal interdigital involvement is associated with cracking/fissuring of the skin. In lower limb, tinea pedis and onychomycosis were found to be significantly associated with lymphedema. They are readily amenable to treatment with effective topical (or topical + systemic for onychomycosis) therapy. In lymphedema, because it is a risk factor for erysipelas of the leg, interdigital tinea pedis must be eradicated.

Plenary Session VIII
IMAGING IN LYMPHOLOGY

NEW HORIZONS IN LYMPHATIC IMAGING WITH US

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Objectives

– Recognize the normal appearance on US images of the lymphatic network of the skin
– Identify the elementary signs in lymphatic pathology

Summary

The hypodermal and epi-aponevrotic lymphatic network of the skin is visible with high-frequency ultrasound realized without pressure onto the probe. Its architecture follows the septations of the adipose lobules. The lymphatic flow is oriented by numerous valves and acts in suppliance of the veinous flow to prevent edema.

Lymphatic vessels can dilate and their lumen become visible, they can get infected and their content become echogenic, or be thrombosed and become incompressible.

INDIRECT LYMPHOGRAPHY IN LYMPHOLOGY

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Since Asselius incidentally discovered the lymphatic system in 1622 and Harvey (1628) published his completed treatise on the circulation of the blood, it has been a long quest to gain as much knowledge as possible about these tiny structures.
Indirect lymphography started when Pecquet (1649) successfully used subcutaneous or intramuscular injections of mercury into cadavers and described the cisterna chyli. All progresses in the knowledge of the descriptive anatomy of the lymphatic system were made using the same approach with different dyes.
Malpighi (1661) injected in cadavers colourless or coloured preserving fluids composed of alcohol, mercury, different metals (including lead, tin, bismuth) and wax. Using this method developed to obtain anatomical preparations, Mascagni (1787) published the first complete description of the lymphatic system and developed wax models of the human lymphatic system which are still visible in Bologna. It was possible to see the lymphatic vessels.
Then Sappey (1872) have used Prussian blue, a toxic dye, injected into the vessels and the dermis of cadavers. It was the true beginning of the application of indirect lymphography for regional anatomical studies.
Stiles (1892) described the lymphatic system of the breast with the same method, which will be modified later by Gerota (1896) and used by Rouvière (1928) who will publish a completed treatise the lymphatic system.
From 1920 to 1950, a lot of studies using pre-mortem injection of different dyes as cresyl blue, indigo carmine or carbon particle have complemented the knowledge acquired during one century.
A new era began with Servelle (1944) with the clinical use of vital dye in lymphedema. After a dermal injection of patent blue it was possible to visualize the corresponding lymphatic vessel or a lymphostasis.
Kinmonth (1952) has the idea to cannulate a lymphatic vessel of the foot visualized with this method and he developed the direct lymphangiography.
Concurrently the first attempts for the identification of regional node by means of vital staining during surgery with patent blue violet, blue sky pontamine and finally Evans Blue were carried on in gastric cancer. As adverse reactions were frequent, inert substances as India ink, fluorescent dye in ultraviolet light (Schlegel 1949) or radioactive particles were suggested to visualize the superficial lymphatic network and their corresponding lymph nodes. Indirect radioactive lymphography was developed, successively with colloidal 198Au, 131I or 111In albumin particle and finally with 99mTc radiocolloids.
As this method is unable to give precise information on the superficial lymphatic network, a microlymphangiography using fluorescent dye was developed by Bollinger (1981) while Parstch was working on an indirect RX lymphography with a contrast medium (Iotrulan®). However, lymphoscintigraphy has become the standard method for the assessment of the lymphatic system including pre and per surgical detection of the sentinel node.
Since nearly 10 years a new indirect lymphography using indocyanine green injected intradermally is under evaluation. It is a very promizing way for studying lymphatic microcirculation and detecting lymphostasis at a preclinical stage.

INTEREST OF THE LYMPHO-SPET-CT IN THE MANAGEMENT OF EDEMAS

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In the framework of his (short) lecture, the speaker will present and illustrate the interest and the indications of the lympho-SPECT-CT investigations (in addition to his conventional 3-phase approach) for the management of the patients with upper and lower limb edemas.

Among others, will be showed the interest of these investigations for:

– The demonstration and differentiation between the deep and superficial lymphatic (nodo-vascular) pathways at the level of the limbs, of the axillas and chest and of the pelvis, with their implications for the physical therapists and surgeons.
– The definition of the "nature" (lymphatic or not) of some activities observed in unusual areas on planar imagings.

NOVELTIES IN LYMPHOSCINTIGRAPHY FOR LYMPHATIC DISEASES

GIUSEPPE VILLA
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Lymphoedema is a relatively common chronic disease, caused by ineffective lymphatic transport that results in edema and skin damage. Lymphoscintigraphy is a simple and noninvasive functional test for the evaluation of the lymphatic system, allowing an early diagnosis, essential in preventing the progression of the disease and its complications. Therapy is often delayed without a proper diagnosis. Early treatment often results in rapid clinical improvement and prevents progression to the chronic phase of the disease. Lymphoscintigraphy offers an objective and reliable approach to diagnose and characterize the severity of lymphedema and to differentiate lymphatic from venous edema, myxedema, lipedema, or other etiology. It is also used to identify sentinel nodes in melanoma, breast cancer and other malignancies. Injection of radiolabeled tracers with subsequent gamma camera monitoring has been used to study the lymphatic system since the 1950s. The method has largely replaced the more invasive technique of lymphangiography. The protocol for lymphoscintigraphy is not yet standardized. Differences include the choice of radiotracer, the type and site of injection, the use of dynamic and static acquisitions, and the acquisition times. A recent consensus meeting, held in Milan, proposed to inject 30 MBq of technetium 99m-nanocolloid subcutaneously into the interdigital spaces and subfascially, in order to explore respectively superficial and deep lymphatic circuits. The suggestion is to perform the study of the two circuits in different days. Total body images have to be recorded after 20 minuts, 1 and sometimes 4 hour from the injections; tomographic acquisitions (SPET) allow a better anatomical definition of the lymphatic structures. A moderate physical stress is mandatory during the test, mainly before delayed acquisition.

Criteria for lymphatic dysfunction include delay, asymmetric or absent visualization of regional lymph nodes and presence of dermal flow. Additional findings include asymmetric visualization of lymphatic channels, collateral lymphatic channels, interrupted vascular structures, and the presence of deep lymphatic nodes (popliteal or troclear lymph nodes). In some cases a further injection beyond the obstacle may be useful to assess the patency of the proximal lymphatic pathways.

Qualitative interpretation of the images is very observer dependent and mild lymphedema can be missed. Quantitative lymphoscintigraphy, where the lymph transport capacity is being estimated, offers an objective measure for lymphatic function and has been shown to have higher sensitivity and specificity.

IN VIVO IMAGING OF THE LYMPH VESSELS AND CHANGES OF THE LYMPH FLOW IN OBESITY

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Near-infrared (NIR) imaging is an emerging and promising tool for non-invasive in-vivo imaging of the lymphatic vasculature. As shown in patients with lymphedema and animal knockout models lymphatic vascular defects and the lack of dermal lymphatic capillaries can result in adipose tissue accumulation, which suggests a link between lymphatic dysfunction and adipose tissue accumulation. However, due to paucity of imaging techniques the effects of adipose tissue accumulation on lymphatic function are widely unknown. With a new developed near-infrared (NIR)-Imaging protocol we studied changes of the lymphatic vasculature-collecting vessels and lymph capillaries- in a model of diet induced obesity in mice. Obesity was induced in mice by high-fat diet (HFD) and lymphatic function of obese mice was compared to chow fed controls with NIR-Imaging. Compared to the controls all HFD mice developed changes in collecting vessel morphology with tortuous collecting lymphatic vessels below the knee region. Functional in vivo NIR-fluorescence assessment of the lymphatic vasculature, applied by mechanostimulation of the foot resulted in irregular pulsing and a weaker reaction to mechanostimulation in lymphatic collectors of the HFD mouse hind-legs. A decreased spreading of NIR-tracer in lymphatic capillaries was detected in K14-VEGF-C mice compared to wild-type mice. Together, these findings indicate that accumulation of adipose tissue in obesity impairs at least in part lymphatic function.

NON- CONTRAST MAGNETIC RESONANCE LYMPHOGRAPHY

LIONNEL ARRIVÉ

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Non-contrast MR lymphography uses very heavily T2-weighted fast spin echo sequences which obtain a nearly complete signal loss in tissue background with specific display of lymphatic vessels with a long T2 relaxation time. The raw data can be processed with different algorithms such as maximum intensity projection (MIP) algorithm to obtain an anatomic representation. Standard T2-weighted MR images easily demonstrates the location of edema. It appears as subcutaneous infiltration of soft tissue with a classical honeycomb pattern. True collection around the muscular area may be demonstrated in case of severe lymphedema. Lymph nodes may be normal in size, number and signal intensity, in other cases lymph nodes may be smaller or number of lymph nodes may be restricted. MR lymphography allows a classification of lymphedema in:

– Aplasia: no collecting vessels demonstrated;
– Hypoplasia: a lower number of lymphatic vessels;
– Numerical hyperplasia or hyperplasia with an increased number of lymphatic vessels of greater and abnormal diameter.

Non-contrast MR lymphography is a unique non invasive imaging modality for the diagnosis of lymphedema. It can be use for positive diagnosis, differential diagnosis and specific evaluation of lymphedema severity. It may also be used for follow-up evaluation after treatment.

SESSION IX
FREE COMMUNICATIONS I

LYMPHOSCINTIGRAPHIC ASSESSMENT OF THE MANUAL LYMPHATIC DRAINAGE (MLD) IN PATIENTS WITH UPPER LIMB LYMPHEDEMA (ULL): PRELIMINARY RESULTS

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Introduction: MLD is an important technique used in the treatment of lymphedema. It is a slow, rhythmic and light massage technique applied in the direction of the physiological lymphatic drainage. This physical treatment aims to stimulate lymphatics and to decrease the oedema. The purpose of this study is to evaluate the effectiveness and to quantify the effects of the MLD in patients with ULL by using lymphoscintigraphic approaches.

Material and Methods: A series of (to date 11) patients who had undergone a lymphoscintigraphy of the upper limb at the Jules Bordet Institute were selected to participate to the study. After the phase 3 of the exam, a MLD of 15 minutes was performed on the edematous arm and imagings were taken right after. The quantification was made on the imagings of each phase following the MLD, on each area of interest appearing (axillary and intercalated lymph nodes, areas of lymph stasis in "dermal backflows").

Results: Although preliminary, the results show that MLD trend globally to fill the lymphatic nodes by increasing the lymphatic flow in the same way as muscular activity does but probably with a different intensity. On the contrary, MLD trends to drain the dermal backflows and muscular activity trends to "increase" these dermal backflows.

Conclusions: MLD is able to increase the lymphatic flows, facilitating the drainage of the lymphedema. More patients will be needed to obtain statistical differences between the augmentation of the flow in the lymphatic nodes due to the muscular activity or to the MLD.

"INGUINAL LYMPH NODES VEINS", THEIR RELATIONSHIP WITH RECCURRENCE VARICOSE

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Introduction: Saphenectomy is one of the surgical procedures used to treat the great saphenous vein insufficiency, but it's associated with a high recurrence rate. It is known that the section of the tributaries of the arch of the great saphenous vein disturb the venous and lymphatic drainage of the inguinofemoral region. In recent years, the lymph nodes veins have been studied as one of the causes of recurrent varicose.

Material and Methods: 15 (n=15) human cadavers, 11 adults and 4 fetuses were used. Cadavers were subjected to injection procedures with colored latex then fixed in an aqueous solution of formalin 5% v / v. In 3 of the fetuses a lymphatic injection with Gerota technique with subsequent Spatelholz diaphanization method was performed. Then we dissected and photographed.

Results: The topography of the inguinofemoral lymph nodes veins, its frequency and relationships with the veins of the great saphenous vein arch is exposed.

Discussion: Lymph nodes veins drain in the veins corresponding to the arch of the great saphenous vein. The section of these veins, during surgery, disrupts the venous drainage of the lymph node generating subcapsular venous ectasia, a fact that is now considered as a possible cause of varicose recurrences.

Keywords: lymphonodal veins, inguinal lymphnodes, varicose recurrence.

DEEP INFRARED IMAGING: AN ORIGINAL METHOD TO IDENTIFY VENOUS IMPAIRMENT AFTER AXILLARY LYMPHNODE DISSECTION

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Introduction: Axillary lymphnode dissection (ALND) has as a consequence the reduction of lymph flow transport capacity, that may lead to a secondary lymphedema. ALND is necessary but not sufficient to develop a secondary lymphedema. Previous ultrasound studies show that half of the patients suffering from a secondary (ALND) lymphedema show also an ipsilateral axillary vein impairment.
Deep vein flow reduction is commonly counterbalanced by an increase of superficial venous flow and the development of a collateral network. In order to highlight rapidly the presence of eventual venous superficial collateralization pathways in routine follow-up, we developed an original, cheap and easy procedure, based on a deep infrared imaging (DIRI) device.

Material and Methods: The study includes two groups of 50 women: the control group is composed of healthy women and the second group is composed of ALND patients. All subjects were submitted to a thermogram of the anterior thorax. The 100 thermograms were mixed and analyzed by 3 independent and blind operators. In one hand they compare the mean temperature of each hemi thorax and on the other, with the help of an analysis grid, they note the presence and the direction of higher temperature lines which may result from superficial venous collateralization traces.

Results: The hemi thorax thermogram comparison shows that 100% of healthy women do not surpass a difference of 0,3°C but 64% of women from de ALND group have a difference over 0,3°C with a maximum of 1,25°C. Our scoring analysis grid, based on 8 items, does not show false positive but 16% false negative results. Coupling both methods, all patients were extracted from the 100 thermograms. False negative results, only in the patient group, are correlated with ALND patients with secondary breast cancer lymphedema (BCRL).

Conclusion: In patients with BCRL, analysis of the thorax thermogram, coupling a qualitative and a quantitative method, seems to be specific and sensitive enough in daily clinical practice for the screening and evaluation of patients with a suspicion of hemodynamic changes of the axillary vein.

LIPOEDEMA: USEFULNESS OF LYMPHOSCINTIGRAPHY

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Introduction: Lipoedema is a chronical disproportionate, symmetrical fatty distribution on the legs of unknown etiology with pain, orthostatic oedema, frequent haematomas associated, and sometimes involving arms. It affects women above all and brings a reduction in quality of life as well as psychological problems. The diagnosis of lipoedema is clinical, but in this study the author decided to request lymphoscintigraphy exam to analyze the morphological and/or functional features of the lymphatic system.

Objectives: In this study the author has planned to include in the study the lymphoscintigraphy exam to analyze eventual presence of lymph flow impairment in patients affected with lipoedema.

Method/Design: 60 patients affected by lipoedema of the lower limbs were evaluated through a clinical examination that led to differential diagnosis versus obesity and lymphoedema, as well as to 3 clinical stages. Furthermore a lymphoscintigraphy exam (bilateral subcutaneous injections in bilateral interdigital spaces of 99mTc nanosized colloids -185 Mbq) was required in all patients.

Results: The results of lymphoscintigraphy exams were analyzed within each clinical stage:
- 29 stage I: a normal radiotracer flow was noted in 34% of the cases and a morphological and/or functional abnormality in 66% of the cases,
- 23 stage II: a normal radiotracer flow was noted in 13% of the cases and a morphological and/or functional abnormality in 87% of the cases,
- 8 stage III: the morphological and or functional abnormality was highlighted in all cases.

No lymph-nodal alteration was noted in every clinical stage.

Conclusions: In this study in progress, lymphoscintigraphy exam has highlighted how significant the presence of lymph flow impairment is in each clinical stage.
The detection of alterations of the lymphatic system, with no apparent clinical evidence, is important in order to decide adequate conservative care to prevent evolution.

Keywords: lipoedema, lymphoscintigraphy.

