ISSN 0778-5569

OFFICIAL ORGAN
OF THE

EUROPEAN GROUP
OF LYMPHOLOGY
LATIN-MEDITERRANEAN
CHAPTER OF ISL
SOCIETÀ ITALIANA
DI LINFANGIOLOGIA

THE EUROPEAN JOURNAL OF lymphology

and related problems

VOLUME 15 • No. 44 • 2005

INDEXED IN EXCERPTA MEDICA

SUMMARY

Clinical Sciences

XXXI g.e.l Congress - Rome, 11-12 June 2005

Calendar

THE EUROPEAN JOURNAL
OF
lymphology
and related problems
VOLUME 15 • No. 44 • 2005
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SMOM
Associazione dei
Cavalieri Italiani

g.e.l
groupement européen de
lymphologie

European Group of Lymphology

XXXI CONGRESS

Rome, 11-12 June 2005

Congress Venue:

San Giovanni Battista Hospital - A.C.I.S.M.O.M.
Rome - Via L.E. Morselli, 13

Honorary Presidents: Prof. Mauro Bartolo, Prof. Corradino Campisi
President: Dr. Sandro Michelini
Vice President: Prof. Francesco Boccardo

Honorary Committee

S. E. Jean Pierre Mazarine – *Gran Cancelliere S.M.O.M.*
Fausto Solaro Del Borgo – *Presidente ACISMOM*
Marcello Sacchetti – *Ospedaliere ACISMOM*
Enzo Colaiacomo – *Direttore Generale delle Attività Sanitarie ACISMOM*
Azeglio Manzetti De Fort – *Cappellano Capo ACISMOM*
Adriano Micci – *Direttore Sanitario Ospedale San Giovanni Battista*

Programme

Auditorium

Saturday 11 June

H. 7.00 - 8.00 Registration
H. 8.00 Opening Cerimony

Session I

Genetic, Anatomy and Physiology of Lymphatic System

Presidents Azzali Giacomo *(Italy)*, Eliska Oldrich *(Czech Rep.)*, Bartolo Mauro *(Italy)*
Chairman Alitalo Kari *(Finland)*, Fulcheri Ezio *(Italy)*, Witte Marlys *(USA)*

H. 8.30 *Lecture:* **Transendothelial migration and diffusion of melanoma and adenocarcinoma cancer cells in the absorbent lymphatic vessel**

Azzali Giacomo
Laboratory of Lymphology, Section of Human Anatomy, University of Parma, Italy

H. 8.50 **Molecular pathways for lymphangiogenesis and their role in human diseases**

Steven A. Stacker[1], Carol Caesar[1], Rachael Inder[1], Megan Baldwin[1], Brad McColl[1], Sally Roufail[1], Richard Williams[2], Tony Hughes[3], Kari Alitalo[4], Marc G. Achen[1]
[1] *Angiogenesis Laboratory, Ludwig Institute for Cancer Research, PO Box 2008, Royal Melbourne Hospital, 30050, Victoria, Australia*
[2] *Department of Pathology, Faculty of Medicine, Dentistry and Health Sciences, University of Melbourne, Victoria, Australia*
[3] *Department of Pharmacology, University of Melbourne*
[4] *Molecular/Cancer Biology Laboratory, Haartman Institute, University of Helsinki, Finland*

H. 9.05 **Lymphangiogenesis in development and diseases**

Alitalo Kari
Research Professor of Finnic Academy of Sciences, Mulecolar/Biology Laboratory Biomedicum Helsinki, University of Helsinki, Finland

H. 9.20 **Gene, receptors and lymphangio-tumorigenesis**

Witte Marlys, K. Jones, M. Bernas, C.L. Witte
College of Medicine, University of Arizona, Tucson, U.S.A.

H. 9.35 **Lymphangiogenesis and lymphatic invasion of gastric adenocarcinoma studied by D2-40 immunohistochemistry**

Okada Eikichi
Takaoka City Hospital, Department of Pathology, Takaoka, Toyama, Japan

H. 9.50 **Growth factors and their receptors during embryonic development in experimental tumors**

Jörg Wilting, Mara Papoutsi, Kerstin Buttler, Alice Kreysing, Lothar Schweigerer
Children's Hospital, Pediatrics I, University of Goettingen, Robert-Koch-Strasse 40, 37075 Göttingen, Germany

H. 10.10 **Lymphonodal lymphatic circulation between normal and pathological patterns**

E. Fulcheri, S. Valdevit
Institute of Pathological Anatomy, S. Martino Hospital, University of Genoa, Italy

H. 10.25 *Coffee Break*

H. 10.40 **Role of Extracellular Matrix in Elastic Compression During Limb Lymphoedema**

F.G. Albergati[1], P.A. Bacci[2], M. Farina[3], F. Mariani[4], S. Michelini[5], E. Minelli[6], C. Campisi[7]
[1] *Chief, Center of Microcirculation, Policlinico di Monza, University of Milan, University of Pavia; Monza, Italy*
[2] *University of Siena, President, Italian Academy of Beauty*
[3] *Director, Center of Veno-Lymphatic Disease, Policlinico di Monza, University of Milan, Monza, Italy*
[4] *University of Siena, Italy*
[5] *San Giovanni Battista Hospital, Rome, Italy*
[6] *University of Milan, Scientific Coordinator of WHO*
[7] *San Martino Hospital, University of Genoa, Italy*

H. 10.55 **Innate reaction of human skin to infection involves keratinocytes, dendritic cells, tissue fluid and lymphatic system**

Olszewski W.L, Cakala M., Stanislawska J., Zaleska M., Galkowska H.
Department of Surgical Research & Transplantology, Medical Research Center, Pol. Acad. of Sci., Warsaw, Poland

H. 11.10 **Does lymphatic drainage exists from the arterial wall of normal and arteriosclerotic changed coronary arteries? Morphology comparisons with internal thoracic and radial artery and primary lymphedema**

Oldrich Eliska[1], Miloslava Eliskova[1], Albert J. Miller[2]
[1] Department of Anatomy 1st Medical Faculty, Prague, Czech Republic
[2] Northwestern University Medical School, Chicago, Ill., USA

H. 11.25 *Discussion*

Auditorium
Saturday 11 June

Session II
Primary and Secondary Prevention of Lymphedema

Presidents Bourgeois Pierre *(Belgium)*, Cascinelli Natale *(Italy)*, Campisi Corradino *(Italy)*
Chairman Pissas Alexandre *(France)*, Benda Karel *(Czech Rep.)*, Musumeci Renato *(Italy)*

H. 11.40 *Lecture:* **Prevention of lymphedema requires knowledge of macroscopic anatomy**

Pissas Alexandre
Unit of treatment of oedema, General Hospital Louis Pasteur, 30200 Bagnols sur Cèze, France

H. 12.00 **Modern strategies of oncological surgery**

Cascinelli Natale
Scientific director of the National Cancer Institute, Milan, Italy

H. 12.10 **The lymphedema prevention in major orthopaedic surgery**

G.C. Sironi, G. Di Luca, D. Corti
Istituto Ortopedico Gaetano Pini, Università degli Studi di Milano, U.O.C. Chirurgia Vascolare

H. 12.20 **Role of the radiotherapeutic protocol in primary prevention of secondary lymphedema**

Lucà Francesco
Department of Radiotherapy, San Camillo-Forlanini Hospital, Rome, Italy

H. 12.30 **Risk factors in lymphedema – How to combat them in favour of lymphedema prevention (review)**

K. Benda, M. Bendová
Institute of Radiology and Department of Clinical Psychology, University Hospital Brno, Czech Republic

H. 12.40 **A new protocol of prevention of secondary lymphedema**

F. Boccardo[1], E. Fulcheri[1], G. Taddei[1], G. Villa[1], S. Michelini[2], C. Campisi[1]
[1] Department of Surgery, Lymphologic Surgery and Microsurgery Unit, S. Martino Hospital, University of Genoa, Italy
[2] San Giovanni Battista Hospital, Rome, Italy

H. 12.50 **Lymphology in Emergency Room**

A. Macciò[1], V. La Ganga[1], B. Palenzona[1], A. Arata[1], R. Lo Giudice[1], C. Campisi[2]
[1] *Presidio Ospedaliero Ovada ASL 22 Piemonte*
[2] *Department of Surgery, Section of Lymphatic Surgery and Microsurgery, S.Martino Hospital, University of Genoa, Italy*

H. 13.00 **Schematic views of different pathophysiological situations which cause Lymphedema**

Thibaut Gilbert
Department of Medicine Interne, University of Nancy, France

H. 13.10 *Discussion*

H. 13.30 *Lunch*

Auditorium
Saturday 11 June

Session III
Clinical Lymphology

Presidents Garovich Vesna *(USA)*, Bartoletti Carlo Alberto *(Italy)*, Del Guercio Raffaele *(Italy)*
Chairman Földi Ethel *(Germany)*, Todini Anna Rita *(Italy)*, Campisi Corradino *(Italy)*

H. 14.30 *Lecture:* **Clinical aspects of Lymphedema**

Földi Ethel
Member of Executive Committee of International Society of Lymphology, Foeldiklinik Hinterzarten, Germany

H. 14.50 **CEAP-L: proposal of a new classification of lymphedema**

Gasbarro Vincenzo
Department of Surgery, University of Ferrara, Italy

H. 15.00 **Lymphedema phlebedema and phlebolymphedema. Clinical and physiopatological aspects: proposal of classification**

Todini Anna Rita, Ricci Giuseppe
Department of Angiology, San Camillo Hospital, Rome, Italy

H. 15.10 **Depending lymphedema**

Marchitelli Elsa
Department of Angiology, S. Eugenio Hospital, Rome, Italy

H. 15.20 **The individual rehabilitation plan of the subject affected by lymphedema**

Basaglia Nino
Department of Rehabilitation, S. Giorgio Hospital, Ferrara, Italy

H. 15.30 **Chronic lymphedema and adipocyte proliferation: Clinical therapeutic implications**

Håkan Brorson MD, PhD, Karin Ohlin OTR, Gaby Olsson PT, Barbro Svensson PT
The Lymphedema Unit, Department of Plastic and Reconstructive Surgery, Malmö University Hospital, SE-205 02 Malmö, Sweden