TACKLING EDEMA OF THE BREAST – A NEW CONCEPT OF COMPRESSION BRA

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Introduction: Breast-conserving surgery followed by radiotherapy is a safe and effective procedure to treat patients with early stage breast cancer. However, some patients will be troubled by breast edema. Hereby, the breast size increases, sometimes with more than one cup size. Currently, there is no consensus on the definition of breast edema and standardized assessment criteria are lacking; therefore the reported incidence varies widely among studies (range: 0 - 90.4%). Nevertheless, this morbidity should be treated.

Objectives: To develop a new concept of compression bra to prevent and to treat breast edema.

Method: First, patient and caregiver (physiotherapist; surgeon) interviews were undertaken to define the key features of the new bra. Second, a new concept of compression bra was developed based upon a mathematical model. To design this model the "marvelous designer" software was used. This software enables to draw patterns and demonstrates the patterns' pressure on an avatar. The model incorporated the features of the different fabrics as well as different cup sizes and delivered pressures to the breast. Last, a prototype of the bra was made and tested by a volunteer. During the developmental stage, the European guideline 93/42/EEG (14/07/1993) for medical aids was respected.

Results: The feedback from the interviews can be summarized as follows: 1) patients understand the physical properties of the bra but would like a fashionable appearance; 2) the bra needs a closing at the front instead of the back; 3) shoulder straps need to be wide; 4) if necessary, pressure should be adjustable.
The model demonstrated that pressures delivered to different areas of the breast was within the range of 8-36 mmHg. It is more difficult to provide sufficient pressure to small cup sizes than larger cup sizes.

Conclusions: The new concept provides sufficient arguments for the clinical testing of the bra.

Keywords: Compression; Breast; Breast Neoplasms, Lymphedema.

MAGNETIC RESONANCE IMAGING SHOWS INCREASED CONTENT OF EPI- AND SUBFASCIAL FAT, AND SUBFASCIAL MUSCLE TISSUE/WATER IN ARM AND LEG LYMPHEDEMA

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Introduction: Lymphedema is a common complication after cancer treatment. The excess volume has been shown to consist mainly of epifascial adipose tissue and can be removed with liposuction. The presence of excess fat also in the subfascial compartment has not yet been investigated.

Objectives: The fat and water content was quantified using magnetic resonance imaging and chemical shift-based fat quantification.

Method: Seven patients with arm lymphedema (median 1239ml) and six patients with leg lymphedema (mean 4183ml) were examined with MRI before and after liposuction at 4 days, 1, 3, 6, and 12 months. Three slices were acquired at eight echo times with voxel size 1.6 x 1.6 x 5 mm3 and fat and water fraction images were reconstructed using a linear least-squares algorithm. Fat and water volumes were calculated within each of the epifascial and subfascial compartments.

Results: The excess volume was completely reduced by liposuction. Epifascia: The fat volume was significantly reduced after liposuction. A significant reduction in water volume was seen at 12 months. At 12 months, a significantly smaller fat volume and larger water volume compared to the healthy side remained. Subfascia: A significantly larger fat volume was seen at all time points. No significant difference in water volume (including both muscle tissue and edematous fluid) between the edematous and healthy sides was detected at any time point, but a significant reduction of the water volume was seen at 3 and 12 months.

Conclusions: Lymphedema is associated, not only with excess epifascial fat and water, but also with excess subfascial fat and water. The postoperative reduction of subfascial water volume may represent a decrease in muscle volume caused by less mechanical load after liposuction. The excess subfascial fat volume, however, remains one year after surgery since liposuction, for obvious reasons, is not performed in this compartment.

Keywords: lymphedema, liposuction, adipose tissue, fat, MRI.

PHYSICAL TREATMENT OF OEDEMA OF THE UPPER LIMB: THE LEADING PART OF MANUAL LYMPHATIC DRAINAGE (MLD)

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Introduction: Most of the authors considered in the past and still consider that the reduction of the volume of the swelling is the first aim of the treatment. This is of course one of the first expectations of the patient but it cannot be the fundamental purpose of the treatment. It is clear that edema is due to an insufficiency of the lymphatic system and oedema is the sign of this insufficiency.
If we limit ourselves to the treatment of the symptom, the risk of recurrence will be greatly increased. It is thus necessary to reconsider the treatment and to focus it to the underlying pathology itself. For many years researchers have been interested in this concept and some of them have tried to surgically construct new lymphatic pathways.

Objectives: Our objective with these studies was to investigate how with specific MLD treatment, we can open new lymphatic pathways.

Metho and Results: The description of the development of supplementary lymph pathways after lymph node dissection has been the subject of animal studies. The inner aspect of the anesthetized laboratory mice has been examined by means of trans illumination microscopy in vivo according to the technique of Knisely. The venous drainage of the anterior side of the skin is realized from the anterior medio thoracic region towards the corresponding axillary regions described by Sappey. The unilateral injection with Patent Blue shows us the venous and lymphatic pathways toward the corresponding axillary region. We performed a unilateral adenectomy in 10 animals (laboratory mice) which interrupted the lymphatic and venous return. After injection of patent blue, the blue dye is drained by the vein and the lymphatic collectors to the homo-lateral axillary region. The lymphatic drainage is organized also by means of a reflux (back flow) in the form of a rich network that ends in the medio thoracic region. In all cases (100% in 10 mice), starting from the medio thoracic region, the lymphatic network results in 1 or 2 lymph collectors draining the injected dye towards the contra lateral axillary region. This study shows the possibility to cross over the anterior thoracic region and shows the draining possibilities towards the contra lateral side in animals. We also conducted an anatomical study on 300 humans, no operated for breast cancer, in order to check for the existence of contra lateral lymphatic transfers. We found that the vessels that drain the arm without passing through the axillary lymph nodes are very frequent. We found these patterns at the anterior as well as the posterior part of the trunk. At least, we visualized the collectors draining to the contra lateral axillary region in patients operated from breast cancer. These same results were also published by one of our former students.

Conclusion: The physical treatment of edema has absolutely to take into account the fact that when lymph nodes have been removed, alternative drainage pathways do exist. The function of these derivative pathways must be activated and facilitated. The MLD technique stimulates the opening and the function of these supplementary vessels. The MLD plays, in this way; a fundamental role in the physical treatment but also in the pure medical definition of the treatment which means development of new pathways to diminish the risk of its recurrence and of complications. These local drainage pathways have first been found in an animal model, then anatomically investigated in humans and confirmed in patients suffering of edema after breast cancer surgery.

Conclusion: It is without any doubt clear that the objective of the Physical Treatment, according to our concept, has a double focus. The first focus is to reduce the volume of the edema and alleviate the symptoms of the disease. The second focus consists in the stimulation of newly activated patterns which will guide the drainage toward other intact regions. These supplementary lymph vessels offer great new treatment opportunities for draining the edema towards intact lymph nodes. By doing so, we treat the lymphatic insufficiency, and we prevent the frequency of recurrence of the oedema after the treatment has been completed. It is clear that MLD is the leading part of the physical treatment of oedema.

Keywords: oedema, derivative pathways, physical treatment.

SEVER LYMPHOEDEMA AND ITS COMPLICATIONS: BARRIER OR PROFESSIONAL CHALLENGE

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Particular cases of lymphoedema, very often, when must be decided the most proper therapeutic choices, put all the involved professional operators in front of fears of failure. This because our common knowledge on International Guidelines or on historical statements transmitted us by our great masters of lymphology could lead us to a position of docility in front of some patients with severe lymphoedema. We mean that could be easy, for example , foresee a therapeutic failure in a paraplegic patient in which the lower limbs paralysis unmasks a late primary lymphoedema. Another example could be the case of patient with a strongly positive lymphoscintigrapy with great leaks both in superficial and in deep lymphatic circulation in which poor therapeutic results are expected to be the certainty. And the genital elephantiasis too, in which there is a very big problem in therapeutical approach. Indicative is the case also of a patient with a post mastectomy large arm with a complete paralysis of it due to a past massive radiotherapy that destroyed completely some functions of brachial plexus. In these cases the inducement to analyze as deep as possible the only operative possibilities on each patient to identify what, notwithstanding the apparent barriers, allows the Team to enlarge their knowledge through the utilization of not usual or unconventional therapeutic tools under the lymphological point of view. This presentation will describe some particular cases with primary and secondary lymphedema of the limbs that presented, over then a severe staging (from 3rd to 4th one) different severe implications coming from neurologic damage up to orthopedic or venous and/or cutaneous ones. The “take home message” is that every lymphoedema can always, less or more, improve only if there is presence of a real lymphatic lack of balance and the Team is mentally open to individuate the real needing of every patients and everything that can be borrowed from other aspects of rehabilitation.

UNEXPECTED SUBSTITUTION LYMPHATIC PATHWAYS AFTER RAT'S AXILLARY NODES DISSECTION

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Introduction: It is difficult to create a chronic lymphoedema after Axillary Nodes Dissection (AND) without additional chemical inflammatory drugs or physical technique applications on animal models. However, according to other authors, "Lymphatic Fluid Stasis" (FLS) due to AND only seems to be the acute departure of the first tissue changes inducing a secondary lymphoedema on animal.

Objective: The aim of this study is to appreciate the morphological effects of AND on the rat's front leg and to detect FSL in the subcutaneous tissue and Functional Substitution Lymphatic Pathways (FSLP).

Methods: Left superficial and deep AND was performed on 30 females Wistar rats with a new posterior surgical approach. Volume changes of two front legs were appreciated 12 weeks after surgery by pressure variation assessment of water displacement during legs immersion. Indocyanine Green mapping was performed to detect LFS and FSLP after skin dissection.

Results: 43% of rats showed only a regeneration of interrupted lymphatic pathways. 27% showed only FSLP connected to the deep lymph vessels by perforating lymph vessels, while 30% of animals present the two phenomena. In all cases, FLS was not detected. Statistical difference (p=0.0350) of pressure variations (mmHg, mean±sd) between operated (0,4014 ± 0,05338) and non operated (0,4300±0,04513) sides was found. This result indicates there is not an increase of the operated front leg volume compare to the non operated leg.

Conclusions: Contrary to the hypothesis submitted in the literature, rat's AND does not necessarilly induce after 12 weeks a LFS considered as the first pathological event that leads to a secondary lymphoedema. Lymphatic pathways regeneration and FLSP, especially "perforating vessels" in the rat, seem to be the key to prevent LFS. This type of substitution pathways after AND on rat has never been described in the literature before.

Keywords: Axillary nodes dissection, substitution pathways, rat, perforating vessels, ICG.

EFFECTIVENESS OF FOLLOW UPS ON PERSISTENCE OF LYMPHEDEMA REDUCTION FOLLOWING HOME BASED COMPLETE DECONGESTIVE THERAPY: AN INDIAN EXPERIENCE

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Introduction: Arm lymphedema is a significant consequence of breast cancer treatment. Lymphedema is best managed with complete decongestive therapy (CDT). Regular and prolonged follow ups with the rehabilitation professionals is required for patients' motivation and timely guidance with CDT.

Objective: To investigate the effects of compliance with prescribed follow ups on persistence of lymphedema reduction following home based CDT in breast cancer patients.

Methods: A retrospective review of 54 breast cancer patients with unilateral arm lymphedema after axillary dissection with/without nodal radiation therapy was performed. Patients were divided into two groups according to the compliance with the prescribed follow ups. Group I, 24 patients, compliant with follow up visits. Group II, 30 patients, noncompliant with prescribed follow ups. Both groups were taught CDT phase I management for 1-2 weeks. Patients then administered home based CDT I for 4-8 weeks followed by CDT II (home therapy). Group I and II were followed for 20 and 14 months respectively.

Results: In group I mean percent excess volume (PEV) before CDT was 29.99% and 13.28% at 20thmonth suggesting significant edema reduction. At the end of CDT, PEV for group I was 13.54 which was significantly lower than the base line. The mean PEV in group II at base line was 17.48% and at 14th month was 14.65% suggesting no significant difference. Patients with initial mean PEV more than 20% showed significant reduction than the patients with initial mean PEV less than 20%.

Conclusion: Patients who complied with prescribed follow ups continued to show significant reductions till 20th month. Patients who did not comply with the necessary follow ups showed significant reductions till 6 months.

Keywords: Lymphedema, Complete Decongestive Therapy, Follow ups, Compliance.

VALUE AND LIMIT OF TREATMENT OF LYMPHEDEMA IN CONSULTING ROOM

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Lymphedema is a chronic disabling disease that affects approximately 10 millions of peoples in Europe. If not treated properly evolves towards a chronic form highly disabling; A proper and timely physical therapy can afford good living conditions to the patient, avoiding the evolution to the chronic form; the most useful is the physiotherapy, but must be set in accordance with appropriate protocols in specialized facilities and appropriately trained professionals. The actual therapeutic offer is largely insufficient. International studies have shown that a therapeutic approach to lymphedema, in brief hospitalization and intensive protocol, is often able to provide equivalent or better results than the outpatient management of the disease. Most of qualified International centers base their treatment approach of a hospital stay of 2-3 weeks, once considered by many authors as the most appropriate means to obtain tangible results. For these reasons, in repeated circumstances it will be necessary the hospitalization of some patients at the hospital for a physical and more intensive medical treatment, as well as for the completion of the diagnostic and clinical aspects themselves. Finally, in clinical cases less demanding an outpatient approach would be sufficient (as well as for the stabilization of the results achieved with intensive treatments) to 'personalize' both with respect to the individual treatments that for the times and frequencies of the same therapies, with minor discomfort and less individual social costs and benefits. The advantages of a dense branch network outpatient are designed to satisfy the great demand from the users and the need for immediate offer by the sanitary system with motivated staff (but often inexperienced). The limits of the health care facilities in consulting room it can be any little technical knowledge on the part of operators care, limited resources, lack of planning, time constraints, partial application of the methods particularly care of patients compliance and the right choice of elastic compression, no follow up. So desirable are the opportunities represented by the training for the ambulatory healthcare personnel (with application of the guidelines) in order to avoid abandonment of rehabilitation projects also due to low perceived quality.

Saturday, May 14th, 2016 - Amphi Bleu

Session IX
FREE COMMUNICATIONS II

INFLUENCE OF A MULTIDISCIPLINARY REHABILITATION PROGRAM ON BREAST CANCER RELATED LYMPHEDEMA AND QUALITY OF LIFE

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Introduction: Breast cancer related lymphedema (BCRL) is one of the most common and debilitating complications following breast cancer treatment. The influence of a multidisciplinary rehabilitation program on BCRL and health related quality of life (HRQOL) remain unclear.

Objectives: The aim of this study was to examine the effects of a multidisciplinary oncologic rehabilitation program on BCRL and HRQOL in breast cancer survivors. Results are compared to a control group who continued activities of daily living following breast cancer treatment.

Method/Design: This quasi-experimental study included 174 breast cancer patients in the first year following treatment. Patients in the intervention group completed a 12-week exercise program for 4 hours a week combined with lifestyle guidance for 2 hours a week. The supervised training sessions consisted of aerobic exercise combined with muscular strengthening exercise. Patients in the control group continued activities of daily living following breast cancer treatment. The mean outcomes for BCRL were circumferences of the arms, skinfold thickness at biceps and triceps and bioelectrical impedance analysis performed at baseline (T0) and at the end of the intervention (T1). Measurement of HRQOL was carried out at T0, T1 and at 12-weeks follow-up (T2).

Results and Conclusions: Preliminary results of 40 patients in the intervention group show promising results. The results of the total population (intervention group versus control group) and conclusions of the study will be presented at the congress.

Keywords: breast cancer related lymphedema, physical rehabilitation, arm volume, bioelectrical impedance, health related quality of life.

COMPARISON OF DIFFERENT PHYSIOTHERAPY METHODS ON EDEMA IN PATIENTS WITH CHRONIC VENOUS INSUFFICIENCY

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Introduction: Compression therapy is the primal component of venous diseases. There is limited information about the combination of compression therapy with other physiotherapy methods.

Objectives: The aim of the study was to investigate the effects of compression stockings, complete decongestive therapy and intermittent pneumatic compression on edema in patients with chronic venous insufficiency.

Method: Edema quantities were measured by Leg Q Meter using limb circumference, and pain assessment was done with "Visual Analogue Scale". Quality of life was measured by "Nottingham Health Profile" and "Venous Insufficiency Epidemiological and Economic Study-Quality of Life/Symptoms", depression state assessment was done by using "Beck Depression Scale". Individuals were divided into three groups and the first group (n=14) was included in the complex decongestive physiotherapy program consisting of manual lymphatic drainage, skin care, compression bandage and exercise; the second group (n=14) was included in consisting of intermittent pneumatic compression, skin care, compression stockings and exercise, finally the third group (n=14) was included in a program consisting of compression stockings, skin care and exercise.

Results: It was seen as a result of the in-group assessments that, edema has decreased the most respectively in KBF, IPK, and lastly in the stocking group. Having the pains, quality of life, and ranges of motion of the ankle joints of individuals compared with those prior to treatment, most effective changes were seen respectively in KBF, and IPK groups, while no change was seen among stocking group. It was ascertained from the control measure that, use of stocking improves quality of life, and the pain symptom.

Conclusions: Complex Decongestive Therapy has been found from the results to be the most effective method in decreasing edema, and concurrently in improving the life quality.

Keywords: Chronic venous insufficiency, edema, complete decongestive therapy, intermittent pneumatic compression, compression stocking,

MANUAL DRAINAGE WITH OR WITHOUT MILKING: EFFECT ON LYMPHOEDEMA ARM

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Introduction: Milking movements are often used as an indispensable prerequisite for a manual lymphatic drainage (MLD). But the lack of evidence made them blank.

Objective: Study aim was to compare the reduction of upper-limb lymphoedema resulting from light manual drainage with (MLD) or without (MD) milking movements.

Method: Participants (N=32 ; med: 64 y old) presented an unilateral breast cancer-related lymphoedema for more than 12 months. The medial excess volume was 35%. The first subject was randomized to the group beginning with milking movements. After, we used turns. The MLD protocol started at the neck, next posterior trunck, both axilla before to drain the swollen arm. The modified version (MD) directly started at the affected axilla. At all locations, movements were slowly repeated 7 times. Each session was performed for 22 min. Continuous mercury plethysmography was used to compare any volumetric changes at 5 cm above elbow.

Results: There was no milking effect in response to the movements carried out at distance of oedema. In 2 cases, movements at the affected axilla and/or the two upper third of the arm produced a dermal backflow. In 7 cases, those retrograde movements did not have any milking effect at the lower third of the arm. The 22 min MLD session produced a poor reduction in excess limb volume (-1,14% ∂V). Following the 22 min MD session, there was about a 4 times higher reduction in excess limb volume (-3,99 %∂V). The drainage of the lower third of the arm has not been influenced by the fact that milking movements have been made.

Conclusion: Milking movements at distance did not prove its utility and necessity in persistent upper-limb lymphoedema.

Keywords: breast cancer-related arm lymphoedema, lymphoedema massage, manual drainage (MD), manual lymphatic drainage (MLD, plethysmography.

PRECLINICAL TDC MEASUREMENT MAY BE PREDICTIVE FOR THE ONSET OF ARM LYMPHEDEMA IN BREAST CANCER PATIENTS

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Introduction: Preclinical changes in tissue dielectric constant (TDC), bioimpedance and arm volume measurements after breast cancer surgery, axillary dissection and radiotherapy might be predictive for the onset of chronic lymphedema.

Objectives: To assess incidence of lymphedema at 2-3 years post-treatments among 69 breast cancer patients, not initially diagnosed for lymphedema.

Method: Forty-nine patients had no preclinical changes but 20 patients had inter-arm TDC, bioimpedance and arm volume ratios exceeding the technique-specific lymphedema threshold limits within one year from treatment. Two to three years later, patient records were analyzed for occurrence of lymphedema.

Results: Fourteen of 69 patients had lymphedema. Only 8 of 20 patients with preclinical changes in the first measurement had lymphedema. Five of 8 patients had preclinical changes in inter-arm TDC ratios, 2 of 8 patients in BIS ratios and one patient in arm volume ratio, respectively. The two bioimpedance patients were detected also via TDC. In preclinical TDC measurements, all 5 patients with the onset of chronic lymphedema had highly elevated inter-arm TDC ratios in upper arm skin (mean 1.62). Respective significant preclinical increase in TDC ratio of forearm skin (mean 1.45) was not predictive of lymphedema.

Conclusions: The results are in accordance with Stout et al. (2011) demonstrating that preclinical volume changes in upper arm segments, corresponding to the present TDC measurement sites in upper arm, were predictive of chronic lymphedema. Although a larger material is needed to confirm the present results, they suggest that (1) many patients with preclinical changes do not develop lymphedema, (2) every fourth patient with preclinical changes in inter-arm TDC ratios had the onset of chronic lymphedema, (3) TDC was predicting more patients at risk for lymphedema than bioimpedance and arm volume and (4) follow-up could be focused to patients with increased preclinical TDC ratios in upper arm skin.

Keywords: Breast, Tissue dielectric constant, Lymphedema.

LIVE INDOCYANINE GREEN LYMPHOGRAPHY SHOWS DIFFERENCES IN EFFECTIVENESS OF MLD, LINFOROLL MASSAGE AND INTERMITTENT PNEUMATIC COMPRESSION

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Background: In lymphedema of limbs (LLed) main lymphatic trunks are obstructed and flow of edema tissue fluid (TF) may occur through spontaneously formed tissue “channels” and subepidermal lymphatic plexus previously called “dermal backflow”. Classic lymphoscintigraphy can depict only sites of accumulation of edema TF but not its movement during compression procedures. Indocyanine green lymphograhy (ICGL) is more effective and can show TF movement at the tissue depth of 15mm. Pictures of the flowing TF allow application of effective massage pressure and timing.

Aim: To observe edema TF flow in lymphedematous lower and upper limbs during manual and Linforoll devise massage and intermittent pneumatic compression.

Material and methods: Twelve patients with LLed of lower and twelve of upper limb stage II and III were investigated. ICG was injected between toes or fingers. Massaging started immediately after injection to avoid dye binding with tissue proteins. In groups of 4 classic MLD, Linforoll and IPC compression were applied. Linforoll massage pressure is shown on computer screen, that of IPC is selected on devise prior to massage. In all groups pressures ranged from 80 to 120 mmHg. Visual evaluation of TF flow was done. I some cases local fluorescence intensity was measured.

Results: MLD required forced pressure upon tissues to move radially TF and there was fast backflow upon removal of the massaging hand. Linforoll effectively moved TF unidirectionally without immediate backflow and rolling had to be repeated. IPC moved TF unidirectionally without backflow but 50 sec compression was not enough TF to flow a distance of 9 cm (length of inflated chamber).

Conclusions: IPCL is helpful in evaluation of edema TF flow and should be used in studies of effectiveness of various types of massaging.

Keywords: Linforoll, indocyanine green, lymphography, MLD, IPC.

MEASUREMENT OF TISSUE DIELECTRIC CONSTANT IN PATIENTS AFTER BREAST CANCER SURGERY

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Introduction: Breast cancer related lymphedema is a most drastic situation which effects patients after the breast cancer surgery. Breast cancer related lymphedema incidence is pursued approximately 25-40%. Type of surgery, lymph node excision, chemotherapy, radiotherapy might play important role on developing lymphedema. Undiagnosed and untreated lymphedema gradually get worse. Thus, early detection and treatment of lymphedema is very important. It may be possible to detect lymphedema in early stage on upper extremity with Tissue Dielectric Constant (TDC) measurement.

Objectives: Moisture Meter-D Compact (MMDc) device allows rapid and non-invasiv measurement of Tissue Dielectric Constant. It gives opportunity to measure sub-tissue fluid wherever needed in 2.5 mm depth. The aim of this study was to evaluate patients who had breast surgery but having no lymphedema and reveal ratio analyze with TDC.Method-

Design: Patients were positioned on an examination table which consists of elbow and hand supportive part. 8 cm proximal and 6 cm distal from cubital area and 10 cm inferior from axilla were marked with soft pencil before measurements. Measurements were done triplicate bilaterally for two arms.

Results: 22 patients (mean age: 52±13,41 years) were included into this study. Mean BMI 30,6±6,46 kg/m^2, mean time spent after the surgery 35,40±45,29 months were found. Local mean ratio values of patients for 8 cm proximal of cubital area was 1.0718±0,205, 6 cm distal of cubital area was 1,0061±0,184 and inferior axillary area was found 1,1822±0,266.

Conclusion: Tissue Dielectric Constant measurement has been gradually gaining attention in clinical use for early detection of lymphedema. Studies revealed that having "1.20" or upper ratio value is determinant of clinically lymphedema after breast cancer surgery. It is important to use TDC measurement for early and follow up detections in lymphedema.

Keywords: Tissue Dielectric Constant, Breast Cancer, Lymphedema.

COMPARISON OF RELIABILITY AND TIME-EFFICIENCY OF VOLUME MEASUREMENTS OF THE FOOT

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Introduction: In clinical practice, different methods are applied to estimate the volume of the foot. To our knowledge, its reliability and time-efficiency has never been compared.

Objective: The purpose of our study was to compare reliability and time-efficiency of following assessments of the volume of the foot: circumference measurement with the figure of 8 method, circumference measurement at the level of the malleoli and forefoot and the water displacement method.

Methods: 30 patients with primary (N=4) or secondary lymphoedema (N=26) of the lower extremity are included. The 21 women and 9 men have a mean age of 63 (±11) years. All patients were evaluated in the Lymphovenous Center of the University Hospitals of Leuven. All measurements were performed twice by two different assessors. Time was recorded after each measurement.

Results: Interrater reliability of circumference measurement at level of malleoli and forefoot (ICC 0,80 and 0,79) is lower than that of the figure of 8 method (ICC 0,94) and of the water displacement method (ICC 0,99).
%SEM is 3,0% and 2,8% for the circumference measurements at malleoli and forefoot, 1,3% for figure of 8 method and 2,5% for water displacement method.
Water displacement method takes significantly more time (3 minutes on average) than figure of 8 (1 min) ($p<0,01$) and than malleoli/forefoot (1 min) ($p<0,01$).

Conclusion: In clinical practice, since better time-efficiency and better reliability, the figure of 8 circumference measurement is the preferred method to estimate the volume of the foot (compared to the water displacement method and circumference measurements at the level of malleoli and forefoot).

Keywords: lymphedema, volume foot, water displacement method, circumference measurement.

BACTERIA ARE PRESENT IN SUBCUTANEOUS TISSUE IN OBSTRUCTIVE LYMPHEDEMA – LONG-TERM PENICILLIN PREVENT THEIR PROLIFERATION AND SUBSEQUENT HOST INFLAMMATORY RESPONSE

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Objectives: Dermato-lymphangio-adenitis (DLA) occurs in about 50% of cases with obstructive lymphedema of lower and upper limbs. Each recurrence is followed by progression of edema and irreversible increase in limb size. Question arises whether bacteria are permanently present in lymphedematous tissues.

Aim: To identify bacteria in lymphedematous tissues, their location, migratory properties and responsiveness to antibiotics.

Methods: Study was carried out on 50 patients with obstructive lymphedema of lower limbs. Skin and subcutaneous tissue fragments were harvested under strict aseptic conditions in operating room. Scalpel, forceps and gauze were cultured. Bacterial fall-down was routinely measured. Specimens were placed on Hemoline plates and put into warm box for 3-5 weeks. Bacterial strains from colonies were identified. In 18 cases skin and subcutis fragments were evaluated in scanning electronmicroscopy. Patients were given long-term penicillin for 6 months.

Results: On-plate culture revealed delayed migration and confluent colony formation around and on tissue fragments in over 40% specimens. Strains were Staph.epidermidis and other coagulase-negatives. Staph.aureus meticillin-sensitive was other most common. All were sensitive to standard antibiotics. In some cases slight resistance to penicillin was noted. On electromicrographs single extracellular cocci and bacilli were identified. No colonies as seen on-plates were seen. There were few macrophages close to bacteria.

Conclusions: Single bacteria are found in subcutis. Lack of immune cells in their vicinity. These are most likely "dormant" bacteria. We speculate that permanent presence of penicillin keeps them in non-proliferating state.

Keywords: Bacteria, cellulitis, lymphedema, penicillin, inflammation.

THE INTERNATIONAL COMPRESSION QUESTIONNAIRE: RELIABILITY AND VALIDITY

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Objectives: Studies about the effect of compression uses general questionnaires as SF-36 or disease specific questionnaires. A questionnaire assessing all aspects of compression therapy is missing.

Objectives: The purpose of our study was to develop a questionnaire assessing all aspects of compression (aim 1) and to investigate it on reliability and validity (aim 2).

Methods 1: The development was based on information from literature, experts in the field and patients wearing compression therapy.

Results 1: The International Compression Questionnaire has to be filled out by patients wearing compression and by their health care provider. The questionnaire for patients consists of following domains: wearing time, ease of application/ removing, comfort, complications, physical functioning and symptoms. The questionnaire for health care providers collects information about previous compression, covering the limb and the skin under the compression.

Methods 2: To assess reliability and validity, 30 patients wearing compression were recruited between February and April 2015. Test-retest reliability, face and content validity were investigated.

Results 2: 16 patients suffered from lymphedema and 14 had chronic venous disease. Concerning the questionnaire for patients: 35 of 39 items (90%) had moderate to strong reliability, 80-97% of the patients found the questionnaire understandable and 87-97% of them found the questionnaire complete, which indicates good face and content validity. Concerning the questionnaire for health care providers, 5 of 8 items (62%) had moderate to strong reliability.

Conclusion: The International Compression Questionnaire for patients has good reliability, face and content validity. The questionnaire for health care providers has moderate reliability. Further research is needed to investigate construct validity of both questionnaires and face en content validity of the questionnaire for health care providers.

Keywords: compression, questionnaire, patients, health care providers.

MID- AND LONG-TERM RESULTS IN POSTOPERATIVE PATENCY OF LYMPHATIC VENOUS SIDE-TO-END ANASTOMOSIS

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Introduction: There are some reports in lymphatic venous anastomosis for treatment of peripheral lymphedema. Most of them mainly evaluated volume changes after surgery. We reported postoperative patency of lymphatic venous side-to-end anastomosis (LVSEA) by ICG fluorescence lymphography. In this paper we report mid- and long-term results in postoperative patency for treatment of peripheral lymphedema.

Objectives: Aim of this report is to reveal how long LVSEA works after surgery. (Methods) Between 2007 and 2012 out of 70 patients who underwent LVSEAs by one surgeon and postoperative ICG lymphography 11 patients (3 upper and 8 lower limb) with one and more paten anastomoses were evaluated again about 4 years and more after the first surgery by 2nd postoperative ICG lymphography because of additional LVSEA to obtain more improvement or changes of clinical conditions.

Results: Out of 11 patients 6 had patent anastomoses and their clinical conditions were stable in volume and subjective. In other 5 patients 3 had episodes of cellulitis after 1st operation.

Conclusions: Patency rates in lymphatic venous anastomosis gradually decreased in reports on animal experiments, however, causes of occlusion are unknown. In our clinical experiences inflammation in the affected limb seems to be one of causes for occlusion, so prevention of cellulitis in patients with lymphatic venous anastomosis is though to be important to maintain patency.

Keyword: lymphatic venous anastomosis, patency, fluorescence lymphography.

INTEREST OF THE LYMPHOSCINTIGRAPHIC INVESTIGATION OF THE DEEP LYMPHATIC SYSTEM IN PATIENTS WITH LOWER LIMB EDEMA

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Introduction: Lymphoscintigraphy is the gold standard examination to evaluate the lymphatic function in patient with LLE but the injection of the tracer in the first interdigital space of the feet allows only the investigation of the superficial lymphatic system (SLS). In some cases with limited swelling and/or symptoms, the examination of the SLS may also be sometimes "paradoxical" (lymphatic function of the edematous limb is better than on the "normal" limb). The aim of this study is to report our observations and the interest a lymphoscintigraphic examination of the deep lymphatic system (DLS) in patients with LLE.