H. 15.40 **Morbid obesity and lymphatic microangiopathy**

R. Del Guercio, L. Del Guercio, G. Ragozzino
Chair of Angiology, University Federico II, Naples

H. 15.50 *Discussion*

H. 16.00 *Coffe Breack*

Auditorium
Saturday 11 June

Session IV
Imaging in Lymphology

Presidents Allegra Claudio *(Italy)*, Benda Karel *(Czech Rep.)*
Chairman Leduc Olivier *(Belgium)*, Marchitelli Elsa *(Italy)*, Boccardo Francesco *(Italy)*

H. 16.15 *Lecture:* **New Techniques of Investigation in Lymphology**

Allegra Claudio
Present President of International Union of Phlebology, San Giovanni Hospital, Rome, Italy

H. 16.35 **Lymphoscintigraphy helps to classify edema of various etiology and to establish appropriate therapy**

Olszewski Waldemar
Department of Surgical Research & Transplantology, Medical Research Center, Pol. Acad. of Sci., Warsaw, Poland

H. 16.45 **Ultrasonic, magnetic resonance, spectroscopic and histological studies of cutaneous biopsies of patients affected with chronic lymphedema**

O. Leduc[1], E. Fumière[2], S. Fourcade[1], C. Becker[3], C. Garbar[4], F. Wilputte[5], A. Leduc[1], E. Delcour[2]
[1] Environmental Physiology Laboratory, Lympho-flebology Unit., Haute Ecole PH. Spaak, Bruxelles
[2] Radiology Dept., Centre Hospitalier Universitaire, Charleroi, ULB
[3] Hôpital Européen Georges Pompidou, Paris, France
[4] Anatomopathology, Centre Hospitalier Universitaire, Charleroi, ULB
[5] CUB Erasme, Physiotherapy dept., Bruxelles, Belgique

H. 16.55 **Lymphedema: Computering Tomography and therapeutical implications**

G.L. Paroni Sterbini, S. Michelini, A. Failla, G. Moneta, L. Mariani
San Giovanni Battista Hospital, ACISMOM, Rome, Italy

H. 17.05 **US and MR imaging of edema in relation with histological findings**

Tassenoy A., Vermeiren K., Stadnik T., Lamote J, Lievens P.
Vrije Universiteit Brussel, Dep. of Rehabilitation Research, Laarbeeklaan 103, 1090 Brussels, Belgium

H. 17.15 **Lymphatic system imaging by means of ultrasound and magnetic resonance**

O. Leduc[1], E. Fumière[2], L. Brognard[1], F. Wilputte[3], A. Stenhouse[1], A. Leduc[1], C. Delcour[2]
[1] Haute Ecole PH Spaak, Lympho-flebology Unit, Brussels
[2] Department of Radiology, CHU Charleroi, Université Libre de Bruxelles
[3] CUB Erasme, Brussels

H. 17.25 **Differential diagnosis between lymphangitis and no-bacterial dermo-hypodermitis**

Ricci Giuseppe, Todini Anna Rita
Department of Angiology, San Camillo Hospital, Rome, Italy

H. 17.35 **Regulation's Pharmaco therapy: a new hypothesis for understanding of the working of the Extra-cellular Structures in Phlebo-Limphology?**

Stellacci Alessandro
President of "Italian Group for Study of Regulation Pharmaco therapy"

H. 17.45 *Discussion*

Auditorium
Saturday 11 June

H. 18.00 *General Assembly of g.e.l*

H. 20.30 *Gala Dinner*

Auditorium
Sunday 12 June

Session V
Nuclear Medicine and Lymphatic System

Presidents Bourgeois Pierre *(Belgium)*
Chairman Pecking Alain *(France)*, Mango Lucio *(Italy)*

H. 8.00 *Lecture:* **Lymphoscintigraphic investigations and clinic of the edematous limb**

Bourgeois Pierre
Service of Nuclear Medicine, Institute Jules Bordet, Université Libre de Bruxelles, Brussels, Belgium

H. 8.20 **Sentinel lymphnode in the treatment of breast cancer**

Pecking Alain
Director of the Nuclear Medicine department Centre René Huguenin, Saint-Cloud, France
Associate director of the René Huguenin anticancer center

H. 8.30 **Sentinel Node Staging of Resectable Colon Cancer: Results of a single centre of general surgery**

G. Pasquini, V. Bruni, PM. Amodio, P. Bonatti, L. Martinengo, G. Santi.
U.O. Chirurgia Generale Ospedale Belcolle, Viterbo

H. 8.40 **Radioisotopic identification of sentinel lymphnode and prevention of lymphedema secondary to surgical treatments**

Villa Giuseppe
U.O. Medicina Nucleare, Az. Università-Ospedale San Martino di Genova, Italy

H. 8.50 **Lymphoscintigraphy and clinic**

Mango L.[2], Michelini S.[1], Failla A.[1], Moneta G.[1]
[1] *San Giovanni Battista Hospital, Rome, Italy*
[2] *Nuclear Medicine Department, Azienda Ospedaliera San Camillo-Forlanini, Rome, Italy*

H. 9.00 **Parasternal (PS) Sentinel Node (SN) Biospy in Breast Cancer (BC)?**

Bourgeois P.[1], Adamski S.[2], Nogaret J.M.[2], Veys I.[2], Noterman D.[2], Schobbens J.L.[2], Hertens D.[2], Dagnelie J.[3], Van Audenaerde[3], Allaer D.[2], Moerman K.[3], Larsimont D.[4]
Service of Nuclear Medicine[1], Service of Radiology[2], Dept. of Surgery[3], Service of Anatomo-Pathology[4], Institut Jules Bordet, Université Libre de Bruxelles, Brussels, Belgium

H. 9.10 *Discussion*

Auditorium
Sunday 12 June

Session VI
Surgical Treatment of Lymphatic Diseases

Presidents Campisi Corradino *(Italy)*, Baumeister Rudiger *(Germany)*, Papendieck Cristobal *(Argentina)*
Chairman Olszewski Waldemar *(Poland)*, Mancini Sergio *(Italy)*,Brorson Hakan *(Sweden)*

H. 9.30 *Lecture:* **Techniques and Long Term Outcome of Lymphatic Microsurgical Operations**

Campisi Corradino, A.Zilli, E. Da Rin, C.Eretta, F.Boccardo
Department of Surgery, Section of Lymphatic Surgery and Microsurgery, S. Martino Hospital, University of Genoa, Italy

H. 9.50 **Microsurgical lymphovenous shunts after 40 years - Indications, techniques and follow-up evaluation methods**

Olszewski Waldemar
Department of Surgical Research & Transplantology, Medical Research Center, Pol. Acad. of Sci., Warsaw, Poland

H. 10.00 **Clinical and therapeutical strategies in Lymphatic diseases management in pediatrics**

Papendieck Cristobal
IADT - ISNA, Universidad del Salvador, Buenos Aires, Argentina

H. 10.10 **The theory and practice of plastic surgery treatment for lymphedema patients**

Håkan Brorson MD, PhD, Karin Ohlin OTR, Gaby Olsson PT, Barbro, Svensson PT
The Lymphedema Unit, Department of Plastic and Reconstructive Surgery, Malmö University, Malmö, Sweden

H. 10.20 **The follow-up of patients after resconstructive lymphatic microsurgery by lymphoscintographic measurement**

Rüdiger G.H. Baumeister,[1] M. Weiss,[2] A. Frick[1]
[1] *Division of Plastic-, Hand-, Micro-surgery, Lymphology, Department of Surgery, Großhadern*
[2] *Department of Nuclear Medicine, University of Munich*

H. 10.30 **Surgical procedures in very advanced lymphedema of lower limbs**

Olszewski Waldemar
Department of Surgical Research & Transplantology, Medical Research Center, Pol. Acad. of Sci., Warsaw, Poland

H. 10.40 **Superficial venous dysplasias of the lower limbs and relation with lymphatic dysplasias**

Raul Mattassi, Franca Abbritti, Roberto Dentici
Centre of the Study of Angiodisplasis, Garbagnate Milanese, Italy

H. 10.50 **Liposuction in upper limb lymphoedema**

Matthew Hough
Department of Plastic Surgery, Ninewells Hospital, Dundee, United Kingdom

H. 11.00 *Discussion*

Aula Magna
Sunday 12 June

H. 9.15 **Workshop**

New acknowledgements on Elastocompressure

(Sponsored by B.S.N.)

Invited Speakers

Kathrine Young	**Elastocompressure and C.P.T.**
Domenico Corda	**Oedematous upper limb**
Alessandro Failla	**Oedematous lower limb**
Angela Vollmer	**Tailored garment**

H. 11.15 *Coffe Break*

Auditorium
Sunday 12 June

Session VII
Medical and Physical Management of Lymphedema

Presidents Foldi Michael *(Germany)*, Leduc Albert *(Belgium)*
Chairman Michelini Sandro *(Italy)*, Cluzan Robert *(France)*, Partsch Hugo *(Austria)*

H. 11.30 *Lecture:* **Physical treatment of oedema: progress and perspectives**

Leduc Albert
Member of Executive Committee of European Group of Lymphology, Brussels, Belgium

H. 11.50 **Guidelines in comparison in the management of patient with mastectomy**

Santilli Valter
Chair of Physical and Rehabilitative Medicine, University "La Sapienza", Rome, Italy

H. 12.00 **A.N.D.O.S. (National Association of Breast Operated Women) and the operated women's problems**
Degrassi Flori
National Coordinator of "Associazione Nazionale Donne Operate al Seno"

H. 12.10 **Lymphatic drainage by means sound waves**
Ricci Maurizio
Chief of Rehabilitation operative unit, Hospital of Ancona, Italy

H. 12.20 **Rehabilitative plain in out-patients**
Corda Domenico
Rehabilitative Centre of Casteggio, Pavia, Italy

H. 12.30 **Complex Decongestive Physical Therapy (C.D.P.T.): role of manual lymphatic drainage**
Bartoletti Roberto, Bartoletti Carlo Alberto
S. Giovanni Calamita (Fatebenefratelli) Hospital, Rome, Italy