Material and Methods: The lymphoscintigraphic examinations of the DLS and SLS of 37 patients (without any previous venous events) with unilateralized LLE in 15 (group 1) and with bilateral but asymmetrical LLE in 22 (group 2) were reviewed. A rating system was used to compare the SLS and DLS of the edematous limb and of the non or less-edematous limb.

Results: In the whole series, no statistical difference was observed between the SLS of the edematous and non-edematous limbs while the comparison between the DLS of the two limbs showed a statistical difference. A "paradoxical" SLS result was observed in 2/3 of the group 1 and the half in group 2. The investigation of the DLS showed also a decreased function (in agreement with the clinical lateralization of the edema) in 2/3 of the group 1 but in 17/22 in group 2. In group 1 and 2, the paradoxical better function observed at the level of the SLS was respectively associated in 6/10 and 7/11 to a decreased function of the underlying DLS.

Conclusions: In this series of patients, the lymphoscintigraphic investigation of the DLS appeared useful and explanatory of the LLE lateralization as well as the paradoxical results of the SLS in at least one third of the cases.

SESSION X
POSTERS

MAGNETIC RESONANCE IMAGING FOR LYMPHATIC VESSELS EXPLORATION: A CASE REPORT

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Introduction: Among lymphatic diseases, thoracic duct malformations or flowing abnormalities are rarely related in literature. Imaging, especially MRI, may contribute to their diagnosis.

Case Report: A 20-year-old woman has been suffering from recurrent swelling episodes of the left supra-clavicular and axillary areas for two years. These edemas are painful, without any evident triggering event and persist a few days, several times each year. During the crisis, the clinical exam has confirmed a left supra-clavicular fossa filling, chest wall swelling and an increased left arm circumference. Blood tests are normal, as are ultrasound and computed tomography. A MRI has shown a voluminous mass made with inflated lymphatic ducts in the left cervico-thoracic area. Its venous ending seems to be located in the mediastinum, independently from the thoracic duct. The only curative treatment would be a surgical removal of this lymphatic malformation with a high risk of complication such as chylous pleural effusion. Lymphatic drainage failed to improve the symptoms.

Discussion: MRI allows a non invasive exploration of slow flow fluids such as lymphatic vessels. Cases of recurrent swelling of the left supra-clavicular fossa with a lymphatic origin are related in literature. Some of them are linked to a lymphocele of the thoracic duct end. Others seem to be in relation with a lymphatic mass probably constituted with lymphangiectasia, similar to our case. However we did not find any case with such a voluminous malformation. Cases of thoracic duct ostium thrombosis are described, relevant to jugulo-subclavious junction thrombosis. Finally, cases of left sub-clavicular swelling after fat diet have been related.

Conclusion: A lymphatic etiology must be searched in case of fluctuant swelling of the left supraclavicular fossa. MRI gives an anatomical analysis of lymphatic vessels and their variants or malformation. It should be used in first intention in the diagnosis process.

Keywords: lymphatic, thoracic duct, swelling, MRI.

EFFECTIVITY OF UNSTABLE SHOE IN LOWER LIMB LYMPHEDEMA. A FOLLOW UP OF ONE YEAR

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Introduction: Muscle and joint pumps are important lymphatic fluid return enhancing mechanisms. They are influenced by active muscle work and both active and passive kinesiotherapy. Unstable shoes by activating the muscles in the lower limbs take part in the activation of these mechanisms.

Objectives: To evaluate the effectiveness of unstable shoes in patients with lower limb lymphedema on volumen and quality of life.

Method: Double blind, randomized trial. In addition to standard lymphedema treatment, experimental group wore unstable shoes (MBT®) for eight weeks during their daily activities; the control group used regular trainers. Limb volume was measured using the Kuhnke formula. Quality of life was assessed using the EQ-5D questionnaire. Raynaud's scale was employed for collecting signs and symptoms. For the comparative analysis, Wilcoxon's test and Mcnemar's test were used.

Results: 18 subjects participated in the study: 11 in the experimental group and seven in the control group. In the experimental group, 14 volume changes were detected: in eight cases (57,14%) volume had decreased and in 6 (42,86%) had increased. In the control group the measurements showed 10 volume changes: seven (70%) decreases and three (30%) increases. After the intervention, both groups showed an improvement in the quality of life: in the experimental group the score increased 16 points versus 11 points in the control group. After one year, 8 (73%) participants of the experimental group and four (57%) participants of the control group were still wearing the shoes assigned for the study.

Conclusions: Wearing unstable shoes has not shown a significant influence in reducing volume. While reduction of most symptoms studied was not significant, it leads to think that this shoe is recommendable for walking and for long periods standing, since it decreases leg cramping. This kind of footwear may contribute to improving quality of life in this population.

Keywords: Lower limb lymphedema, Kuhnke, quality of life, unstable shoes, muscle pump.

TACTICS IN THE TREATMENT OF LOWER LIMB SECONDARY LYMPHEDEMA

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Objectives: To evaluate the effectiveness of tactics of diagnosis and treatment in patients with the lower-limb secondary lymphedema.

Methods: During 5 years 58 patients with the lower-limb secondary lymphedema (IV stage) were being monitored. Ultrasound scanning, volumetry, computed tomography and clinical analysis of movements were applied during the examination combined with clinical and laboratory studies. The staged operative interventions were carried out in patient on the complex conservative treatment background. Life quality was estimated by means of the questionnaire "SF-36 Health Status Survey".

Results: The presented observation of the patient shows that on the first stage of treatment, the use of lymphotropic and prolonged intramuscular antibiotic therapy, the series of plasmapheresis and ultraviolet blood irradiation resulted in a stable remission in the recurrent erysipelas. Surgical intervention by creating lymphoveinous anastomosis to correct a lymphatic drainage proved to be ineffective. Volumetry and computed tomography performed at the next examination of the patient, permitted to specify a heavy, IV stage of the disease. In this regard, the patient underwent surgery of the modified tibia dermalipofascioectomy. Five months later a reduction of functional failure of the affected limb and the increase of life quality have been approve. The reduction of the feeling of heaviness in the leg and quickly relieve symptoms have been registered. Volumetric measures of lower limbs made up 20477 cm^3. Computed tomography showed a decrease in the soft tissue thickness of the left shin up to 26 mm, and the preservation of their density at the level of -26 HU.

Conclusions: Computer tomography plays a significant role in determining the disease stage and choice of a diagnostic optimal treatment tactics. At all stages of the disease a systematic complex treatment is indicated. A surgical correction such as the lymphoveinous shunting is considered to be possible in patients with the initial stages. Resection is recommended in the case of the 3rd, especially 4th stage of lymphedema.

Keywords: lymphedema of the lower limbs, computer tomography, surgical treatment.

LYMPHEDEMA IN SENTINEL NODE NEGATIVE BREAST CANCER PATIENTS: A LONG TERM VIEW

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Introduction: The sentinel lymph node biopsy (SLNB) is widely used as a standard procedure in breast cancer patients. In the literature, SLNB and an axillary lymph node dissection (ALND) are often compared with beneficial results in favor of SLNB regarding lymphedema. Despite a strong reduction in morbidity after the SLNB procedure, the negative aspects may be underestimated.

Objective: Firstly, to investigate the incidence of lymphedema on the long term and its treatment in sentinel negative patients. Secondly, to assess the impact of lymphedema on activities of daily living.

Methods: 126 breast cancer patients who underwent a SLNB in the Interdisciplinary Breast Clinic of the University Hospital in Antwerp more than 2 years ago were included in this cross-sectional study. Lymphedema was assessed by a newly developed questionnaire.

Resuts: 7.1% (n=9) of sentinel node negative patients reported that they had developed lymphedema since their surgery. In a period of 2 to 7 years post-surgery 5.6% of patients reported that lymphedema was still existent. Patients with lymphedema had significant limitations in activities of daily living; work (p=0.027), household (p=0.027), driving (p=0.037) and sports (p=0.019). Current standard management of secondary lymphedema is the complex decongestive therapy (CDT). This includes the application of bandaging, manual lymph drainage (MLD), exercise, skin care and compression therapy. Of all patients with arm lymphedema, MLD was performed in 77.8%, exercise in 44.4%, the application of bandaging in 22.2% and none of the patients received information on skin care.

Conclusion: Arm lymphedema in sentinel node negative patients is not negligible and has a significant impact on activities of daily living. Few patients received the correct treatment for lymphedema which is essential for the management of this chronic condition. Therefore it is important to encourage therapists to use CDT.

Keywords: Breast neoplasms, Sentinel lymph node biopsy, lymphedema, epidemiology.

IS A LYMPHO-LINGUIST AROUND THE CORNER?

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There's no dictionary that defines certain technical terms. This gap opens the door to some abuse interpretation. Thus some guidelines have as much value as a hunting regulation written by a poacher.

Stretch/compression: Stretch designates the elastic extend potential that oppose to oedema recurrence; the «compression» is in relation with shrink potential force and then the potential to lengthen the decongestive effect after the session.

Multilayer/composite: «Multilayer» is a usual but improper expression: as the spirals are semi-superposed, any bandage is automatically multilayer. With the superposition of different properties materials, the bandage would be said composite.

Appel/milking effect: Appel means to push far away and is to clear the blocking. "Milking effect" may suck up some oedema just nearness of its top.

Decongestive physiotherapy qualification: Some may seen innocuous at first but well evoke an unwelcome stereotype conferred by an incomplete concept of the decongestive physiotherapy

Drainage: For many, "drainage" only connotes capture and flow within a collector. This is to ignore the other drainage ways: "spaghetti" drain, plots deep infiltration, to thrust one's way through saturated dermis to a free-saturated or desaturated one's, etc.

Don't fall « in » or « into » the lake: Which preposition you choose depends somewhat on the meaning you want to convey. You normally use «in» to speak about an open expanse of oedema and «into» is the choice when oedema snare into a closed space.

IMP is short for ideal manual pressure. this notion is a simple formula that not have a fixed shape. So, any restricted value is to overstep the boundaries of oedema's decongestion: an oedema is not a pression but an excess of volume on which we have to exert pressure to drain.

Keywords: decongestive physiotherapy, ideal manual pressure, lymphatic lac, milking effect, multilayer bandage.

PROPRIOCEPTION MODIFICATIONS IN PATIENTS SUFFERING FROM UPPER LIMB SECONDARY LYMPHOEDEMA

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Background: Proprioception was in 1906 firstly defined by Sherrington a signal flow from muscles, tendons, joints. Kinesthesia, is used to refer to sensations of limb position and movement. The difference between what is expected and the actual position and movement of the limb occurs through a feedback. The study of proprioception in lymphedema, where we are aware that it is impaired, has been very little investigated. The pilot study has thus the aim of providing prove of the affected proprioception in lymphedema affected limbs, testing both the movement sensation and the joint position sense, giving advice to perform a work based on large number of patients in order to provide a significative proof of impaired proprioception in lymphedema.

Materials and methods: Blindfolded subjects sat at a table with their forearms positioned on paddles. The hinges of the paddles were aligned with the elbow joint and had electronic goniometer to measure the angle in positioning the forearm. One of the paddles could be moved by an electric servomotor with a slow angular speed of 1,3 degrees per second, that could be hardly appreciated by the muscle spindles, the proprioceptors mainly responsible of kinaesthesia. Subjects have to guess the position of the affected arm, as the paddle moves, in comparison with the fixed other one, placed on a standard position of 45 degrees, studying the position sense of the lymphedema affected arm. The same subjects have also to guess when the paddle of the affected arm is moving, providing a test for the movement sense. 30 women affected by secondary upper arm lymphedema were enrolled in the study, with a mean age of 65. All of the subjects didn't have neurological (either central, or peripheral) problems. All lymphedema affected subjects underwent a measurement of the circumference of the forearm at the middle point. Informations were collected on how many years the lymphedema lasted. The control group consisted of 30 healthy women that underwent the same test, with a mean age of 54.

Results: According to the range of motion at the moment in which the subject appreciates the sensation of movement, all of the subjects could appreciate the movement at the very beginning. On the other hand most of the patients could not match the position on the contralateral upper limb, obtaining a variable difference (delta) in the sense of a too early valuation of the position of the affected arm, as corresponding to the unaffected arm. This aspect was common to the control group, since the results are matched with a control group of unaffected women. What was interesting was to match the mean delta of the control group with the lymphedema group. There was a significant difference between the control group and the lymphedema group with a mean delta of 12,0 degrees for the control group and 15.3 for lymphoedema group. Thereafter we tried to match the altered proprioception of the lymhoedema subjects with the stage of lymphedema, taking into account the circumference at the middle point of the forearm. Putting into a graphic the values of deltas and the circumference of the forearm, the trendline didn't show any singnificant correlation. Matching the deltas with the lifetime of lymphedema expressed in years, on the other hand the trendline suggests a significant correlation. Preliminary results are showing significant impairment in joint position sense in the accuracy of joint–angle replication measured in joint position matching tests, measuring subject's ability to detect an externally imposed passive movement. Less impaired seems to be the movement sensation with the method used. Most significant correlation appeared in impaired proprioception for upper limb lymphedema in the sense of duration of lymphedema. Trendline showed that the more a lymphedema lasts, the wider were errors in matching upper limb position.

Conclusions: Adding more data and reaching a sufficient number of cases studied, this study aims to demonstrate impairment of proprioception in lymphedema patients, which is something always perceived by clinicians, but rarely demonstrated, mostly in the duration of lymphedema, rather than the stage.

MEASUREMENT OF LYMPHEDEMA: PYTHAGORAS VS ARCHIMEDES VS HIGH-TECH

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Introduction: Measurement of lymphedema still remains a challenge. It must combine quality of measurement, rapidity, ease of use and minimum intra- and interoperator variation. The device and the method have to be accurate and sensitive enough to detect tiny variations, in order to detect as early as possible the occurence of the edema, and to follow the edema in the time. In the present study, we compared 3 methods of edema measurements: tape perometry, the Archimedes method and the 3D-imaging.

Material and Methods: The study has been performed on the upper limb. The limb has been graduated every 4cm from the pisiform along 32cm, defining 5 areas. The tape perometry consists in measurement of perimeters on each graduation and the figure 8 method for the hand. The Archimedes method consists in immerging the limb of the patient by step of 8cm. The immerged part of the volume can be measured as the reaction of the Archimedes force which is applied on a weight. The 3D-imaging consists in acquiring a 3D model of the arm and in evaluating the volume by software.
The two upper limbs of 8 patients were measured by two operators, giving a sample size of 16. Each operator performed twice the measurements except for the 3D-imaging.

Results: We evaluated and compared the quality of the measurements of the three techniques according to mathematical and practical aspect as well.
The results have highlighted the difference between the intra-operator errors, inter-operator errors and the bias induced by the techniques.
The different techniques present specific advantages/weaknesses:
The perometry method is very easy, low cost and presents a good trueness and a very low intra-operator error on the areas taken separately (parts of 8cm). However, the bias is important.
The Archimedes method is also easy and can be automated with a dedicated software including data in the patient files. It shows a very low inter-operator error on the cumulative areas (part 0-32cm).
The 3D-imaging is very expensive and time consuming but produces a good trueness of the measurement.

Conclusion: This study has confirmed the problematic of the quality of measuring volumes in lymphedema through different aspects such as reliability, efficiency, use in routine and costs. It shows that our simple method revisiting Archimedes principle is well suited to improve the measurement quality. It may therefore be a fast alternative to the water displacement method.

LIPOFILLING OF THE AXILLO TO REDUCE SECONDARY LYMPHEDEMA AFTER AXILLARY LYMPH NODE DISSECTION

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Introduction: Axillary lymph node dissection (ALND) represents a necessary, but not sufficient condition to develop breast cancer related lymphedema (BCRL). Up to now, venous impairment has not been considered enough. During surgery, adipose tissue surrounding the axillary vein is removed. The axillary sheath can also be damaged. Such an anatomical disruption may significantly reduce the local hemodynamic conditions. Following specific criteria, we identified BCRL patients who present this impairment and proposed them to undergo a simple and original surgical approach which reduces edema conditions.