H. 12.40 **Monitoring of the edematous limb**
Dr. Antonio Molisso
Rehabilitative Serapide Centres, Naples, Italy

H. 12.50 *Discussion*

H. 13.00 *Lunch*

Aula Magna
Sunday 12 June

Session VIII
Posters

Presidents **Benda Karel *(Czech Rep.)*, Rada Oiol *(Romania)*, Moneta Giovanni *(Italy)***

H. 13.45 - 14.30

Fibrosis as a result of lymphatic drainage impairment and its affection by proteases
Wald Martin, Houdová Hana
Department of Clinical Surgery, University of Prague, Czech Republic

Nursing in lymphedema patients
Giardini Marco, Fraleoni Alex, Failla Alessandro, Moneta Giovanni, Michelini Sandro
San Giovanni Battista Hospital, Rome, Italy

Optional Circulatory and Compelling Circulatory Lymph Load
F.C. Rada, S. Blaj, T. Mihoc, I.O. Rada
Timisoara Medical and Pharmaceutical University, Romanian Society of Lymphology, Romania

The education and information of patients through the experience of the Lymphology Group of A.S.L. 4 Terni

M. Castelletti, F. Appetecchi, L. Curti, C. De Rebotti, L. Nobilia, D. Torriglia, M. Cestari, M. Carotti
U.O. Riabilitazione territoriale "Domus Gratiae", A.S.L. 4, Terni, Italy

The complex decongestive therapy of elephantiasis (case report)

Navratilova Zuzana
Dermatovenereology, St. Ann's Faculty Hospital, Brno, Czech Republic

Immunohistopathology of human leg skin and lymphatics in lymphedema

Waldemar Lech Olszewski, Marzanna Zaleska, Marta Cakala, Dorota Zolich
Department of Surgical Research & Transplantology, Medical Research Center, Polish Academy of Sciences, Warsaw, Poland

"Combined self-management" within self-care in lymphedema patient

L. Curti, F. Appetecchi, M. Castelletti, C. De Rebotti, L. Nobilia, D. Torriglia, M. Cestari, M. Carotti
U.O. Riabilitazione territoriale "Domus Gratiae", A.S.L. 4, Terni, Italy

How to avoid lymphedema after flebectomy?

Alonzo Ugo
Venous Day Surgery, S. Filippo Neri Hospital, Rome, Italy

Changes of body image in patients with vascular diseases: psychological aspects

Rossini Fausto, Merlino Anna, Karuc Aurora, Michelini Sandro
Vaclav Vojta Centre, Rome, Italy

The role of the pressotherapy in the combined physical treatment of lymphedema

Ricci Giuseppe, Todini Anna Rita
Department of Angiology, S. Camillo Hospital, Rome, Italy

Gorham-Stout Syndrome: a rare case report

Michelini S., Failla A., Moneta G.
S. Giovanni Battista Hospital, Rome, Italy

Auditorium
Sunday 12 June

Session IX
Rehabilitative Treatment of Lymphedema

Presidents Földi Michael *(Germany)*, Parstch Hugo *(Austria)*
Chairman Papendieck Cristobal *(Argentina)*, Thibaut Gilbert *(France)*, Belgrado Jean Paul *(Belgium)*

H. 14.15 *Lecture:* **Compression therapy on Lymphedema**

Partsch Hugo
Past President of International Union of Phlebology, Wien, Austria

H. 14.35 **Haemodinamics effects of multilayerd bandages dressed on a lower limb of patients**

F. Wilputte[1], M. Renard[2], J. Ph. Venner[1], O. Leduc[2], J. Strapart[1]
ULB Erasme Hospital, Brussels, Belgium:
[1] Department of Vascular Disease, [2] Coronary Unit, P.H. Spaak College Phlebo-lymphology Unit, Brussels, Belgium

H. 14.45 **Olistic approach to the patient suffering from lymphedema**
Michelini Sandro, Failla Alessandro, Moneta Giovanni
San Giovanni Battista Hospital, Rome, Italy

H. 14.55 **Responses to treatment of postsurgical lymphedema: effects of delays in recognition and body mass index**
Iker Emily
Lymphedema Treatment Center, Santa Monica, CA, USA

H. 15.05 **Tailored rehabilitive protocol in lymphedema patient**
Michelini Sandro, Failla Alessandro, Moneta Giovanni, Macaluso Bartolomeo
San Giovanni Battista Hospital, Rome, Italy

H. 15.15 **Variation of the skin's temperature under the multi-layer bandages during 24 H**
Belgrado J.P., Baudier C., Moraine J.J.
Université Libre de Bruxelles, ISEPK, Brussels, Belgium

H. 15.25 *Discussion*

Auditorium
Sunday 12 June

Session X
Modern Strategies in the Management of Lymphedema

Presidents Nuno Grande *(Portugal)*, Ohkuma Morija *(Japan)*, Pissas Alexandre *(France)*
Chairman Leduc Albert *(Belgium)*, Cluzan Robert *(France)*, Failla Alessandro *(Italy)*

H. 15.40 *Lecture:* **Lymphedema-related acute dermatitis and its pathophysiology and clinical management**
Ohkuma Morija
Department of Dermatology, Kinki University, Sakai, Japan - President of International Society of Lymphology

H. 16.00 **Management of lymphedema: echocolordoppler indications for the strategies**
Cestari Marina
Operative Unit of Territorial Rehabilitation, Angiology outpatients' surgery-lymphology laboratory, A.S.L. 4, Terni, Italy

H. 16.10 **Role of high resolution ultrasonographic imaging and MRI studies in patients with secondary lymphedema of the arm**
Mander Antonio, Burrai L.
Vascular Rehabilitative Centre CAR, Rome, Italy

H. 16.20 **The effect of oriental drugs on lymphedema treatment**
Ohkuma Morija
Dept. of Dermatology, Kinki University, Sakai, Japan
President of International Society of Lymphology

H. 16.30 **Management of Lymphatic Dysplasias in Newborns**

Carlo Bellini, Francesco Boccardo[1], Giovanni Serra, Corradino Campisi[1]
Neonatal Intensive Care Unit, Pediatric Department, University of Genoa, Gaslini Institute, Genoa, Italy
[1] Microsurgery, Department of Surgical Science, Anesthesiology and Organ Transplantation, University of Genoa, Genoa, Italy

H. 16.40 **Management of peripheral lymphedema**

Cluzan Robert
Present Secretary of International Society of Lymphology, Emarainville, France

H. 16.50 **The most important time is the first consultation**

Pissas Alexandre, F. Dautheville, C. Parayre, N. Desmaret
Unit of Treatment of Oedema, General Hospital Louis Pasteur, 30200 Bagnols sur Ceze, France

H. 17.00 **Indications and controindications to the physical treatment**

Michelini S., Moneta G., Failla A., Manfroni S., Calisse P., Paradiso M.
San Giovanni Battista Hospital, ACISMOM, Rome, Italy

H. 17.10 **Monitoring of oedematous limb**

Molisso Antonio
Centres Fisioterapici Serapide, Naples, Italy

H. 17.20 **Tailored garments for lymphedema in particular clinical cases**

Vollmer Angela
Orthopedic Technician, Tivolistrasse 11, Freiburg, Germany

H. 17.30 **Hydrokinesi therapy as a useful support to the treatment of primary and secondary lymphedema of lower and upper limbs**

Piccione Sara, Aniello Cristina, Calabrese Sergio, Mangiarotti Marco, Risina B.U., Michelini Sandro
Vaclav Vojta Centre, Rome, Italy

H. 17.40 *Discussion*

H. 17.50 *Final wishes*

ABSTRACTS OF THE SCIENTIFIC SESSION

THE EUROPEAN JOURNAL OF lymphology and related problems
VOLUME 15 • No. 44 • 2005
INDEXED IN EXCERPTA MEDICA

Session I: Genetic, Anatomy and Physiology of Lymphatic System

S I - 1

TRANSENDOTHELIAL MIGRATION AND DIFFUSION OF MELANOMA AND ADENOCARCINOMA CANCER CELLS IN THE ABSORBENT LYMPHATIC VESSEL

GIACOMO AZZALI – EMERITUS PROFESSOR
Director of the Laboratory of Lymphatology, Section of Human Antomy, University of Parma, Italy

The organization and the fine structure of lymphatic vascular system canalization, and especially the lymphatic microcirculation where endothelium shows high absorption capacity, are examined. With regard to their morphofunctional features, these vessels are identified as belonging to the Apparatus Lymphaticus Periphericus Absorbens (ALPA), which plays a basic role in the regulation of the interstitial fluid homeostasis, in the immune response and in the transendothelial migration process of macromolecules, normal cells and tumour cells. In particular, the presence and the distribution of the ALPA lymphatic vessels in tumour primary sites and in metastases of VEGF-C-overexpressing experimental tumours (TRAMP and T84 adenocarcinoma, and B16 melanoma) are studied. Furthermore, in the extravascular interstitial matrix, mechanisms of spatial diffusion of absorbing lymphatic vessel-directed tumour cells are evaluated. The phases of lymphocytes and tumor cells transendothelial transport into the ALPA lymphatic vessel are also studied by transmission electron microscopy and three-dimensional models, with particular regard to the role of the intraendothelial channels. The latter are morphological dynamic structures, which are formed owing to the peculiar plasticity of the lymphatic endothelial cell. Finally, molecular bases that can actively interfere with the transendothelial migration process are discussed, as well as prospects for future therapeutic strategies to facilitate the diffusion of interstitial fluid (lymphedema) and immune cells (lymphocyte recirculation), and for blocking the spread of tumour cells (metastasis) are suggested.