Methods: BCRL patients with positive clinical signs for axillary hemodynamic changes underwent a lipofilling under the axillary vein. Right after surgery, and for a 10 days period, the patients did not get any treatment nor did they use sleeves. Precise volumetry was performed the day before surgery, the day after and 10 days later (CE AK/13-06-75/4276AD, EudraCT n° 2015-001565-37). After 10 days, the patients resumed their previous physical treatment while we continued to evaluate the volume of their limb with volumetry. Subjective symptoms such as numbness, heavy arm, pain and tension of the skin were evaluated.

Results: 62 BCRL patients underwent lipofilling surgery. For the majority of the patients, the edema volume reduced significantly. This reduction had already been observed right after surgery, and it maintained throughout the 10 days preceding the resumption of the physical treatment. Subjective symptoms of lymphedema started to decrease directly after the operation. Most of the patients went on with their physical treatment, but they felt that compression garments were not essential anymore to maintain the edema at a low level. After 18 months of follow up, no complications were recorded.

Conclusions: In selected BCRL patients, lipofilling under the axillary vein improves local hemodynamic, reduces distal hyperfiltration and consecutively reduces part of the edema. The results of this pilot study need to be empowered by multicentric studies.

DOES THE REVISED STARLING'S EQUATION MODIFY THE THERAPEUTIC MANAGEMENT OF PATIENTS SUFFERING FROM LYMPHEDEMA (LE)?

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Introduction: According to Starling, many years ago, it was explained that intra capillary pressure was higher than the interstitial pressure and so, fluid had to pass through the capillary membrane which was permeable to water and crystalloids.
As no swelling due to edema occurred, it was suggested that the fluid was submitted to a reabsorption. Osmotic pressure of plasma proteins (ie oncotic pressure) might exert this role.
At the arterial extremities of the capillaries the hydrostatic pressure was established at a much higher level than that of oncotic pressure, whereas at the venous extremities the reverse must be true.
Johnson said that this is not actually what must really happening. He pointed out that the hydrostatic blood pressure greatly exceeds the oncotic pressure of plasma proteins, everywhere in the capillaries, preventing reabsorption.
The filtered fluid returns to circulation on as lymph. Nearly all the capillary filtrate will return to the blood circulation by the thoracic duct and the right thoracic lymphatic duct (Huxley-Scalan).

Physiopathology: The physio pathological mechanisms of LE are not basically disturbed by this new analysis of Starling's equation. They are just modified by taking into account the essential role of the Lymphatic System (LS) in fluid exchanges (various schemas can explain these changes).

Consequences for the treatment: The medical techniques which have always demonstrated their efficacy to reduce LE must be maintained.
In LE due for the absence or destruction of lymph vessels it is of great importance to actively mobilize the edema towards a body part which has a functional LS. Massages and the use of an intermittent compressive pump which work from upstream to downstream on the lymphatic flux are to be recommended. In the same way contention garments are also recommended. They act to prevent swelling and reducing the capillary filtration.
In other cases, such as lymphatic functional insufficiency due to various repeated aggressions against the lymph vessels, over a long period of time, the same therapeutic techniques can be used. Possibly active drugs, known to be able to augment lymphatic permeability and/or to increase lymphatic contractions may be added. These diverse propositions coming from several authors have to be discussed.
Since LS is of great importance, all must be done to protect it.

LOOKING FOR A SAFE WAY FOR THE WITHDRAWAL OF COMPRESSION GARMENTS IN PATIENTS WITH BREAST CANCER RELATED LYMPHEDEMA

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Introduction: We observed in our clinical practice that some breast cancer related lymphedema does not progress, but stabilizes or even improves. Moreover, some patients who decided stopping the use of compression garments on their own initiative did not worsen.

Objectives: To compare the evolution of patients who stopped using garments with those who continued using garments.

Method/Design: Patients with breast cancer related lymphedema who had stabilized volume (changes <5%), without inflammatory complications at least for the last 12 months, and without symptoms of worsening while not using garments, were offered to stop using garments in a progressive and monitored way. They were followed-up 2 years and compared with patients who continued using garments. Outcomes were change in excess of volume and inflammatory complications. Analysis were performed by the t Student and X2 test ($p<0.05$).

Results: 76 patients were included, 16 of them in the stopping group. Lymphedema severity was mild (<20% excess of volume) for 41 patients and was moderate (20-40% excess of volume) for 35 patients. Three patients should return to garment use because of volume increase. There were 2 (12.5%) patients in the stopping group who had inflammatory episodes while there were 9 (15%) patients in the control group ($p=0.581$). The mean change in excess volume after 2 years was 0.8% (SD 5.8) for the stopping group, and -0.5% (SD 12.9) for the control group. These differences were not significant ($p=0.563$). There were no significant differences in the analysis stratifying by lymphedema severity.

Conclusions: At a follow-up of 2 years, there were no significant differences in the change of excess of volume between groups. More research is warranted to determine which selected, stabilized lymphedema patients could benefit from this reduction in the burden of self-care.

Keywords: Breast cancer; Compression garment; Lymphedema.

EARLY ONSET PRIMARY LYMPHEDEMA OF LOWER LIMBS. DELAYED DIAGNOSIS AND COMPLICATIONS

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Introduction: Idiopathic lymphedema of lower limbs is a disabling condition in which infectious complications may occur without a proper diagnosis and management. It is a congenital, simple or hereditary condition, due to failures at the vessels or lymph nodes.

Objective: To describe a case of Meige's Syndrome with a late diagnosis, showing IV stage lymphedema and troublesome infections.

Design: Clinical case: 54 year old patient with personal history of obesity, hypertension, NIDDM. Controls in Vascular Surgery because of ulcers in limbs related to venous insufficiency.
Suffers from early onset edema (in his youth); present in mother too. Ulcers cured in Primary Care Center, and cellulite on 2 occasions last year.
Physical examination: bilateral severe edema with fibrosis and skin changes (elephantiasis, stage IV). Stemmer +. Exudative ulcers at the back of left calf. No cellulite. Circumferential measurements of both limbs are performed.
Seen by Internal Medicine that rules out underlying pathology. A lymphoscintigraphy compatible with primary lymphedema is performed.
We indicate lymphatic drainage massage to soften edema in right limb, and a circular-knit compression stocking with silver nitrate patches for left side, plus using PH5 emollient cream and sterile gauzes for cleaning and drying. Strict control of any symptoms of cellulitis. Weight loss.

Results: A minimum softening of fibrosis and improvement of skin condition with improvement of ulcers on the left side is seen. There were no significant changes in measurements and no symptoms of cellulite. Cures and circular-knit stocking are continued for the left side, awaiting for a complete cure of ulcers to consider drainage or introducing flat-knit stockings. Compression class 4 flat-knit stocking on the right side is introduced. Improvement of wounds, painful and heaviness was seen.

Conclusions: Early diagnosis and management of primary lymphedema in lower limbs is essential to avoid potential complications and secondary infections and disability.

Keywords: Primary lymphedema; Meige's disease; delayed diagnosis; complications.

EVALUATION OF THE EFFICACY AND SAFETY OF A TWO-LAYER COMPRESSION BANDAGE SYSTEM IN THE TREATMENT OF LOWER LIMBS LYMPHEDEMA

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Introduction: Primary lymphedema is a chronic illness due to a lymphatic system dysfunction, characterized by an abnormal collection of lymph in the subcutaneous tissues affecting mainly the lower limbs.
There is no curative treatment for the lower extremity lymphedema disease; however a combination of cutaneous care, lymphatic drainage, exercises and movements in association with a two-layer compression bandage system allows an appropriate management of this pathology.
The overall prevalence of lymphedema is 0.13-2% with a high psycho-social impact associated to an impaired quality of life.

Objectives: UrgoK2, a two-layer compression bandage system, was launched by URGO laboratories in 2007 dedicated to venous leg ulcer etiological treatment. Recently, UrgoK2 indications have been extended to lymphedema management.

Methods: A clinical evaluation was conducted in a French hospital unit, recognized for its expertise in lymphedema, to evaluate efficacy of this two-layer compression bandage in this pathology ; the volume reduction of the lower limb after treatment, was chosen as the primary criteria.

Results: 8 patients with lower limbs primary lymphedema advanced Stage II, mean age 64 years, mean BMI over 41kg/m^2 were included in this clinical evaluation.
After 33 days of mean treatment duration, a 8% volume reduction (mean value) was documented, combined with a good local tolerance.
The acceptability of the tested compression system was considered by the patient as "good" and "very good" for day/night comfort.
The authors will present clinical data's details for the 8 patients included and treated in this evaluation.

Conclusion: UrgoK2 compression bandage system is judged as effective and well-tolerated in this chronic pathology and may play an important role in the treatment of lower limbs lymphedema.

Keywords: lymphedema, two-layer compression bandage system, clinical evaluation.

INDOCYANINE GREEN LYMPHOGRAPHY IS HELPFUL IN DETECTION OF EARLY LYMPHEDEMA AFTER BREAST AND UTERINE SURGERY BEFORE IT IS CLINICALLY DIAGNOSED

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Bacground: Patients treated for cancer by removal of breast or uterine tumor and lymphadenectomy live longer and display complication of therapy as limb lymph stasis with infections, increase in volume and weight and disabled function. Around 40% of postmastectomy and 25% posthisterectomy lymphedema are registered and numbers are increasing with longevity of patients. The development of lymphedema could be controlled if the early diagnosis were made before overt edema is seen.

Aim: To early diagnose lymph stasis in postmastectomy and posthisterectomy patients using indocyanine green lymphography (ICGL) before it is detected by the patient.

Materials and Methods: Twenty patients first year after axillary lymphadenectomy and twenty after histerectomy without visible edema of the limbs underwent ICG lymphography and pattern of lymphatics and sites of tissue fluid stagnation were evaluated. Time of ICG transport to the proximal part of limbs was estimated. Both limb parameters were compared.

Results: *Postmastectomy*. ICG accumulated in all patients at axillary pit, did not move across it but spread laterally displaying a dense meshwork picture. Time ICG reached arm pit was 2-3-times longer than on the healthy side. *Posthisterectomy*. ICG reached groin region to produce a picture of a mesh sometimes very limited but evident. In few cases it was seen in the hypogastrium. In other few it was seen on both sides, however, one side dominated with larger area of stagnation.

Conclusions: ICG lymphography is a useful diagnostic tool for early detection of lymph stasis leading to formation of lymphedema. Applied early after lymphadenectomy it may allow administration of prophylactic measures preventing development of large edema and cellulitis.

Keywords: Linforoll, indocyanine green, lymphography, MLD, IPC.

LYMPHEDEMA IS SUCCESSFULLY TREATED BY SILICONE TUBE IMPLANTATION BYPASSING THE AXILLARY PIT

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Objectives: Women treated for breast cancer are facing a life-time risk of developing lymphedema in up to 40% of this population. In advanced cases of lymphedema main lymphatics are obstructed and tissue fluid accumulates in the interstitial spaces forming fluid "lakes"and "channels". The only solution for fluid drainage would be creating artificial channel for the flow away to the non-obstructed regions.

Aim: To form artificial pathways for edema fluid flow by subcutaneous implantation of silicone tubes bypassing armpit.

Material and Methods: Implantation was carried out in 20 patients with lymphedema after mastectomy, axillary lymphadenectomy and radiotherapy, stage II and III. Conservative treatment for at least 12 months remained without success. Tubes were placed from hand dorsum, through forearm and arm to scapular region. Implantation was followed by routine arm sleeve compression. Prophylactic long term penicillin was administered. The follow up is at present 12 months. External compression remained same as before implantation.

Results: a) implanted tubes brought about fast evacuation of excess tissue fluid, b) most decrease in circumference, volume and stiffness occurred in first two weeks, c) lymphoscintigraphy tracer accumulated in tubes and around them, d) free fluid was seen on ultrasonography at both ends of tubes and in between, e) no postoperative infection complications or tubing expulsion.

Conclusions: We propose a multimodality method comprising implantation, limb compression to generate fluid pressure gradient for flow and prevention of inflammation by administration of long-term penicillin. Operation is low-invasive and lasts 30minutes. It can be done in large cohorts of patients.

Keywords: Lymphatics, surgery, silicone, obstructive, tubings.

EVALUATION OF KINESIOPHOBIA IN PATIENTS WITH LYMPHEDEMA: PRELIMINARY RESULTS

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Introduction: Lymphedema is a chronic progressive condition which affects patients in multiple way. Patients often experience heaviness and fullness feelings due to lymphedema. Heaviness and fullness feelings tend to become chronic and it may causes pain. Thus, patients with lymphedema tend to not moving or exercising. This movement fear causes kinesiophobia. Exercise is one of the main point in lymphedema treatment. As with increasing kinesiophobia, patients avoid doing exercise. Thus, this situation might causes worsening of edema, decreasing quality of life of patients and deprivation of sistemic beneficial effects of exercise.

Objectives: Tampa Scale of Kinesiphobia (TSK) is a valid and reliable questionnaire. It consists of 17 questions. Questions are answered as strongly disagree,disagree,agree and strongly agree and kinesiophobia points is calculated by according to Likert scoring scale. Patients can take points between 17 and 68. As with increasing points, so kinesiophobia level does.

Method-Design: 18 patients (9 patients who have either upper or lower extremity lymphedema, 9 healthy participants) were enrolled in this study. TSK were applied to them.

Results: Mean age for healthy participants was 37,44±10,27 years, mean body mass index (BMI) 24,01±2,72 kg/m^2 was found. Mean TSK score was 34,11±6,52 (min 25, max 44). Mean age for lymphedema patients was 48,55±16,23 years, mean BMI 36,56±14,41 kg/m^2 was found. Mean TSK score was 42,33±8,17 (p: 0.31, p>0.05).

Conclusion: Kinesiophobia might be develop in lymphedema patients and it can causes sedantary life style in these patients. Thus lymphedema might be getting worse. Tampa Scale of Kinesiophobia might be sufficient for detecting kinesiophobia in these population. These are preliminary results of this study. We think that with further studies and larger sample size would raise kinesiophobia scores in patients with lymphedema.

Keywords: Lymphedema, Kinesiophobia, Tampa, Exercise, Fear.

REHABILITATION AND OEDEMA MANAGEMENT FOR TENDON TRANSPLANTATION OF A PATIENT AFTER ALLOGRAFT SURGERY: A CASE STUDY

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Introduction: Nerve injuries, incision scars, multiple surgeries, post traumatic oedema and loss of movement are not rare conditions for the orthopaedic surgeons and the team.

Objectives: The aim of this study was to evaluate the efficacy of the treatment for the patient with multiple nerve injury and skin allograft after multiple tissue loss due to a car accident.

Method / Design: 70 years old female patient initially evaluated for finger, hand and forearm circumferences, range of motion and sensation and Nottingham Health Profile was applied. For the oedema management, manual lymph drainage, skin care, compression bandaging and exercises was used in the first phase (intensive phase). In the second phase, treatment continued with compression garment, skin care and exercises. Warmish whirlpool, traction, mobilisations, splinting for dynamic flexion of the metacarpophalangeal joints supported with compression pads and functional activity exercises included to manage the limitations of the wrist and hand joints. Initial evaluations were repeated after 45 days.

Results: During the initial evaluation, the patient had only 5 degrees of active thumb movement. There was a pitting oedema in the allograft area and also skin folds around the incision area. After 45 days, there was an increase for the active thumb movements, loosening for the passive range of motions and decrease for the skin folds. There was a significant decrease noticed for the oedema and difference was supported by the circumference measurements.

Conclusions: Application of compression bandaging and compression garments which do not cause movement limitation, supported with manual therapy and anti-oedema materials added splints could lead to an achievement for the management of oedema after orthopaedic injuries. In this case, swelling of the limb was decreased and that achievement maintained with the modalities used in the second phase, eventually patient was successfully prepared for tendon transplantation.

Keywords: peripheral nerve injury, rehabilitation, case study.