S I - 2

MOLECULAR PATHWAYS FOR LYMPHANGIOGENESIS AND THEIR ROLE IN HUMAN DISEASE

STEVEN A. STACKER[1], CAROL CAESAR[1], RACHAEL INDER[1], MEGAN BALDWIN[1], BRAD McCOLL[1], SALLY ROUFAIL[1], RICHARD WILLIAMS[2], TONY HUGHES[3], KARI ALITALO[4] & MARC G. ACHEN[1]
[1] *Angiogenesis Laboratory, Ludwig Institute for Cancer Research, PO Box 2008, Royal Melbourne Hospital, 3050, Victoria, AUSTRALIA.*
[2] *Department of Pathology, Faculty of Medicine, Dentistry and Health Sciences, University of Melbourne, Victoria, Australia.*
[3] *Department of Pharmacology, University of Melbourne.*
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The dysfunction or proliferation of lymphatic vessels (lymphangiogenesis) is linked to a number of pathological conditions including lymphedema and cancer (1, 2). The recent discovery and characterisation of the lymphangiogenic growth factors vascular endothelial growth factor-C (VEGF-C) and VEGF-D and of their receptor on lymphatic endothelial cells, VEGFR-3, has provided an understanding of the molecular mechanisms controlling the growth of lymphatic vessels. In addition, other genes and protein markers have been identified with specificity for lymphatic endothelium that have enhanced the characterization and isolation of lymphatic endothelial cells. Our growing understanding of the molecules that control lymphangiogenesis allows us to design more specific drugs with which to manipulate the relevant signalling pathways (3). Modulating these pathways and other molecules with specificity to the lymphatic system could offer alternative treatments for a number of important clinical conditions.

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S I - 3

LYMPHANGIOGENESIS IN DEVELOPMENT AND DISEASES

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Angiogenesis and permeability of blood vessels are regulated by vascular endothelial growth factor (VEGF) via its two receptors VEGFR-1 and VEGFR-2. The VEGFR-3 receptor does not bind VEGF and its expression becomes restricted mainly to lymphatic endothelia during development. We have found that homozygous VEGFR-3 targeted mice die around midgestation due to failure of cardiovascular development. We have also purified and cloned the VEGFR-3 ligand, VEGF-C. Transgenic mice expressing VEGF-C show evidence of lymphangiogenesis and VEGF-C knockout mice have defective lymphatic vessels. The proteolytically processed form of VEGF-C binds also to VEGFR-2 and is angiogenic. VEGF-D is closely related to VEGF-C, similarly processed and binds to the same receptors. Thus VEGF-C and VEGF-D appear to be both angiogenic and lymphangiogenic growth factors. VEGF-C overexpression led to lymphangiogenesis and growth of the draining lymphatic vessels, intralymphatic tumor growth and lymph node metastasis in several tumor models. Furthermore, soluble VEGFR-3, which blocked embryonic lymphangiogenesis, also blocked lymphatic metastasis in breast and lung cancer models. These results together with recent clinical cancer studies suggest that paracrine signal transduction between tumor cells and the lymphatic endothelium may be involved in lymphatic metastasis of human cancers.

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S I - 4

GENES, RECEPTORS, LYMPHANGIOTUMORIGENESIS AND TUMOR LYMPHANGIOGENESIS

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Recent advances in molecular biology have ushered in the era of "molecular lymphology." These discoveries, new concepts and techniques, viewed in the context of pioneering landmarks spanning the history and spectrum of lymphology, are opening the window on the poorly understood development, structure and function of this "system" of lymphatic vessels, lymph nodes, and lymph circulation in health and disease. Intimately associated with tissue and cellular events, the implicated molecular inventory of growth factor ligands (particularly VEGF and angiopoietin families), endothelial receptors, transcription factors, and genes appear to modulate, by as yet unclear and unrelated pathways, both "lymphvasculogenesis and lymphangiogenesis" (including also "tumor lymphangiogenesis" and "lymphangiotumorigenesis"). These processes are similar to yet also distinctively different from those involving the blood vasculature (more properly termed "hemovasculogenesis and hemangiogenesis"); they may also merge and manifest as disordered pathobiology and disease as "system" components become dysregulated or autonomous. In combination with fresh insights and refined tools in "clinical lymphology" and clinical genetics, including non-invasive lymphatic system imaging (for phenotyping) and human genomic analysis, unparalleled opportunities are arising in "translational lymphology" for screening, monitoring, staging, and more rationally classifying lymphatic disease and lymphatic involvement in multisystem diseases including cancer and the ~40 familial dysmorphic lymphedema-angiodysplasia syndromes. In addition, new therapeutic approaches including individualized designer drugs and gene therapy as well as stem cells and tissue engineering hold promise as well as challenges to modulate lymphatic growth and functions so as to prevent or minimize disease and restore health.

S I - 5

LYMPHANGIOGENESIS AND LYMPHATIC INVASION OF GASTRIC ADENOCARCINOMA STUDIED BY D2-40 IMMUNOHISTOCHEMISTRY

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Materials and methods. Ten cases of surgically resected stomachs with primary gastric adenocarcinoma and their regional lymph nodes were the materials in this study. Histological sections from them were stained by immunohistochemistry using monoclonal antibody D2-40 (DakoCytomation M3619) to study distribution of lymphatic vessels and lymphatic invasion by tumor cells.

Results. By D2-40 immunohistochemistry, lymphatic endothelial cells revealed clear positive signals and endothelial cells of the blood vessels revealed no signals. In cancer-free areas, D2-40-positive lymphatic vessels distributed in the levels fr om deeper layers of lamina propria mucosae to subserosa continuously. In the stroma of cancer tissue, small calibered D2-40 positive lymphatic vessels were observed. Lymphatic vessel invasion by tumor cells were principally observed in pre-existent submucosal lymphatic vessels. There was no lymphatic invasion in lymphatic vessels in the stroma of the cancer tissue. The extent of lymphatic invasion correlated positively with that of lymph node metastasis.

Conclusion. D2-40 immunohistochemistry was useful to distinguish lymphatic vessels from blood vessels in histological sections under a light microscope. Although lymphangiogenesis takes place in the stroma of gastric adenocarcinoma, lymphatic vessel invasion by cancer cells occurs exclusively in pre-existent lymphatics.

S I - 6

EMBRYONIC DEVELOPMENT OF THE LYMPHATIC SYSTEM AND TUMOR LYMPHANGIOGENESIS

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The embryonic origin of lymphatic endothelial cells (LECs) from either the venous system or mesenchymal lymphangioblasts presents as a long lasting controversy. According to the "centrifugal theory" (Sabin 1902), lymphatics develop as sprouts from early embryonic lymph sacs and grow toward the periphery and into the inner organs. Since the lymph sacs are derived from specialized parts of the venous system, all LECs are derived from venous endothelium. In contrast, others propagated the development of LECs from mesenchymal cells in a "centripetal" direction (Huntington and McClure 1908, Kampmeier 1912), and connections between the central veins and the lymphatics are formed later. Highly specific markers of the LECs have now been found enabling us to reinvestigate their embryonic origin. The homeobox transcription factor Prox1 is expressed in lymphatic but not in blood vascular endothelial cells throughout murine and avian development. We show expression of scattered Prox1-positive cells in the dermatome of 4-day-old chick embryos by in situ hybridization and immunostaining. These cells form the lymphatic networks in the skin of the body wall and the limbs during further development. This strongly suggests that superficial lymphatics of avian embryos develop independently from the deep ones, and are derived from mesenchymal lymphangioblasts. Our recent immunohistological studies on murine embryos also point out to the existence of lymphangioblast in various mesenchymal compartments. Growth factors, like Vascular Endothelial Growth Factor (VEGF)-C and VEGF-D, which are active during embryonic lymphangiogenesis, are also of major importance during adult lymphangiogenesis. We have studied their effects on the chorioallantoic membrane (CAM) of avian embryos either by applying pure protein or by inoculation of tumor cells expressing VEGF-C or –D. Whereas the cognate growth factor VEGF-A induces hemangiogenesis, but not lymphangiogenesis, VEGF-C and –D induce proliferation of LECs and lymphangiogenesis, and also a weak hemangiogenic reaction. Tumor cells grown on the CAM become vascularized by host vessels. Human A375 melanoma cells and rat 10AS pancreatic carcinoma cells, which express high amounts of VEGF-C and -D, become penetrated by blood vessels and lymphatics. Lymphangiogenesis is dramatically reduced when the A375 melanoma cells are stably transfected with cDNA encoding the soluble form of VEGFR-3, whereas the soluble form of VEGFR-2 inhibits hemangiogenesis. None of the transfections seems to decrease the invasive potencies of the tumor cells.

SI - 7

LYMPHONODAL LYMPHATIC CIRCULATION BETWEEN NORMAL AND PATHOLOGICAL PATTERNS

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The Authors report their long experience concerning the isto-pathological and immuno-istochemical alterations found in lymphatic and lymph nodal structures in peripheral lymphedemas at different stages, and try to correlate these alterations with the severity of the lymphostatic pathology. Moreover, an original study of interstitial matrix drawn from the same lymphedematous limbs has opened new horizons in understanding the real pathophysiological mechanisms that influence the evolution and progression of chronic tissular alterations in lymphedemas.
Finally, there seems to be a correlation between specific structural alterations of lymph nodes and lymphatic collectors with the possible appearance of secondary lymphedema, thus playing an important role in the prevention of the disease.

SI - 8

ROLE OF EXTRACELLULAR MATRIX IN ELASTIC COMPRESSION DURING LIMB LYMPHOEDEMA

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Under a vascular view point, elastic compression is, still as far today, one among the most common therapeutic tools used by clinician during chroniv venous insufficiency because simple to use, poor for risks and rich of satisfaction for patient. It is believed about 50% of CVI patients are addressed to elastic compression, and since another 25-30% shoul be also treated with it, we can rapidly realize the magnitude of therapeutic utility of elastic compression. There are several interpretative mechanisms to explain the action of elastic compression in clinical practice, and the most accepted seeems to be the "re-balance" of many pressure disorders across the vessel.
By acting together on the increase of volume of interstitial comparts both with elastic compression and adequate theraphies, we can get very important results under the clinic view point. When considering that venous and lymphatic compartments cooperate to substain and maintain phisiologic conditions of microcirculatory pattern of tissue unit, we can understand that both structures are normally involved during CVI and lymphoedema. Under a physiopathologic aspect, in addition to these synthetic considerations we also have to take into account the extracellular structures involved in this chronic process, since lots of clinical and speculative evidences put in evidence that during chronic disease, such as phlebolymphoedema and lymphoedema, many extracellular matrix component are actively involved in the genesis and maintenance of the same pathology. Such type of extracellular components have been recently demonstrated in vivo by Campisi, Fulcheri & coll. by using special immuno-histochemistry method. Extracellular Matrix 3D modifications are needed for the presence of proteic and fluid overload coming from alterations of transmural pressure mechanisms: there are many evidences indicating that some matrix metalloproteases allow the Extracellular Matrix to modify itself in order to "create" the appropriate space for the overload which, on its turn, is released only after the metalloprotease activity. Another very important aspect is represented by the modifications between extracellular and cellular comunication structures during phlebolymphoedema: it seems to be reasonale to postulate that before the overload beginning many modification of fibronectin happen, with cytoscheletal and vinculin reciprocal activity leading to the beginning of fluid overload. Moreover, it could be present a concomitant involvement of GAG and PG structure modification in linking/releasing enormous amount of water, together with a possible involvement of fibrillar structures not of the family of collagen. These and many other questions are still open and waiting for urgent answeres: during the course of lymphoedema it seems to be mandatory to look at the Extracellular Matrix as an active structure and not as an innocent bystander which takes parte only marginally in many chronic disease.