PRIMARY LYMPHOEDEMA WITH ISCHEMIC STROKE: A CASE STUDY

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Introduction: Lymphoedema can be accompanied with several cardiovascular diseases. In many cases secondary lymphoedema occurs after hemiplegia. Primary lymphoedema followed by a cerebrovascular disease or stroke is rare. Conservative treatment of lymphoedema mostly depends on external pressure applied by compression bandaging or compression garments. One of the main mechanisms behind the therapy is the external pressure working with the pumping effect of the muscles that eliminates the fluid at the interstitial space.

Objectives: The main objective of the study was to evaluate the effectiveness of the treatment of a patient with ischemic stroke after 25 years of diagnosed primary lymphoedema.

Method / Design: Patient consulted to our department with complains about the worsening of the swelling at his lower extremities who was 46 years old male with a primary lymphoedema diagnose history of 25 years. He survived an ischemic stroke 8 months prior. He was completed a 4 weeks neuro-rehabilitation session. Circumferential measurements, balance, Nottingham Health Profile, Beck Depression Scale and Lymphoedema Quality of Life Scale were applied for initial evaluation. He attended to our Complex Decongestive Therapy sessions for 6 weeks and discharged with a compression garment for maintenance phase.

Results: His first evaluation showed an oedema which was mostly affecting the right (hemiplegic) lower extremity. He was standing and walking about 10 metres independently. In the other hand, there was no active movement on his right ankle and foot. After 6 weeks of manual lymph drainage, skin care, compression bandaging and exercise, oedema found to be decreased significantly. A positive change for the other evaluation parameters was also recognised.

Conclusion: Despite the fact that our patient had no active muscle contraction below knee level, complex decongestive therapy thought to be affective on primary lymphoedema.

Keywords: Case study, stroke, primary congenital lymphedema.

COMPENSATING AND ASSISTING IMMUNOLOGICAL REACTIONS IN SECONDARY LYMPHEDEMA

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Introduction: Bone marrow, spleen and central nervous system have no lymphatics. But they are not especially disordered in immunity,
Mallon SM et al. (Lymphol. Suppl. 31: 522-523, 1998) showed DNCB's elicit reaction is the same in the lymphedematous patient's extremity and the normal one if the sensitization is performed on the normal skin.
Sugaya M. (Annual Meeting of Jap. Society of Lymphol., 2015) reported in immunological experiment for animal edema antigen-sensitized T cells are null in the lymph node but elicit erythema is sometimes stronger and remains longer than the control.
All the above suggest there are some compensating and assisting reactions in immunity in lymphedema patients.

Result:
1. Contact dermatitis due to compressions bandages is seen in 1 out of 500 patients for chemical fiber materials and 0 out of 500 patients for cotton material (Ohkuma).
2. Tissue clearance tests in lymphedema shows one hyperfunctioning lymphatic out of 4 disturbed functioning ones in average secondary lymphedema patients (M. Ohkuma: Microcirculation Annual, 142-148, 1985).
3. In case of inflammation polymorph transposts antigen from the site to the bone marrow via blood circulation (Tomura M. Exp. Ed. 32:2694-2702, 2014). DC migrates into the lymph node(not regional!) via HEV(Ueha S et al: Exp. Med. 32: 2703-2709, 2014).
4. In daily life of lymphedema patients antigen gets into the body via respiratory, alimental and genito-urinary tracts as well as the normal skin (more size in the patient).
   Then the elicit reaction on the lymphedematous skin is as strong as the one on the normal skin. In seldom case sensitization goes on the lymphedematous skin alone.
5. Innate immunity is activated in the secondary lymphedema patients (Ohkuma M, 2015) which influences on cellular immunity.
6. Elicit reaction in PPD skin test on normal & lymphedematous skin is the one sencitized through repiratory tract or normal skin (BCG vaccination) in the past.

Conclusion: In daily life of secondary lymphedema patient an impaired immunity is compensated and assisted.

Keyword: Compensating immunology, secondary lymphedema.

KNOWLEDEGE AND AWARENESS ABOUT BREAST CANCER AND LYMPHEDEMA

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Introduction: Breastcancer is the most common cancer in women worldwide as well as in Turkey in women. In Turkey, each year approximately 15000 people have diagnosed with breast cancer.

Objectives: The questionnaire about awareness of breast cancer consisting of 32 questions that has been conducted after literature review.

Method/Design: www.farkindaolkendinikoru.com through Google Forms has been used to inform participants take attention of breast cancer. The questionnaire spread out by social media. 385 participants answered the questionnaire.

Results: Age of participants was 29,6±9,39 years. 330 are women and 55 are men. 86,3% of participants have bachelor's degree. 31,2% of them have never done Breast Self Examination (BSE), 34,8% do BSE after every shower, 25% in a month, between 5-7. days of the menstrual period. 19,2% thinks that men couldn't have breast cancer. Also, 47,4% thinks that the most common ages are 40-49 years for breast cancer and 92,8% thinks that breast cancer can be cured. The most important result indicated that 53,2% of participants have no information about lymphedema.

Conclusions: This study shows that knowledge regarding breast cancer knowledge was insufficient. Participants do not take the necessary precautions for early diagnosis and most of them have not information about lymphedema. Explain the importance of early diagnosis of breast cancer and should be given training to enable them to make routine examinations. In conclusion, in our country, there is a need for training about breast cancer and possible complications related to it. This study highlights the need to organize an awareness campaignin our country through internet to promote breast cancer knowledge and its consequences like lymphedema.

Keywords: Breast cancer, Awareness, Lymphedema.

EFFECT OF KINESIO TAPING ON BALANCE AND QUALITY LIFE IN CHRONIC VENOUS INSUFFICIENCY PATIENTS: A PILOT STUDY

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Introduction: Kinesio Tex tape is a therapeutic tape that is applied with the Kinesio taping method and is theorized to increase circulation and subsequently improve muscle function. However, its effects on musculoskeletal impairment symptoms and quality of life in venous disease have been poorly investigated.

Objectives: The aim of this study was to investigate the effect of supporting calf kinesio taping on chronic venous insufficiency patients.

Methods: 20 people who had venous insufficiency diagnosis included into this study. Mean value of patients age was 50,09 years and body mass index scores was 30,93. Patients divided into 2 groups which are control (n=11) and taping (n=9). After patients demographic data were collected Nottingham health profile, Beck depression inventory, Visual analog scale, Venous Insufficiency Epidemiological and Economic Study-Quality of Life/Symptoms questionnaire, and Biodex balance system tests were applied both before treatment and 4 weeks after treatment. Both groups received compression stocking for venous insufficiency in addition to stocking taping group received calf taping twice a week for 4 weeks.

Results: There was no significant difference between groups for Nottingham health profile, Beck depression inventory, Visual analog scale, Venous Insufficiency Epidemiological and Economic Study-Quality of Life/Symptoms questionnaire, and Biodex balance system tests ($p>0,05$).

Conclusions: In this study there was no statically significant increase found in any of parameters. Kinesio taping didn't increased balance and didn't contributed venous insufficiency symptoms. Yet there was observable increase of patients quality of life symptoms. In original study 30 patient suggested for each group according to power analysis. We believe that with enough participant this study will contribute to the literature.

Keywords: Balance, Venous insufficiency, Kinesio taping, Quality of Life, Compression Stocking.

BREAST EDEMA FOLLOWING BREAST CONSERVING SURGERY AND RADIOTHERAPY – A PROSPECTIVE 3-YEAR STUDY

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Introduction: Measurement of local tissue water with tissue dielectric constant (TDC) can improve detection of edema after breast cancer treatment.

Objectives: To examine development of breast edema and subjective sensations during a 3-year follow-up in breast cancer patients treated with breast conserving surgery and radiotherapy (RT)

Method: Baseline measurements were made pre-RT in 120 patients, during and 3, 6, 12 and 24 months after RT, and after 3 years when edema were present at 2 years. Definition of breast edema was a TDC ratio ≥ 1.40 between the treated and healthy breast. Experiences of tightness, heaviness and pain of the affected breast were scored on a visual analogue scale (VAS) by the patients.

Results: The mean TDC ratios were increased to over 1.40 at end of RT and at 3 and 6 months post-RT. At the end of RT and at 3, 6 and 12 months post-RT a significant difference compared to the mean TDC ratios pre-RT was found ($p \leq 0.001$). The largest proportions of patients with breast edema (TDC ratio ≥ 1.40) were found at 3 and 6 months (63%) and the smallest proportions at two years post-RT (28%). No statistically significant difference was found between the groups of axillary dissection or sentinel node biopsy. The subjective sensations were each highest at end of RT and lowest at two years post-RT. Twenty patients (17%) had breast edema at 2 years, 16 were eligible for measurement at 3 years (mean TDC ratio 1,45) and 8 still had breast edema.

Conclusions: Cancer treatment related edema in the breast is very frequent at three to six months after RT treatment but decreases at one to two years, but are still present for a few patients at three years. The subjective sensations are scored highest at end of RT but decrease by time.

Keywords: Breast, surgery, radiotherapy, edema, TDC.

EFFECT OF THE DECREASED PHYSICAL ACTIVITY LEVEL ON QUALITY OF LIFE PATIENTS WITH LOWER LIMB LYMPHEDEMA

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Introduction: Patients with lower limb lymphedema experience symptoms of pain, swelling, tightness, and heaviness in their legs. These symptoms restrict activity participation and may cause poor physical activity level and quality of life.

Objectives: The aim of this study was to investigate the impact of decreased physical activity level on patients' quality of life.

Method/Design: Twenty-three female patients with primary and secondary lower limb lymphedema diagnosed with the mean age of 48.03±13.12 years. Patients were evaluated for quality of life with 'The Short Form (36) Health Survey' and for physical activity level and weekly MET expenditure with 'International Physical Activity Questionnaire- Short Form' (IPAQ-SF). The correlation between weekly MET expenditure and SF36 Quality of Life scores was performed by means of Pearson correlation analysis. Primary lymphedema and secondary lymphedema groups were compared in terms of weekly MET expenditure and quality of life using independent groups t-test.

Results: Physical activity scores of quality of life 'physical function' ($r=-0.704$)* and 'physical activity total score' ($r=-0.563$)** were found to be correlated with MET expenditure *($p < 0.001$), **($p < 0.05$). No significant difference was found between primary lymphedema and secondary lymphedema groups in terms of weekly MET expenditure and quality of life. Quality of life of patients in physical activity IPAQ-SF class 1 and 2 were compared and it was found that the quality of life sub-group of 'physical function'* and 'physical activity total score'** were significantly higher in active individuals *($p < 0.001$), **($p < 0.05$).

Conclusion: Physical activity level of women with lower extremity lymphedema should be restricted due to both disease and treatment processes. Our findings suggest that limitation of their physical activity level is reflected in their quality of life.

Keywords: Lower Limb Lymphedema; Physical Activity; Quality of Life.

REHABILITATION MANAGEMENT OF POST-TRAUMATIC CHYLOTHORAX SEQUELA

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Introduction: We present a case report of a young woman patient who had a thoracic duct section secondary to delivery which required a thoracic duct ligation and later consultation in our outpatient due to residual thoracic pain and dyspnea MRC III after serial bilateral talc pleurodesis and chlylous ascites paracentesis.

Objective: Approach to lymphatic thoracic pathology with respiratory rehabilitation and myofascial manual therapy.

Method: Respiratory capacity evaluation by Ergospirometry - in order to study different parameters of dyspnea such a cause of dyspnea, cardiac function, pulmonary gas exchange, ventilation and physical fitness-, MIP-MEP, and 6MWT for the functional capacity appreciation before and after de treatment. We proceed to reeducate the ventilation static and dynamic pattern, an incremental training of inspiratory musculature by Threshold breathing device. Also, muscular fascias have been worked in order to improve patient's diaphragmatic hypertonia. In a second phase, we designed an effort retraining plan that involved aerobic intervallic exercise and supervised muscular potentiation.

Results: Improvement in respiratory parameters in both Spirometry and MIP/MEP exam, as well as a global improvement in functional capacity after the treatment.

Conclusion: We found that training respiratory and peripheral musculature and treatment of muscular fascias are both useful to control respiratory symptoms and improve physical readaptation in patients with chylothorax sequela.

Keywords: pulmonary rehabilitation, respiratory disorders, respiratory muscle training.

THE PERIKIT, REPRODUCIBILITY AND ACCURACY OF AN INNOVATIVE PORTABLE DEVICE TO MEASURE THE LIMB PERIMETER THROUGH A BLINDED STUDY

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Introduction: Taking accurate circumferential measurements in edema surveillance is essential for: monitoring the evolution of the edema, assessing its treatment, manufacturing of precise compression garments to increase the patient's compliance and decrease the waist of garments because of measurements inaccuracy.

Objectives: To test the reproducibility and accuracy concerning the reference point positioning and the circumferential measurements, using a novel portable perimeter kit (Perikit) device.

Method: 43 healthy subjects took part in this study. This choice can guaranty that no bias of edema variability is possible and that any change in the measurement even of 1 mm is considered as a measurement inaccuracy and not a measurement variability. The measurements were taken on the upper limb each 4 cm beginning with a reference point on the wrist joint. The measures were retaken independently within 1 hour. The Perikit consist in a graduated adaptable guide installed longitudinally on the limb on which sliding devices (sld) are installed. On the first sld, a tapeline is fixed to take circumferential measurements and on the second sld, a brake system is fixed to stabilize the mechanism. Each sld is equipped with an aperture to read precisely the distance where the measurement is taken.

Results: Concerning the circumferential measurements, the interclass correlation (ICC) was 0.99 . The Bland and Altman test confirmed the reproducibility of the system. Concerning the reference points taking/retaking, no statistically different changes were noticed between the first and the second assessment.

Conclusions: The Perikit shows a high degree of reproducibility and accuracy with major advantages:

– 97% of the measurements taken showed a difference between 0 and 3 mm.
– High precision in retaking the bony landmark reference point that is fixed on the joint as well as the other landmarks and the mean difference was less than 2 mm. It solved the classic error of inaccuracy accumulations that can occur between each 4 cm, because the Perikit stays on the limb during the whole procedure.
– No tension is put on the tapeline by the assessor, so the risk of affecting the accuracy is minimized.
– The Perikit can adapt to any shape and length of any limb. -No ink marks on fragile skins are used, so the risk of abrasion followed by infection is solved.

Thanks to these advantages, the Perikit can be considered nowadays as a reliable and practical measurement technic that can be used everywhere.

SELF MANAGEMENT HOME PROGRAMME FOR PATIENTS WITH LOWER LIMB LYMPHEDEMA

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Introduction: Lymphedema results from insufficient lymphatic drainage and typically affects the extremities leads to physical discomfort and functional impairment. Complete decongestive physiotherapy (CDP) is the most important element in the treatment and long-term management of mild and moderate and lymphedema. Although effective, CDP is criticized as being time consuming, costly, and under-researched.

Objectives: The purpose of this study is to describe the effect of the self management home programme (HP) on patients with lower limb lymphedema.

Method/Design: Seventy lower limb lymphedema patients mean age of 49.11±12.53 years were allocated randomly and assigned to either a CDP group (n=35) or HP group (n=35). The CDP group received manual lymphatic drainage, compression bandages, active range of motion exercises, from a trained physiotherapist 3 days a week for 4 weeks. HP group recieved self lymphatic drainage, compression bandages, active range of motion exercises. Compression bandages applied from their care givers. All care givers trained how to apply compression bandages. Patients were educated on the warning signs and symptoms of inappropriate application of compression bandages. They controlled once-weekly at clinic. Health related quality of life was mesured by Short-Form Health Survey, 36 items (SF-36). Measurements were taken at baseline, and at 4th weeks after the start of intervention. Lower limb circumferences measurments compared by Mann-Whitney-U test.

Results: We observed significant difference in both groups when comparing them before and after therapy. The volume reduction of CDP group was 67.7% and In HP group was 63.2%. There was no significant difference between the groups ($p>0.05$). SF-36 scores was not differ significantly between the groups.

Conclusions: For selected patients with lower limb lymphedema, a self management home programme can be a route to lymphedema reduction, independence, and self-efficacy.

Keywords: Lower Limb Lymphedema; Complete Decongestive Physiotherapy; Home Programme; Self Care; Quality of Life.

A RARE CASE OF LYMPHEDEMA IN A KLIPPEL-TRENANAUAY SYNDROME PATIENT

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Introduction: Klippel-Trenaunay Syndrome (KTS) is an uncommon congenital angiodysplasia that manifests in infancy and is characterized by venous and lymphatic malformations of the skin, soft tissue, and bone causing limb hypertrophy. Management of this syndrome is focused primarily on treatment of the complications that arise from these malformations. Due to the wide variety of malformations and their manifestations, KTS patients are typically treated by multidisciplinary teams of caregivers

Objectives: The management of a rare case of lower limb lymphedema in a patient with KTS.

Case: A 14-year-old female was admitted to our hospital with the lower limb lymphedema. The patient's medical history included right lower extremity mild lymphedema and visible vascular changes (port wine stain) that differed from the left lower extremity. There wasn't any limb hypertrophy and length difference. She described as heaviness, then burning which improved with leg elevation and compression. She hadn't any trauma history. She had a history of cellulitis many times in the leg that had been treated by antibiotics one year ago. After that her extremity started swollen. She hadn't receive any treatment before. Lower limb circumference measurements were taken 4 cm intervals by tape from toe to groin. Physiotherapist evaluated this patient and planned complete decongestive physiotherapy three times a week for six week. After intensive therapy a custommade compression garment was recommended. The patients were advised to do exercises at home. Before treatment intervention lower limb volume was 591391.63 ml. After six week measurments limb volume was 3026.45ml. Her treatment is still ongoing.

Conclusions: KTS is a syndrome characterized by varicose veins, hypertrophy of the soft tissues and bones, hemangiomas, lymphedema and an absence of arteriovenous macrofistulas. Management of this syndrome is focused primarily on treatment of the complications. Thus, a clear protocol for investigating and managing KTS patients is needed.

Keywords: Klippel-Trenaunay Syndrome; Lower Limb Lymphedema; Physiotherapy.

SAME LYMPHOEDEMA, FOUR DIAGNOSTIC?

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Introduction: Primary lymphatic dysplasia associated to growth disorders are an uncommon entity with a low prevalence. Genophenotypic classification impulsed by Connell et al. in 2010 has been helpful to group a large variety of clinical manifestations of Lymphoedema for its better understanding.

Objective: Reflection on applicability of genophenotypic classification as a help for clinicians, confusion factor, or the top of the iceberg.

Case report: We present a case report of a 10 years old male kid, born in 2006, who at moment of birth was found to have an edema on the dorsum of his right foot, diagnosed initially as a Milroy Disease. Later, a half hypertrophy began to manifest and patient was diagnosed a Half hypertrophy with Hemangiolinfangiosis syndrome, in 2008 as a Parkes Weber's Syndrome, which became a Klippel-Trenaunay Syndrome in 2009 after appearing a cutaneous vascular malformation in gluteus area. When the patient arrived to our medical office half hypertrophy with Hemangiolinfangiosis syndrome free of visceral affectation was the main diagnosis. An abdominal vascular mass and intestinal lymphangiectasia were detected in 2014, leading to a final diagnose, Multisegmental Lymphatic Dysplasia with visceral involvement, with an ulterior founding of lymphangiomas at the contralateral side of body which was supposed to be free of disease. The possibility of evolution into a Generalized Lymphatic Dysplasia is still study pending, waiting for genetics results this year 2016, by analyzing the presence of CCBE1 gene.
Is this evolution the natural history of the disease? What happens in multisegmental lymphedema feature?

Conclusion: Multisegmental lymphatic displasias with or without alterations of growth have variable medical prognoses, that entails a degree of uncertainty for both the family and clinicians when initiating a systemic treatment; thus we need to use complementary lymphatic diagnostic techniques for early detection and multidisciplinary action committees.

Keywords: Congenital lymphedema, international classification of primary lymphatic dysplasia, overgrowth syndromes.

EFFECTS OF A SHORT EXPOSURE TO MULTIDIRECTIONAL VIBRATIONS (ANDULLATION®) ON LYMPHATIC SYSTEM AND SKIN MICROCIRCULATION IN MICE

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Introduction: Physiological effects of Whole Body Vibration are intensively studied in medical fields.

Objective: To examine the short time effects of multidirectional vibrations (delivered in horizontal position) on the lymph node dye accumulation and skin microcirculation in mice.

Methods: Part 1: Mice were randomly allocated to three groups: Whole Body Vibrations (30 Hz, 3 minutes) (N= 15); manual massage (3 minutes) (N = 15) and a control group (N= 10). Interventions were applied after 20 µl footpad injections of Evans blue dye (EBD). Dye quantity determination (µg) in the popliteal nodes was assessed by spectrophotometry (620 nm).
Part 2: Different periods of vibrations (3, 6 and 10 minutes, 30Hz) were locally delivered in a horizontal position on the abdominal skin in 3 randomized groups of mice (N = 42). All groups were compared to a control group (N = 14). The 'in vivo' measuring of the arterial and venous diameters was done before and after each vibration period.

Results: Part 1: After vibrations, the quantity (mean±sd) of EBD in popliteal nodes was found higher in the WBV mice than in the control or massage groups (respectively, 0.56 ±0.26, 0.14±0.17, $p<0.05$, 0.22±0.16, $p<0.05$).
Part 2: Average venous diameters after 6 to 10 minutes of vibrations were significantly increased (7 and 12%, p-values 0.026 and 0.013), while 3 minutes did not significantly influence average venous diameters. Arterial diameters did not significantly vary after 3, 6 and 10 minutes. As for the placebo group, variations of arterial and venous diameters during 10 minutes were not significant.

Conclusions: Lymph node dye accumulation is better after a short vibrations exposure than without intervention or with injection site massage.
Vasodilatory effect of low frequency vibrations was demonstrated. An endothelium "shear stress" induced by "skin massage" is retained as hypothesis and generates local venous vasodilation and local subcutaneous blood flow increase.

Keywords: Horizontal vibrations, Lymph nodes, Dye accumulation, Spectrophotometry, Microcirculation, Shear stress.

CONSERVATIVE VERSUS MICROSURGICAL TREATMENT OF BREAST CANCER RELATED LYMPHEDEMA

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Introduction: Breast cancer related lymphedema (BCRL) is one of the most common and debilitating complications following breast cancer treatment. Since complex physical therapy (CPT) does not always offer the desired symptom reduction, microsurgical lymph node transplantation (LNT) and/or lympho-venous anastomoses (LVA) may restore lymphatic function, resulting in a possible long-term solution for BCRL.

Objectives: To determine whether microsurgical treatment, LNT and/or LVA (with or without breast reconstruction using the deep inferior epigastric perforator (DIEP) flap), lead to an improvement in health related quality of life (HRQOL) and arm volume reduction. Lympho-liposuction (LLS) was also included as surgical intervention to treat BCRL. Outcomes are compared with a control group of breast cancer survivors with BCRL who were treated with CPT, for a follow-up of one year.

Design / Method: A prospective longitudinal cohort study. Between January 2013 and February 2016, 49 patients suffering from BCRL and resistant to CPT were included in the intervention group. Patients were treated with breast reconstruction and LNT; with an end-to-end LVA; with LNT; with LVA in combination with LLS; with LVA in combination with LNT; with LVA in combination with a breast reconstruction; with LNT, LVA and a breast reconstruction; with LLS or with LVA, LNT and LLS. A control group of 46 patients was treated with CPT. The evolution of HRQOL was measured using the ULL-27 questionnaire and the progression of BCRL was assessed using the Perometer for a follow-up of one year.

Results and Conclusions: The preliminary results and conclusions of this study will be presented at the congress. By the time of the presentation, 34 patients of the intervention group and 31 patients of the control group will have a follow-up of about one year.

Keywords: breast cancer related lymphedema, microsurgical treatment, conservative treatment, health related quality of life, arm volume.

THE DISTINGUISHED ANATOMIST MILTIADES PAPAMILTIADES (1907-1987) AND HIS LEADING WORK IN LYMPHATICS

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Introduction: Miltiades Papamiltiades, Professor of Anatomy in the Medical School of Athens, Greece, devoted his scientific work in the field of anatomy, histology and cytology. His contribution in the study of lymphatic system is considerable.

Objectives: To reveal the work of Miltiades Papamiltiades in the study of lymphatic system, as well as, its impact in our current knowledge.

Method: The primary sources of his work were analyzed according to our current knowledge on this field and his work on lymphatic system was revealed.

Results: Papamiltiades' work in lymphatic system merits our attention. He was the first to describe the lymphatics of the pulmonary artery in man, together with their efferent and nodal connection; he gave a description of the distribution of the lymphatic network in the nasal mucosa; he studied the anatomical disposition of lymphatic networks of the heart; he invented a new staining technique, currently known as Papamiltiades staining and discovered an injection method for the investigation of the lymphatic vessels, contributing to the understanding of the role of the lymphatic system in metastases.

Conclusion: Professor Miltiades Papamiltiades was a renowned scientist and his research on lymphatics remained classic, promoting hislegacy till nowadays.

Keywords: lymphatic system, history of medicine, Papamiltiades.

SAFETY AND EFFICACY OF MOBIDERM® AUTO-ADJUSTABLE NIGHT ARM SLEEVE (AUTOFIT®) IN THE MANAGEMENT OF UPPER LIMB LYMPHEDEMA: MARILYN TRIAL

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Introduction: Rebound effect after Decongestive Lymphedema Therapy (DLT) is often observed in the following months in patients with Breast Cancer Secondary Lymphedema (BCSL).

Objectives: The objective of this proof of concept study was to assess the safety and efficacy of Autofit®, as a night treatment for maintenance phase, after DLT.

Methods: Autofit® (THUASNE) is an auto-adjustable night garment made by the Mobiderm® Foam.
40 patients with BCSL, stage II or III, were recruited. After the DLT, patients were randomized in:

Group I: night-time Autofit(R) during 90 days,

Group II: no night treatment during 30 days, then night-time Autofit(R) during 60 days.

All patients were also equipped with the same day time lymphology hosiery (THUASNE). The primary endpoint compared upper limb volume excess variation (Volume difference between affected and healthycontralateral arm), between D0 and D30.

Results: The median volume excess variation between D0 and D30, was slightly higher in group II than in group I: 3.22% vs 1.80% respectively, p=0.904 (NS).
At D90, 80.7% of the benefit of DLT was preserved in Group I wearing the Autofit(R) vs 54.9% in group II.
Subgroups assessments suggest that response to the Autofit(R) night garment may be influenced by DLT response. Detailed results will be discussed during the presentation.

Conclusion: After an intensive DLT, Autofit(R) Night armsleeve, displays maintenance properties that are beneficial for patients with BCSL with a safety profile.

Keywords: Lymphedema, Arm sleeve, Treatment, Compression, Medical device.

PERCUTANEOUS SCLEROTHERAPY OF LYMPHORRHEA USING POVIDONE-IODINE

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Purpose: Lymphorrhea is a possible complication after trauma, lymphocele, surgery and biopsy. Their treatment is considered to be as less traumatic as possible because it is intended for patients already operated. We propose the efficacy of the percutaneous sclerotherapy of lymphorrhea using povidone-iodine.

Materials and Methods: We studied 5 patients, 3 men and 2 women aged from 32 to 72 years who presented lymphatic fistula (LF) with lymphorrhea: the first after radical prostatectomy, one after breast cancer surgery, 2 after vascular surgery on the inguinal region and the fifth on the thigh after melanoma surgery.
We have treated all the patients by local medical care, compressive dressing and percutaneous sclerotherapy using povidone-iodine.

Results: The evolution was favorable with complete but late closure of the fistula in the 5 patients. Multiple sclerosis were necessary to close the lymphorrhea.

Conclusion: In certain cases, the treatment of choice of the LF with lymphorrhea would possibly be the percutaneaous sclerotherapy using povidone-iodine.

Keywords: Lymphorrhea, Povidone-iodine.

STEWART-TREVES SYNDROME: A CASE REPORT

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The Stewart-Treves Syndrome is defined as an angiosarcoma (very aggressive malignant tumor originating from endothelial cells) appearing in a specific clinical setting. This tumor develops in patients suffering from chronic lymphedema of upper limb following breast cancer, but a small number of cases arise lymphedema of the lower limb. We report a case of Stewart-Treves Syndrome in the right lower limb in one woman (42 years) with chronic primary Lymphedema associated with story of repeated erysipela episodes.

Kewords: Lymphedema, Stewart-Treves Syndrome.

PSEUDO-LYMPHEDEMA IN MUNCHAUSEN SYNDROME: A CASE REPORT

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Munchausen syndrome is a condition in which a person intentionally fakes, simulates, worsens, or self-induces an injury or illness for the main purpose of being treated like a medical patient. Munchausen syndrome is named after a German military man, Baron von Munchausen. We report the case of one woman, 36 years old who presents an edema and pain of the right hand without trauma. Biological examination was norrmal, Doppler ultrasosund did not identify venous and arterial complaint. The patient was treated by MLD and compressive garment with favorable evolution. Four months later, she returns with the same edema, she provoked the symptoms using a tourniquet effect at the wrist. Our patient was lost to follow-up.

Keywords: Pseudo-Lymphedema, Munchausen Syndrome.

CIRCAID®: PRESSURES REPRODUCIBILITY WITH BPS® GUIDE CARD (BUILT-IN PRESSURE SYSTEM)

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Introduction: Circaid® garment is proposed as a unique layer inelastic bandage in self-treatment to patients suffering from a secondary arm lymphedema after breast cancer. The pressure can be adjusted to different levels with the help of a device called Built-in Pressure System (BPS® guide card).

Objective: The purpose of this study is to analyze the reproducibility of the pressures achieved under Circaid® arm garments with the help of BPS®.

Methods: Six pressure sensors were placed (anterior wrist face, each forearm faces (4), anterior arm face) of 10 healthy young women. Pressures, pressure gradients at rest, and Dynamic Variation Pressure Indexes (DVPI) during standardized muscular contractions were recorded under the Circaid® garments. Five different pressure levels were selected (10, 20, 30, 40 and over 40 mmHg). The global uncertainty and the reproducibility of the pressures under Circaid® obtained during the resting phase were also calculated at the same five pressure levels.

Results: The use of BPS® guide card, allows to reach, at wrist level, resting pressures close to the wanted pressures (mean and sd, respectively at the five pressure levels: 7±3.8, 13.45±5.7, 21.5±5.2, 25±8.7, 50.4±8.2 mmHg). It allows also to set up a Digressive Pressure Gradient (DPG) on the whole limb (mean and sd of DPG between wrist and forearm, respectively at the five pressure levels: 0±4, -4±6, -9±4, -11±7.5, -17.5±11 mmHg). The pressure variations measured during the muscular contractions and the reproducibility of the pressures obtained, are increased when the wanted pressures are equal or higher than 30 mmHg (mean and sd of DVPI and coefficient variation for reproducibility (%) at the forearm 40 mmHg pressure selected level: 14±3 mmHg and 12.85%).

Conclusion: The pressure adjustment system proposed with Circaid® allows an easy and safe patient' self-management of the therapeutic pressures and pressure gradients which are wanted for secondary upper limb lymphedemas' treatments.

Keywords: Velcro compression device, BPS® guide card, pressure gradient, Dynamic variation pressure index.

PRESSURES EXERTED BY CIRCULAR OR FLAT KNITTED ARM SLEEVES DURING SIMULATED MUSCULAR CONTRACTIONS

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Introduction: Elastic medical compression garment is an essential component in the treatment of breast cancer related lymphedema.

Objective: The aim of this study is to determine which type of compression arm sleeve, flat knitting (FK) or circular knitting (CK) compression class II exerts the highest pressures during simulated muscular contractions and during a resting period.

Methods: This experiment was conducted on a simulated upper limb. The pressures were measured under the different compression arm sleeves at two different selected points. The measures were done before and while simulated muscular contractions were applied on the limb. The contractions were obtained with the help of a small inflatable air chamber fixed on the simulated limb.