SI - 9

INNATE REACTION OF HUMAN SKIN TO INFECTION INVOLVES KERATINOCYTES, DENDRITIC CELLS, TISSUE FLUID AND LYMPHATIC SYSTEM

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The immune response of skin to infection involves keratinocytes (KC), Langerhans cells (LC) a subset of dendritic cells, then tissue fluid and lymph proteins, lymphatic endothelial (LEC) and lymph node cells. The mechanical barrier created by epidermis is only one factor protecting against penetration of microorganisms. This is the functional network of epidermal and skin resident and blood–derived migrating cells, their receptors and protein products that creates skin defence system.

Aim. To identify defensins, HLA DR and toll-like receptors in KC, cytokines, chemokines, complement and lysozyme in tissue fluid and lymph, toll-like receptors in LEC and LC, and antigen presentation in LC-lymphocyte clusters in skin of human lower limbs.

Methods. Studies were performed in 15 healthy volunteers.

Results. Keratinocytes from skin of lower leg expressed TLR 4, and weakly HLA DR and ICAAM1 in the basal and suprabasal layer. Around 40 CD1a LC per linear mm were detected in epidermis. No LC were seen in papillary or reticular dermis. β-defensin-2 was present in epidermis..Lymph contained all investigated cytokines, chemokines and complement at level different from that of serum. The IL1 concentration was 40%, of IL6 920%, TNFα 190%, IL8 990, IL10 1200%, MCP1 387% of that of serum. The C1q level was 5% and of CD3 22%, respectively. Lysozyme concentration was 50% of that of serum. Five to eight percent of lymph LC formed clusters with CD4 and CD8 lymphocytes.
Conclusions. Under physiological conditions skin from the medial aspect of human lower leg, a common site of ulcer formation, expresses antimicrobial receptors and contains proteins participating in immune processes.

S I - 10

DOES LYMPHATIC DRAINAGE EXIST FROM THE ARTERIAL WALL OF NORMAL AND ARTERIOSCLEROTIC CHANGED CORONARY ARTERIES? MORPHOLOGY COMPARISONS WITH INTERNAL THORACIC AND RADIAL ARTERY AND PRIMARY LYMPHEDEMA

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Introduction. In the available literature we found only three studies regarding the anatomical description of the coronary artery wall in the sense of lymphatic vasa vasorum. They described the lymphatics which drained the adventitia and part of media of coronary wall. The purpose of this study is to describe the lymphatic vessels of the large epicardial arteries without and with arteriosclerotic changes to the wall with possible morphological routes of inerstitial fluid drainage from their walls in human coronary arteries.

Material and Methods. In 30 human hearts aged between 3 months to 80 years, the lymphatics in the epicardium were injected with a mixture of 2% gelatine and India ink. The main trunks of the coronary arteries and veins were injected with 5% gelatine and various pigmented dyes. After fixation of the heart in 10% formol and dehydration with increasing concentrations of alcohols, the epicardial arteries, veins, lymphatics and adjacent muscle were cleared with methylsalicylate and evaluated under the dissecting microscope. Eleven hearts (8 males, 3 females) were obtained from patients with heart transplantation, age 28 to 60 years, histological and electron microscopy investigations of the right and left coronary arteries were made. From 12 human beings aged 50-80 years after death the internal thoracic arteries and radial arteries were taken and processed with histological methods.

Results. 1/Lymphatics were not found in the wall of normal and atherosclerotic coronary arteries. 2/Lymphatics were localised in normal and atherosclerotic changed arteries periadventitially only. Lymphatics were absent in all 3 layers of coronary wall. 3/In distinction from blood vasa vasorum lymphatic vessels did not ingrow into the atherosclerotic artery wall. 4/Lymphatics run in a distance 3 um to 1mm from the coronary artery wall. 5/Lymphatics were closer to the veins than to the arteries. 6/The arrangement of morphological structures in the coronary wall in all 6 types of atherosclerosis worsen the outflow of lipoproteins. 7/The histological stucture of internal thoracic artery and radial artery is in some features different from structural arrangement of the coronary wall. 8/The similarity of the lack of lymphatics in the coronary wall is discussed in regards to the lack of lymphatics in primary lymphedema.

This research was aided by support from research project of Ministry of education Youth and Sport 0021620807

Session II: Primary and Secondary Prevention of Lymphedema

S II - 1

THE PREVENTION OF LYMPHEDEMA NEEDS KNOWLEDGE OF GROSS ANATOMY

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In answer to the question "why does lymphedema develop in one patient and not in another?" we feel that the answer lies in the intersection of two deciding factors:

1 – Surgical destruction and/or radiotherapy of the axillary or inguinal femoral lymph node center, which is logical for treatment of malignancies.

2 – The presence of a wound in the major compensatory pathway for lymphatic drainage of this limb, whether the wound is recent or old (Mascagni's pathway for the upper limbs).

The first context is absolutely necessary but not sufficient for formation of lymphedema; the second one makes this assumption sufficient. The combination of the two leads to lymphedema in 100% of cases, all the more when there were post surgical complications.

Conclusion. The occurrence of lymphedema is not a question of luck or fate. It occurs logically, and requires the combination of two destructive approaches:

– One which can be considered positive because it is directed against malignancy.

– The other, which is negative, harmful and totally unnecessary.

It is against this latter approach that the lymphologist must seek to promote the concept of ACTIVE PREVENTION as far as possible.

S II - 2

MODERN STRATEGIES OF ONCOLOGICAL SURGERY

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In recent years, the management of malignant tumors is orientated to Taylored treatments. Surgeons were the precursors of this approach, and I take breast cancer and cutaneous melanoma as examples to show how "conservative" surgery was studied and defined. In the middle of the 6'0s, a great discussion started to give an answer to the question whether or not an enlarged surgical procedure was necessary for solid tumors without clinically detectable node metastases. Breast Cancer was the first to be taken into consideration. The so called "Moscow Trial" was designed in 1962 to determine if an internal mammary node dissection is indicated in patients with breast cancer: patients with breast cancer were randomized to receive either "radical mastectomy" or "radical mastectomy with internal mammary node dissection". Results of this study indicated no benefits following the more extent surgery and internal mammary node dissection was no longer indicated. A few years later a randomized clinical trial was planned to answer the question whether or not a regional dissection is mandatory in patients with melanoma of the skin located at the extremities without clinically detectable node metastases. Patients were randomized to receive either wide excision and immediate node dissection or wide excision and node dissection delayed at the time of appearance of clinically detectable regional node metastases. The two approaches gave the same survival rates and for this reason the elective treatment was defined to be wide excision and regional node dissection devoted to patients with clinically detectable node metastases only. These results were confirmed by a later study which included patients with cutaneous melanoma located at the trunk with thickness greater than 1.5mm (WHO trial 14).
Following public educational campaigns, breast cancer started to be recognized more and more frequently smaller than 2 cm in maximum diameter and a new question raised: is total mastectomy necessary for these small tumors? A randomized clinical trial was designed by Umberto Veronesi at the NCI in Milan, the aim of which was to determine whether "radical mastectomy" had to be performed in such cases or a "quadrantectomy" and radiation therapy of the remaining breast was sufficient to control the disease locally. Following this study, quadrantectomy of the breast became the treatment of choice.
Early in the 70's, when Alex Breslow indicated that maximum tumor thickness of primary melanoma is the main prognostic factor for these patients, a similar question arose: is wide excision (3 to 5 cm margins) necessary for patients with primary melanoma thinner than 2 mm? A randomized study was designed to answer this question: patients with melanoma thinner than 2 mm were randomized to receive either wide or narrow (1cm margin) excision. Results of this study indicated that "narrow" excision is as effective as the "wide". Early in the '90ties Donald Morton defined "sentinel" the first node on the way of dissemination of cutaneous melanoma and suggested the sentinel node biopsy as a procedure to identify patients who need radical dissection of regional nodes. This suggestion was followed by many surgeons and sentinel node biopsy is now very popular. The question which needs an answer is: patients with microscopic deposits in regional nodes do better than patients with macroscopic deposits following radical node dissection? There is no final answer at present, and we are waiting for results of a randomized study, but results of WHO Trial 14 and a retrospective analysis carried on by the AJCC Melanoma Committee to define the TNM melanoma staging system seem to indicate a positive answer.

S II - 3

THE LYMPHOEDEMA (PREVENTION) IN MAJOR ORTHOPEDIC SURGERY

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Lymphoedema of the limbs after orthopedic surgery is a quite event (both in elective or traumatic surgery).
Surgical trauma can accelerate the primary linfoedema manifestation.
Orthopedic oncologic surgery, more often, can provoke secondary lymphoedema, particularly post pelvis or limbs surgery (axillary or groin region expecially), but this observation is the same that we find in oncologic surgery widespread (lymphnode ablation, radiotherapy).
The prevention of lymphoedema in major orthopedic surgery consists to evoid all situations that can damage the lymphatic system: infection; lymphonodal and lymphtic injury; inadequate and extensive incisions; abnormal compression (ematoma and more).

S II - 4

ROLE OF RADIOTHERAPIC PROTOCOL IN PRIMARY PREVENTION OF SECONDARY LYMPHEDEMA

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In subjects treated with radiotherapy that included lymphatic stations that received total doses ranging from 40 to 70 Gy, could be pointed out signs of atrophy in lymphatic structures.
In some cases is present a lymphocites lack of balance of the lymphonodal cortex; otherwise could be observed a proper substitution with adipous tissue. The subsequence is, after, the presence of dense collagen with less or more extension of fibrosis and areas of calcifications.
The prevention of the late damage consists above all in the application of a good technic of radiotherapy to assure a correct distribution of dosage. Other problems could origin from the division of dosage and from the interaction with other therapies, as surgical as medical.
Modern radiotherapy is addressed to avoid damages of the sourrounding anatomical structures of the target volume. It represent the research of the right compromise from the therapeutical effectiveness and the redution of damage on healthy tissues.

S II - 5

RISK FACTORS IN LYMPHEDEMA – HOW TO COMBAT THEM IN FAVOUR OF LYMPHEDEMA PREVENTION *(REVIEW)*

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The purpose of this contribution is to present and point out main factors of peripheral lymphedema development and to use this knowladge, in appropriate relations, to lymphedema prevention. Lymphedema is caused by pathological changes in lymph resorption and/or transportation having primary (congenital lymfangiodysplasia) or secondary origin (outside the lymphatic system). Pathological changes lead to decreased transport capacity, lymphostasis and high protein edema of the cutaneous and interstitial tissues. Furthermore, to chronic inflammation, progressive fibrosis and frequent complications. Prevention of lymphedema – How we have to care about lymphedema prevention? In general, in the management of any disease during its diagnostic phase the main goal of our effort should be the identification of "risk-individuals" suffering of lymph circulation insufficiency without clinical presentation of edema ("latent" lymphedema). In general, these individuals have to be examined noninvasively. In the phase of treatment (especially surgical) of any disease the main goal in lymphedema prevention is to preserve existing lymphatic structures and vessels. Having in mind this requirement we have to be very careful when carrying out e.g. lymphadenectomy, radioterapy, reconstructive vascular surgery, venous system surgery, dissections, excisions etc. Risk factors of lymphedema are clear enough in the secondary type while in the primary type they are more or less hidden. Nevertheles, there exsists possible approach to primary lymphedema prevention based on the fact of its frequent familial incidence (approximately 40%, with females prevalence). Therefor, family members of the patients suffering from primary lymphedema are "individuals at risk" and should be examined (family and patients' history, physical examination of the extremities, lymphangioscintigraphy, genetic examination, event. others) to prove or rule out inherited insufficiency of the lymph system ("latent" stage of lymphedema). In positive findings we have to treat those patients preventively (general preventive management is presented). The conclusions are based on the authors' experience with more than 1.200 lymphedema patients examined and treated in lymphocentres in Olomouc and Brno (period 1982-2004, follow-up of "risk patients" reaches 12 years).

S II - 6

A NEW PROTOCOL OF PREVENTION OF SECONDARY LYMPHEDEMA

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The main causes of secondary lymphedema are represented by surgical operations, irradiations, infections, traumas and metastatic lymphnodal involvement.
High risk surgical operations include: radical mastectomy, Wertheim-Meigs operation, oncologic operation in urology, abdominal surgery, lymphadenectomies in "crucial areas" (groin and axilla). Other operations are represented by exeresis of lipomas in critical sites, saphenectomy and inguino-crural hernioplasty.
It is important to educate the patient to examine himself, to visit him periodically and to perform a lymphangioscintigraphy, which can point out an initial lymphatic stasis before its clinical manifestation (stage I A lymphedema).
The protocol for prevention of secondary lymphedema used by the Authors includes clinical and lymphoscintigraphic parameters and could be applied by all different specialists (general surgeons, urologists, gynaecologists, oncologists, radiotherapists, etc.) during their daily clinical activity to try to get to the aim of preventing lymphedema.
Finally, Authors present their experience in the use of microlymphatic-venous anastomoses performed at the same time of lymph nodal dissection, underlying indications and long term results.

S II - 7

LYMPHOLOGY IN EMERGENCY ROOM

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In this clinical review we talk about the clinical approach to lymphatic diseases in Emergency area. Erysipelas, Lymphedema, Chylousperitonitis, Chylous Ascites, ChylousThorax, Chylopericardium and trauma of Thoracic Duct are some of the diseases we are analyzing from an epidemiological, clinical and therapeutical point of view.
We discuss the multidisciplinary aspects of lymphopathology in Emergency Room such as recognizing local and general signs and symptoms and the right management in order to reduce recurrences and complications like Septicemia after Acute Lymphangitis.
Our experience personal concerns about 1530 patients that have been admitted to our Emergency Room, these patients have been evaluated by lymphologycaly trained physicians and about 1,31% have been diagnosed having emergent lymphologycal diseases.

Keyword. Acute lymphangitis. Erysipelas. Trauma of thoracic duct.

S II - 8

SCHEMATIC VIEWS OF DIFFERENT PATHOPHYSIOLOGICAL SITUATIONS WHICH CAUSE LYMPHEDEMA

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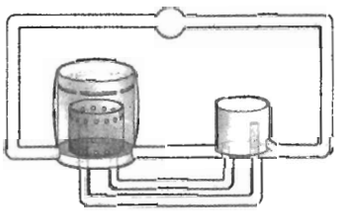
Introduction. The cause of lymph drainage disorder and thus alsoof lymphedema may be found in lymph production, lymph transport, lymph nodes damages, severe definitive venous occlusion. The oedema may be rich or poor of proteins. Mechanical or functional causes are involved in onset of lymphedema with low or high lymph output.

Method. In some cases, when the lymph burden is high and despite an increase output the transport capacity is overwhelmed. A schematic picture explains the different situations.

Results. A glass container connected with the arterial and venous circuits receives the interstitial fluid. This container possesses holes at its top and when it is full, the fluid runs into a coupled bladder which fills and simulates oedema. Inside the glass container takes place a smaller container connected to a second small container like communicating vessels which are linked by two tubes. The second container joins the venous circuit by a pipe which looks like a lymphatic collector.



Conclusion. All types of lymphedema may be explain by this picture.

Session III: Clinical Lymphology

S III - 1

CLINICAL ASPECTS OF LYMPHEDEMA

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Disequilibrium between lymphatic loads and transport capacity result in the increase of the volume of interstitial fluid and edema. In cases of simple, uncomplicated lymphedema lymphatic loads are normal, transport capacity is greatly reduced. Lymphedema combination forms arise, if lymphatic loads are increased and transport capacity is decreased. In the diagnosis and in the management of diseases in which swollen extremities are present both functional disturbances have to be taken into consideration. A good knowledge of the pathophysiology of microcirculation is mandatory for the adequate care of patients suffering from lymphedema.
The lecture deals with the diagnostic tools which enable us to elucidate the etiopathology of lymphedemas.

S III - 2

CEAP-L: PROPOSAL OF A NEW CLASSIFICATION OF LYMPHEDEMA OF THE LIMBS

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A method to classificate lymphedema has been needed to gather important information on the clinical evolution of the desease using a common language and an easy clinical applicability.
A proposal of a new classification of the limb lymphedema is inspired to C.E.A.P. for chronic venous insuffiency of the lower limb. The classification makes use of the acronym C.E.A.P. adding the letter L to underline the aspect "Lymphedema".
The classification has already been appraised in 2 years activity at the unit of vascular surgery of Ferrara and at the moment is under close examination by a group of work involving many Italian scientific associations.
Clinical classification is based on the most objective sign in these patients, edema which is classified in 5 classes.
Etiologic aspect considers 2 types of alterations of the lymphatic system:congenital and acquired or secondary.
Anatomic aspect has the object to precise the anatomic stuctures involved.
Physiopatological miments are gathered in 5 group: agenesia or hypoplasia (absence of lymphatic vessels or scarce presence), hyperplasia (greater representation of lymphatics): in this case a valvular reflux pathology is frequentely associated;obstruction (by parasites, tumors, after surgery operations and radioteraphy); reflux (primitive desease of valvs); overload (equal to dynamic deficiency, according Foldi).
The proposal of a new classification of lymphedema C.E.A.P. – L will allow to arrange patients with a definite mark, creating the conditions for a better clinic comparison and the possibility to study these patients in well defined statistic groups and not in an evolutive period that covers many aspects under a single mark.

S III - 3

CLINICAL AND PHYSIOPATOLOGICAL CHARACTERISTIC OF LYMPHOEDEMA, PHLEBOEDEMA AND PHLEBOLYMPHOEDEMA

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We examined with a wide casuistry, increased in the course of the years, the various clinical characteristics of Lymphoedema, Phleboedema and Phlebolymphoedema that subtend the role carried out from the physiopathology that allows in the greater part of the cases a differential diagnosis.

S III - 4

DEPENDING LYMPHEDEMA

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Depending lymphedema is a clinical condition frequently observed in medical practice but generally undervalued and usually unconsidered in classification of lymphatic diseases.
A very common question regards the possibility to define the depending limphedema as a pure or a mixed limphoedema, because of the primary impair of venous return in pathophysiology: almost in all cases, in fact, this kind of edema is derived from a complete or incomplete immobilisation, with increase of hydrostatic pressure and reduction of muscle pump action. These conditions lead to a venous stasis in the sub- and prefascial veins and an increase of protein loss from venous limb of capillaries and venules. Another question is the possibility to include in the same group syndromes derived from various phisyiological or pathological conditions, whose clinical importance can be very different. For istance, a depending linphedema can be observed in healthy persons during or after prolonged air travels but also in old people with heart or pulmonary diseases, specially if they remain seated for many hours a day. In these last patients, the edema can be increased from a concomitant reduction of aspirative endothoracic force and from other causes derived from the main disease. We should take an interest also in depending lymphedema related to central and peripheral paresis (apoplectic insult, paraplegia, damage to the plexus brachialis). In the flaccid paresis for istance, where there is a low muscle tone and no muscle pump action at all, there is also a low venous tone and the resultant hydrostatic pressure is especially high.
In my opinion, we can classify reversible depending lymphedema, derived from transitory conditions such as prolonged travel or short partial immobilitation, and irreversible depending lymphedema, derived from important clinical conditions such as neurological or internal ones.
Il all cases, all kind of depending limphedema cannot be neglected, because of the possibility of a tissue damage in the long term. The successful treatment is related to the stage of compensation: the compensation initially occurs in the prefascial lymph outflow region (latent edema) wich becomes decompensated if overloaded (visible edema). In some condition as spastic paresis, the regional subfascial lymphatic system responds with lymphangiospasm. Where sympathetic innervation is interrupted (e.g. brachial plexus paralysis) there is passive hyperaemia of the terminal vessels with vascular dilatation and lymphangioparalysis.
An early treatment of this kind of edema can avoid the serious possible conseguences due to danger of tissue fibrosis. A planning of linphedema treatment should be carried out in all orthopaedic or neurological risk conditions.