Results: The mean recorded pressures under the arm sleeves was statistically higher ($p= 0.034$) with FK (25 mmHg) than with CK (18 mmHg) at the location of the small air chamber. During simulated contractions, maximal measured pressures average was also higher ($p= 0.0003$) with FK (36 mmHg) than with CK (24mmHg) at the same location. In vitro Dynamic Variation Pressure Index (DVPI), which represents 'local massage effect' during simulated muscular contractions was also assessed. DVPI under FK (19,5 mmHg) is also statistically higher ($p<0.0001$) than DVPI of CK (11 mmHg).

Conclusion: The results confirm the importance of the knitting's type when choosing for a compression sleeve and no longer solely the compression class. Considering the same upper limb, FK seems to exert more pressure and to induce more 'local massage effect' during muscular contractions, due to a higher stiffness of the flat knitting.

Keywords: Circular or flat knitted arm sleeves, Simulated muscular contractions, Local massage effect, Dynamic variation pressure index, Simulated forearm.

PATIENT'S BENEFIT, SATISFACTION AND QUALITY OF CAR FROM PATIENTS PERSPECTIVE WITH DIFFERENT TREATMENTS FOR LYMPHEDEMA: PILOT STUDY

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Introduction: Lymphedema management primarily includes manual lymph drainage, compression therapy, skin care, and physical exercise and pneumatic compression devices. Patient-relevant benefit of edema treatment is usually measured using health-related quality of life instruments. The methodology of Patient Benefit Index-Lymphedema allows for a more direct measurement, with the patients rating both importance and achievement of treatment goals.

Objective: The aim of this study was assessment of patient's benefit, satisfaction and quality of care from various lymphedema treatments.

Method/Design: 34 female 18 male patient who had lower limb lymphedema recuited to the study. 43 patients received complex decongestive physiotherapy, 4 patients received self dranaige and exercise and 5 patients received pneumatic compression treatment. Benefit from their perspective was evaluate with Patient Benefit Indeks-Lymphedema. Quality of care and satisfaction from treatment was evaluate with Visual Analogue Scale. Patients were evaluated before and after 4 week treatment. Statistical tests were performed using Kruskal Wallis and Mann whitney U tests.

Results: When PBI-L scores was compared, there was no significant difference between groups($p>0.05$). Quality of care scores were significantly higher in complex decongestive physiotherapy group ($p=0.02$). When satisfaction from treatment scores were compared, there was no significant difference between groups ($p>0.05$)

Conclusions: All patients were benefitted from lymphedema treatments. Complex decongestive physiotherapy which is gold stardart in lymphedema treatment should be the first choise for many patients because of quality of care, no side effect and effectiveness.

Keywords: Patient Revelant Outcome, Complex Decongestive Physiotherapy, Quality of Care, Lymphedema.

EFFECT OF COMPLEX DECONGESTIVE PHYSIOTHERAPY ON KLIPPEL TRENAUNAY SYNDROME: CASE REPORT

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Introduction: Klippel Trenaunay Syndrome (KTS) is an unusually seen syndrome with typical combination of soft tissue or bony overgrowth, dermatological vessel abnormalities, and assosiated venous capillary or lymphatic malformations. Management is normally conservative and include stocking for compression, pneumatic compression to reduce edema and rarely surgical correction of varicose veins.

Objective: The aim of the study was assess the efficacy of complex decongestive physiotherapy for treatment of Klippel Trenaunay Syndrome.

Method/Design: 24 years old female patient with complaints lymphorea, pain and tightness in left lower extremity admitted our unit. She had pathologic changes in her lymphosyntigraphy and venous doppler ultrasound. Edema was evaluated with Leg Q meter. Quality of life was assessed with LymQoL, Nottingham Health Profile and Venous Insufficiency Epidemiological and Economic Study-Quality of Life. Pain was assesed with Visual Analog Scale.

Results: LymQol, Venous Insufficiency Epidemiological and Economic Study-Quality of Life, Nottingham Health Profile scores before treatment were 1,73, 84 and 101,35 and after treatment scores were 1,63, 71 and 36,8 respectively. According circumference measurement there were decrease in metatarsophalangial joint (1 cm), ankle joint (1,2 cm), achille tendon region (0,5 cm) which were more problematic for patient. Also lymphorea was decreased from baseline. There was 6 cm decrease in visual analog scale.

Conclusions: Complex decongestive physiotherapy was effective in improving quality of life, decreasing pain, edema and lymphorea.

Keywords: Klippel Trenaunay Syndrome, Complex Decongestive Physiotherapy, Quality of Life.

A WIDER UNDERSTANDING OF THE HOMEOSTATIC ROLE OF THE LYMPHATIC SYSTEM

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The tissue construction is named histogenesis. The original histogenesis leads in the embryo to the organ development. Defects on the original histogenesis, leads to defective organogenesis that are known as malformations. The mature tissues renovate on a regular basis depending on characteristics that typical of each particular tissue, and the enviroment where cells lives. When this process of renovation fails, the imperfect histogenesis lead to the developement of a tumor. Sometimes the histogenesis is part of the wound repair. If wound repair is complete we call it "restitutio ad integrum". If the histogenesis is not perfect, we get a scar.
Finally the enviromental conditions where celullar lives are keep between tight margins through mechanisms known as homeostasis. However the processes of repair, regeneration, mantainence of celullar, and tissues structures have very small defects that can accumulate through life time. The consequence of the accumulation of errors is known as aging. So, malformations, tumors, scars and aging can be assimilated as displasias, imperfect histogenesis. They share molecular and biological processes. The lymphatic system plays a key role in the homestatic process, in the mantainance of the quality of the intersticial environment. We can understand the mantainence of the structural quality of the tissues as part of the homeostatic as well. The capilar endothelial lymphatic cells are closely involve with both processes.

Keywords: Displasia, malformation, tumor, scar, aging.

METHODOLOGICAL MISTAKES ON MLD ANALYSIS

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An attempt to understand the relative value of MLD in the context of CDT, suggests that there are no statistically significant differences between the intervention and the control groups. Nevertheless, due to study limitations in design and sample size, most studies must be rated as "effectiveness not established". Furthermore, these works, which can be considered well done, can be objected too. First, and hard to be said in public, is that, maybe, MLD may be performed incorrectly. Second, the scientific method establishes some conditions that are ok for the analysis of simple interventions, but wrong for complex interventions.
The cientific method demands the randomization of patients and intervention assignation, and the variable of intervention's homogenity. To do all patients MLD the exactly same manner, for the same lapse, everytime, constitues malpractice.
Adaptability is an inherent characteristic of MLD, and is mandatory in a well done treatment. Each patient, in each session, deserves the proper treatment, that is, a unique MLD. Homogeneization of the intervention's variable MLD constitues a methodological mistake. In an attempt to find a solution to that situation, from a methodological perspective, including in analysis the variability that's part of MLD, the homogenity must be emphazised not in MLD but in the therapist's quality.

Keywords: MLD, CDT, Cochrane, complex intervention.

FUNCTIONALITY AND QUALITY OF LIFE RELATED TO HEALTH IN PATIENTS WITH VENOUS EDEMA

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Introduction: Chronic venous insufficiency is characterized by venous hypertension which interferes with venous return due to alterations of the venous wall and the valvular incompetence.

Objective: Evaluate the functionality and quality of life in patients with venous edema of the lower limbs by chronic venous insufficiency.

Methods: A cross-sectional, comparative and correlational study was conducted with 50 subjects, 24 in edema Group and 26 participated in the Control Group. Quality of life was assessed by Short Form Health Survey 36 version 2 and Chronic Venous Insufficiency Questionnaire, the severity of chronic venous insufficiency by Venous Clinical Severity Score, the Tinetti balance test, the walk speed by ten meter walk test, strength of ankle plantar flexor muscles and range of motion by Biodex isokinetic dynamometer system pro 3.

Results: Compared to the Control Group, edema Group reveals worst results in quality of life (P = 0.000) and balance (P = 0.000). It was also found that edema Group walk speed tends to increase with the increase of peak torque, peak torque/ body weight, total work and average power 60°/s, and with peak torque and peak torque/ body weight 120°/s. However, no statistically significant differences (P>0.05) were found in walk speed and physical parameters. No correlations between balance with physical parameters, no significant correlations between physical and functional parameters with the clinical severity of chronic venous insufficiency and venous edema (P>0.05) were found.

Conclusion: Quality of life and balance are decreased in edema Group compared to Control Group, but it does not differ in walk speed, plantar flexor muscle strength or ankle range of motion. Edema Group walk speed improves with the ability to produce plantar flexor muscles strength and ankle range of motion. However the severity of the disease does not influence the physical and functional parameters.

Keywords: Venous Muscle Pump; Venous edema; Balance; Functionality and Walk.

EVALUATION OF TIME-DISTANCE PARAMETER CHANGES OVER THE YEARS IN PATIENT WITH PRIMARY LYMPHEDEMA - A CASE REPORT

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Introduction/Objectives: Lymphedema is a chronic disease. The patient has to use the garment during his life. The aim of this case report is to evaluate walking ability with gait analysis for the patient with unilateral primary lymphedema. Data obtained with the gait assessment at the motion analysis laboratory. This case report describes the differences of walking ability and gait parameters for three years follow up.

Method / Design: Our subject was a 13 years old child with unilateral lower limb primary lymphedema. The patient was measured for three years after the treatment with garment. The measurements were taken in Istanbul Faculty of Medicine, Motion Analysis Laboratory by using gait analysis laboratory. Step width (mm), cadence (step/min) and mean velocity (m/sec), velocity (m/sec) right and left foot were analyzed as system program.

Results: Time-distance parameters were evaluated. After the treatment, the subject was evaluated for each year for three years. There was %7.35 difference for step width parameter between first and three years later. There was %11.65 difference for cadence and %35.48 difference for mean velocity parameter. For the first year there was %3.19 difference for velocity between right foot and left foot. For the third year there was %1.60 difference for velocity between foots. By comparing walking for the first and second evaluation step width decreased, cadence, mean velocity, and velocity for right and left foot were increased over the years.

Conclusion: Our findings can explain that walking ability and walking parameters can improve after the treatment over the years. Walking with garments can increase balance. Because step with is associated with balance and its decreased as the patient walking with garments. We need more clinical researches with more patient outside of only one case report.

Keywords: Lymphedema, gait analysis.

COMPLEXITY OF THE MANAGEMENT OF MICROCYSTIC LYMPHATIC MALFORMATIONS ASSOCIATED WITH SYNDROMIC VASCULAR MALFORMATIONS: 2 CASES REPORT

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Lymphatic malformations are classically categorized in two groups: macrocystic lymphatic malformations (cystic hygroma and hygroma cysticum) and microcystic lymphatic malformations (MLM) (lymphangioma circumscriptum). Microcystic forms are characterized by clear or haematic vesicles. They may concern the entire body skin surface or mucosae but also the thoracic and abdominal viscera accounting for diagnosis and therapeutic challenges. The Microcystic forms may also be associated with more complex vascular malformations, syndromic and non-syndromic, complicating their therapeutic management. We report two cases illustrating the complexity of this setting. The first patient was a 27 year-old male suffering from a Klippel-Trenauney syndrome of the right lower limb involving hypertrophy, slow flow venous malformation and port-wine stains. This vascular malformation was accompanied by a 20 cm^2 MLM of the homolateral inguinal region. The patient's main disability was represented by a daily permanent lymphatic effusion flowing from MLM. This lymphatic malformation was scalable with progressive extension of the MLM along the medial side of the limb, parallel to the venous malformation. The large surface involved and the rapid expansion, without macrocystic malformation contraindicated surgery and sclerotherapy. The carbon dioxid laser (CO2) was refuted because of the inguinal location and patient's reluctance. The second patient was a 38 year-old male. He suffered from an unusual Proteus syndrome with abnormal trunk fat distribution with dysmorphic hypertrophic fat and distal bone defects of the 4 members as well as digito-palmar and digito-plantar deformities. Fat trunk hypertrophy was associated with a slow flow vascular malformation involving subcutaneous venous thoracoabdominal malformations and port-wine stains. The patient was incapacitated by weekly bleeding and monthly infections complicating MLM despite medical treatment combining rigorous well conducted hygiene, antibiotics and anti-inflammatory drugs. Surgical treatment failed 10 years ago as a consequence of the extended surface of the MLM (more than 100 cm^2). The presence of vascular malformations complicates the surgical management of MLM. Furthermore, sclerotherapy is not suitable in these diffuse microcystic forms. More recently, carbon dioxid laser (CO2) has been used and was ineffective, showing early recurrence. Large MLM areas associated with complex vascular malformations have more frequent complications and particular evolving characteristics. Unfortunately, they remain difficult to treat exposing patients to early recurrence risk in the absence of long-lasting therapeutic options.

EFFECT OF COMPRESSION ALONE OR COMBINED WITH EXERCISE IN PATIENTS WITH LIPEDEMA. A PILOT STUDY

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Introduction: In lipedema patients, the treatment with compression and exercise is based on clinical experience.

Aim: To assess the efficacy of compression garments and the effect of aerobic exercise in lipedema volume and in Tissue Dielectric Constant (TDC).

Methods: Experimental prospective cohort study of lipedema patients in 3 phases:
– Washing period: 72 hours.
– Phase2: Compression panties, circular-knitted, ccl2, during 1 week.
– Phase3: one session of aerobic-supervised-exercise plus compression.
Inclusion criteria: clinical diagnosis of lipedema, age: 18-40, stages I-II and consent to participate.
The endpoint was the volume reduction. Volume was measured using Kunhke formula.
The TDC were measured at foot, ankle and lower leg bilaterally, using a handheld device MoisturemeterD® (Delfin Technologies Ltd, Finland), and subjective assessment with Visual Analogic Scale.

Results: To date, eight patients from a population of 104 lipedema patients were recruited. The median age was 30.5 years (range:18.8-39.2); 62.5% were normal or underweight. At baseline, the mean volume was 12170ml for the right LL and 11883ml for the left LL. Patients complain from pain (3.7+2.1), heaviness (5.2+2.7), and numbness (2.2+2.3).
Effect of compression alone:
The compliance to compression was 12.1 h/d (95%CI:10.0-14.1).
Compression with garments significantly reduced the volume of the limb, mean:209 ml (p=0.038).
TDC at the foot and ankle did not show any difference, but TDC at the leg decreased with the use of compression.
Symptoms improved after compression, but only was statistically significant in heaviness (p=0.036).
Effect of exercise added to compression:
The mean of volume reduction was 313 ml, TDC at the ankle and the leg decreased, but did not reach statistical significance.

Conclusion: As far as we know, this is the first study that objectively demonstrates that compression alone or combined with aerobic exercise has benefits in the reduction of volume and symptoms in young patients with mild lipedema.

Keywords: lipedema, compression, exercise, pilot study.

PLACE OF ANTITHROMBOTICS IN LYMPHEDEMA OF LOWER LIMBS ASSOCIATED TO ERYSIPELAS

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Purpose: It is possible to determine the place of antithrombotics in the lower limb lymphedema (LLL) associated to an erysipelas ?

Materials and Methods: Between 2009 and 2015 we studies 14 patients: 8 women and 6 men, age ranging from 19 to 69 years old who presented LLL associated to an erysipelas. The diagnostic is determined on these criterion: Know LLL, low grad fever > 38.5 C°, high C-reactive protein (> 100 mg/l), redness, heat and pain of the leg with hyperleucocitosis. A duplex ultrasonography (DU) was done in day D0, D3, D7, D15 and D30. All the venous system from the ankle to the inferior vena cava is examined.
3 patients present sequella of deep venous thrombosis, 2 venous superficial insufficiency and one reactive cancer. The treatment included: antibiotherapy, early mobilisation without preventive antithrombotic.

Results: Despite that 6 of our patients present risk of venous thrombosis (VT), DU not showed acute VT in the lower limbs in all the 14 patients.

Conclusion: Due this partial results, we propose that the systematic preventive antithrombotic is not justified in patient with LLL associated to an erysipelas.

Keywords: Erysipelas, Antithrombotic, Lymphedema.