S III - 5

THE INDIVIDUAL REHABILITATION PLAN OF THE SUBJECT AFFECTED BY LYMPHOEDEMA

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Regarding the rehabilitation individual overall plan of the subject affected by lymphoedema, it appears necessary to make a distinction between functional rehabilitation interventions addressed to the impairment and the rehabilitation of the biological, psychological and social totality in its continuous changeability during lifetime.
The total needs of the subject with lymphoedema demand a interdisciplinary approach, with strong integration between all the necessary activities and interventions. When more professionals are present on the same person, a sharing of the principles and the philosophy that guide the single participations is necessary, in order to work according to a common and shared general project.
The modalities of construction of the individual rehabilitation overall plan as well as of the therapeutic programs related to the single necessary interventions are presented here. The rehabilitation diagnosis turns out to be preliminary and central to the construction of the rehabilitation plan, and it is based on the following elements:

- to characterize, to measure and to assess the various typologies of patient's impairment and disability
- to characterize their single gradient of modifiability together with the therapeutic modalities and instruments which are more useful, together with the necessary intervention time.

In conclusion we present the synthesis of a rehabilitation overall plan of a patient affected by lymphoedema in the upper right limb, secondary to a breast tumor after axillary lymphoadenectomy.

S III - 6

CHRONIC LYMPHEDEMA AND ADIPOCYTE PROLIFERATION: CLINICAL THERAPEUTIC IMPLICATIONS

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Introduction. The rate of blood and lymph flow through adipose tissue is inversely proportional to tissue growth. Decreased flow is believed to stimulate lipogenesis and increased deposition of fat. Adipose tissue hypertrophy appears related to ingestion of lipids from the stagnant lymph by macrophages and adipose cells. Liposuction is a logical approach to address the above pathophysiology since the hypertrophied adipose tissue is effectively removed.
Patients and methods: 44 women with a mean age of 63 years and a mean duration of the edema (non-pitting, grade II-III) of 11 years underwent liposuction. All patients had failed conservative treatment prior to surgery. The amount of adipose tissue in both arms was analyzed pre- and postoperatively with DEXA (Dual Energy X-ray Absorptiometry) in one patient at 3 months, and with VR-CT (volume rendering computer tomograpy) in another at 12 months.
Results. Mean preoperative edema volume was 1660 ml. Postoperative mean reduction was 113% at follow up 3 months to 5 years postoperatively. Aspirate mean volume obtained under bloodless conditions was 1055 ml. Mean adipose tissue volume and lymph/interstitial fluid volume was 928 ml (90%) and 126 ml (10%) respectively. Excess amount of adipose tissue in the edematous arm was found with both DEXA (510 grams) and VR-CT (1321 grams) preoperatively. Postoperativ values were –138 grams (DEXA) and –180 grams (VR-CT), i.e. a slight overcorrection.
Conclusion. Patients with chronic arm lymphedema after breast cancer treatment develop large amounts of newly formed subcutaneous adipose tissue, which precludes complete limb reduction utilizing microsurgical reconstruction or conservative treatment methods. Although incompletely understood, this adipocyte proliferation has important mechanistic and therapeutic implications. Deep pitting in a lymphedematous arm implies excess lymph accumulation and warrants conservative treatment. Absent or minimal pitting, found in grade II-III edema, indicates excess adipose tissue. Liposuction is indicated in patients who fail to respond to conservative or microsurgical treatment because the hypertrophy of the subcutaneous adipose tissue is not removed with these methods. Biological study of the extracted materials may shed insight into the molecular mechanisms of the disease process.

S III - 7

MORBID OBESITY AND LYMPHATIC MICROANGIOPATHY

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Morbid obesity is a risk factor for venous, arterial and lymphatic disease and this may be mediated partly through change in the haemostatic system via endothelial damage. Obesity is associated with expanded circulatory volume and an increased extracellular to intracellular fluid ratio with enhanced body sodium content. The extracellular water increase is a consequence of a trapping in the skin and subcutaneous tissue of fluid, extravasated plasma proteins, and other macromolecules. Therefore, lymphatic dysfunction is likely to result from an increase in albumin and water transcapillary leakage and a saturation of lymphatic pumps. The mechanisms leading to an increase in albumin and water transcapillary leakage may result from an increase in capillary flow and capillary pressure. Particularly, partial obliterations of the superficial capillary network, cutaneous reflux and increased permeability of capillary fragments occurred. Long-standing lymphedema is characterized by defective lymphatic (lymphangion) propulsion from an imbalance of mediators regulating vasomotion.
Lymphatic dysfunction seems to be reduced with increasing age. But, it is more severe in gluteo-femoral obesity.
Then, lymphatic dysfunction may be a consequence of an excess in crural adiposity with an increase in venous and capillary pressure and capillary filtration and a reduction in lymph return. Moreover, is also consistent with a defect in lymph circulation on triglyceride return to blood flow (with increase of crural adipocytes).
Integrated therapy with vascular-acting drugs, biguanides, and lymph drainage may alleviate the symptoms and improve hemodynamic functions (capillary filtration and lymph function). Therefore, spironolattone and derivatives or ACE inhibitors may be helpful for a short time during outbreaks of the symptoms.

Session IV: Imaging in Lymphology

S IV - 1

LYMPHATIC VASOMOTION AND FLOWMOTION

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Microlymphography allows to visualize and study the microlymphatic meshes through a subdermal injection of 0.01 ml FICT dextran 150.000. Dextran is drained from the superficial network to precollectors and to deep lymphatic vessels but its flow is so slow that is not visible with the naked eye. Aim of the study was to visualize and analyse the intramicrolymphatic flow.
We aquired on PC the VHS records of 35 microlymphographies belonging to 10 healthy subjects (6 F, 4 M, mean age 53 +/- 12), 10 patients (5 F, 5 M, mean age 49 +/- 8) suffering from CVI, Widmer's II stage, 10 patients (9 F, 1M, mean age 35 +/- 8) with recent lymphoedema (soft lymphoedema, less than 2 years old), 5 patients (4 F, 1 M, mean age 65 +/- 6) with fibrotic lymphoedema (old lymphoedema).
The films were reversed on PC with software Videocap and acquisition card/board (Miro Video DC30). An AVI file was realized for each microlymphography with a 3 Hz frame rate (frame size 720 x 540). Each AVI file was processed by the programme Adobe Premiere 4.2, at a speed rate X5, X8, X32. So, we could observe microlymphographies at a speed 5, 8 and 32 times grater than real time. Consequently, this method allowed us to see a 10-minute microlymphography in 2 minutes and so on. Images collected in this way showed the presence of an intralymphatic flow with different features according to the group of patients considered. We measured the speed of such lymphatic flows through the simple ratio space/time. Space was measured through a millimetered grid, time was measured by the timecode of Adobe Premiere 4.2 software. Speed was then divided by 5, 8 and 32 according to the speed rate used. This method highlighted two types of intramicrolymphatic flow:
1) a very slow granular flow, with an average speed of 10 +/- 4 m/sec;
2) a pulsed flow, at a speed of 91 +/- 58 m/sec., in which the rate of accelerations was 1 in 60 +/- 25 sec.
In patients with CVI, we sometimes observed a pulsed flow, but never a granular flow. In patients with lymphoedema, we frequently found a slow granular flow and, rarely, a pulsed flow. In patients with fibrotic lymphoedema, we could never detect any kind of lymphatic flow. In healthy subjects we could not visualize any type of intramicrolymphatic flow. Therefore, flow in the healthy is likely to be even slower than the flows we visualized and studied. Analysing videos at a speed greater than 32 times, impossible at present due to hardware and software we use, it is likely to highlight the intramicrolymphatic flow in the healthy. Monitoring microlymphatic flow in the healthy and in patients can help understanding the physiopathology of lymphatic flow.

S IV - 2

LYMPHOSCINTIGRAPHY HELPS TO CLASSIFY EDEMA OF VARIOUS ETIOLOGY AND TO ESTABLISH APPROPRIATE THERAPY

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Lymphoscintigraphy has become a routine diagnostic procedure in our hands in each case of edema of limbs of non-systemic etiology. In combination with Doppler investigation of the venous system it allows to establish diagnosis with a high level of accuracy.
Lymphoscintigraphy allows to: 1. show lack of absorption of tracer, 2. if absorbed to show speed of tracer flow, 3. visualize lymph nodes in anatomical and NON-anatomical "new" sites, 4. visualize lymphatic collaterals, 5. provide pictures of inflammatory foci in superficial and deep tissues due to extravasation and phagocytosis of tracer with aggregated albumin, 6. show flow of tracer after mechanical massage proving its efficiency, 7.abstain from massage in cases of vast clinically not diagnosed inflammatory changes, 8. show areas of more intensive edema requiring more massage, 9. compare the pre- and posttreatment pictures, 10. evaluate the patency of microsurgical shunt by measuring the radioactivity over liver. Taken together, lymphoscintigraphy gives insight into the topographical distribution of edema, its intensity, location of inflamed tissues, efficacy of mechanical drainage. This allows to modulate the therapeutic protocol and supplement massage with drugs and in some cases provide indications for microsurgical decompressing procedures.

S IV - 3

ULTRASONIC, MAGNETIC RESONANCE, SPECTROSCOPIC AND HISTOLOGICAL STUDIES OF CUTANEOUS BIOPSIES OF PATIENTS AFFECTED WITH CHRONIC LYMPHOEDEMA

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Introduction. The oedematous investigation by means of sonogram does not always correlate well with MRI. Therefore, we decided to compare the imaging of biopsies with histological studies.

Aims.
1. To define the intralobular hyperechogenicity in ultrasonic imaging.
2. The confirmation of the ability to detect lymphatic collectors by means of ultrasound.
3. To understand in cases of chronic lymphoedema the subcutaneous trabecula components which are responsible for the honeycomb pattern observed by means of various imaging techniques.
4. Which imaging technique or combination of techniques would the most valid in the identification of the fatty, fibrous, and fluid components of chronic lymphoedema?

Material and method. Our study was performed on biopsies taken during lymphonodal free flap transfer surgery.
All patients presented with chronic persistent lymphoedema, which were refractory to the physical therapy course of treatment suggested by the therapeutic consensus as defined by the ISL.
We performed a sonogram by means of a 13.5MHz high frequency linear head.
On the MRI, we used sequential slices: spin echo: T1 sagittal, T1 coronal, T1 transversal; turbo spin echo: T2 sagittal with and without Fat Sat; STIR: sagittal.
Using protonic spectroscopy CSI (6x6x5 mm voxels), we also performed a spectral analysis of the fat and water peaks.
The histological analysis was performed by means of a photonic microscope. Before hand, we included paraffin within the tissue.
Specific coloration technique such as the Trichromic of Masson was used to allow a better visualisation of the fibrous tissue.

Results. Our study established that in cases of chronic lymphoedema a fibrous component is present not only within the interlobular septa but also within the intralobular sites. We do feel that the hypodermal trabeculae responsible for the honeycomb pattern are actually tissue channels enlarged by liquid or fibrous build up. Although those channels are present in healthy subject they are not enlarged. Therefore, it would be more appropriate to state that the honeycomb pattern given by the enlargement of hypodermal trabeculae is true to type of chronic lymphoedema.
Sonogram imaging is more sensitive to tissue architectural changes. On the other hand, MRI is more sensitive to tissue chemical changes. Therefore, the correlation of sonogram, magnetic resonance, spectroscopic, and histological studies allows a valid identification of the fatty, fibrous, and fluid components of chronic lymphoedema.

S IV - 4

LYMPHEDEMA: COMPUTERING TOMOGRAPHY AND THERAPEUTICAL IMPLICATIONS

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Computering Tomography shows us indications about the supra-fascial compartiment and the sub-fascial one.
220 patients suffering from lynphedema (86 with primary kind, 134 with secondary kind), age ranging between 12 and 83 years, underwent C.T. examination of the two limbs in comparison..
Was considered the main signal present in supra-fascial compartment of the limb at various level of its. The values strongly negative (-70, -80) was corresponding to the fat; the values ranging between –10 and +15 represented the main water component; The values over +50, +60 testified the presence of tissular perilymphangiosclerosis.
The CT examination considered the following aspect :

- thikness of supra and sub-fascial compartiment at various level of the limb;
- the main tissular component of supra-fascial tissue at various level;
- the assessment of the main articulation of the limb;
- the trophism of various muscolar component of the limb.

In function of the prevailing supra-fascial signal it's possible to address the therapeutical address: CPT+drugs (when it was present the combined presence of water and sclerosis of supra-fascial tissular component – 37% of subjects), CPT+drugs+microsurgery (when it's prevailing the idric supra-fascial tissular component), CPT+liposuction (in subject with prevailing suprafascial fat component - 16% of patients).
In this preliminary study we can conclude that Computering Tomography permit us to identify the various tissular aspects of lymphedematous limb and to address the tailored therapeutical approach. Computering tomography is useful also to the monitoring of the illness.

S IV - 5

LYMPHEDEMA: ULTRASOUND AND NUCLEAR MAGNETIC RESONANCE IMAGING IN CORRELATION WITH TISSUE HISTOLOGY

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Ultrasound imaging is a frequently used technique to define the stage of a lymph edematous limb according the three stages scale (consensus document of the International Society of Lymphology), although the consistence of edema is barely known.
Previous studies have shown that ultrasound echogenicity is related to the evolution of lymph edema and changes of echogenicity are in function of the treatment that patients with edema receive.
The aim of the present study is investigating the relationship between ultrasound imaging, MRI and microscopical preparations of the skin and subcutaneous tissues. Two female human cadavers with an unilateral breast amputation and axillary dissection are studied. Although no differences in circumference of both arms are present, dissection showed structural alternations of the fat tissue and skin adhesions. These alternations can be evaluated with ultrasound imaging. By means of nuclear magnetic imaging and histological preparations fat and water distribution will be described.
This presentation will be illustrated with numerous pictures.

S IV - 6

LYMPHATIC SYSTEM IMAGING BY MEANS OF ULTRASOUND AND MAGNETIC RESONANCE

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Purpose. To first confirm the possible visualisation of the lymphatic collectors by means of an ultrasound head of 13.5Mhz and second to specify in asymptomatic and lymphedema cases the echogenic characters of the lymphatic collectors.
Method. Using cadaveric piglet parts and after rendering the lymphatic collectors opaque we correlated the ultrasound imaging with the MRI. We limited the imaging study to 3 piglets and using 4 legs. Then, we selected 5 asymptomatic human subjects and 5 human subjects affected by lymphedema on which we were looking for similar ultrasound imaging patterns than the one found on piglets.
Results. The injection of modified Gerota's mass allowed for a precise identification of lymphatic collector, which were visualised by skin transparency. The ferromagnetic artefacts generated by the modified Gerota's mass allowed the identification of the lymphatic collectors on MRI. The identification of the piglet lymphatic collectors by means of the ultrasound imaging was correlated with both the MRI and dissection.
In man, through the use of ultrasound imaging we can detect collectors of small size. These small collectors take the appearance of linear hypodermic hyperechogenic structures along the limb longitudinal axis. The bigger collectors take the appearance of double hyperechogenic lines with a central anechogenic light, which at times flows into a lymphatic nod.
Conclusion. The lymphatic collectors can be detected by means of ultrasonic head of 13,5 Mhz. However, the detection remains thorny on healthy human subjects.
Key Words. Lymphatic collectors - Lymphedema-Magnetic resonance Imaging (MRI) - Ultrasonography

S IV - 7

DIFFERENTIAL DIAGNOSIS BETWEEN NON BATTERICAL LYMPHANGITIES AND DERMOHYPODERMITIES

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The study has like job hypothesis that as in Chronic the Venous Insufficiency there are non-septic flogosis,
as in the severe lymphoedema there aseptic flogosi. 18 women have been selected introducing a lymphoedema
of the upper limb to III stage ISL with a dermohypodermitis not accompanied from fever and lasting from at least ten days. The women have been divided in two homogenous groups: the first group has been treated with antibiotics only. The second group has been treated with steroid therapy. Cortisone as been chosen as anti-inflammatory and is well-known doesn't have any benefit in the septic conditions, indeed they can get worse reducing the immunity responses. The results of the therapies have been estimated as reduction of the flogosis and the pain. The antibiotics administration has been almost indifferent on the course of the affection
Positive results have been obtained with the cortisone therapy, reducing the flogosis and the pain.

S IV - 8

"REGULATION'S PHARMACO THERAPY": A NEW HYPOTHESIS FOR UNDERSTANDING OF THE WORKING OF THE EXTRA CELLULAR STRUCTURES IN PHLEBO LIMPHOLOGY?

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Under a pharmacological view point, it is defined as "drug" any substances capable to get preventive and/or therapeutic activity related to human (or animal) diseases or any substance wich may be administered to man in order to correct or modify organic functions. Phamacognosy has been created and defined in 1892 and at present it is a "cluster" of Pharmacology it takes care of drugs or substances mainly those of vegetable origin.
The importance of the knowledge of biochemistry and phisiology, integrated with that of vegetable biology could allow to better understand wich type at interaction any drug must belonging to get a more correct activity. Buy meaning " Regulation's drugs" we refer to substances or their combinations able to promote not only structural but also " functional " modifications through a direct or undirect mechanism on or more extra cellular matrix structures.
Regarding it, new data in microcirculatory disorders could help us in better enderstanding the hematic and lymphatic patterns: at present will recognize osmothic and onchothic play a very important role in the correct and physiologic activity of tissue – capillary unit (Merlén, Curri) and limphatic capillary unit. These relationships suggest both district strongly behave depending on extra cellular matrix condition : it is so easy understandable how concomitant cellular/extra cellular target therapy may present a new goal in clinical practice, and on this way seem to run ahed many experimental and clinical data coming from microvascular studies in pheboliymphoedema " in vivo " methodologic studies on micro vessels (optic probe video capillaroscopy, doppler laser flowmetry, imaging doppler laser) have demonstred that (micro) vessel activity is more efficient when extra cellular matrix structures are in the most physiologic conditions and moreover, that it is today possible to take care of some extra cellular matrix aspects by using, in clinical practice, Taraxacum officinalis, Calendula officinalis, Leptandra, Echinacea angustifolia, Cardus marianus, Sanguinaria canadensis (Lymdiaral® Pascoe – Named Lesmo, Italia) other, well know examples of vegetable substances (" drug " in medical doctor mind) used by specialist is that of Diosmin documented in limphology since 1985 (Casley – Smith) and in post – phlebitic ulcus cruris in 1985 and 1988 (Morere).Other further examples are reported in Pharmacology in these evidences, it seems to be for seen able a new conceptual hypothesis comprehending the " study " (under a global view point) of both cellular and extra cellular structures, and their relationships, related to could it be true like the hypothesis that some pharmacotherapeutic agents "cooperate" with pharmacologic agents by modulating (morphologically ? temporary, biochemically ? humorally ?) a still unknown cellular and/or extra cellular response in order to get its best result. Even if we must entirely agree with pharmacology it seems to be reasonably correct to propose the concept of "Regulation Pharmacotherapy" to be applied as far today, for extra cellular structures: such new interpretative hypothesis must absolutely fellow and go together with current knowledge, so that only their reciprocal association will help us in avoiding confusion and misunderstanding.

Session V: Nucleasr Medicine and Lymphatic System

S V - 1

LYMPHOSCINTIGRAPHIC INVESTIGATIONS AND CLINIC OF THE EDEMATOUS LIMB

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Using lymphoscintigraphies, edematous limbs (mainly lower limbedemas) can be investigated following various technical protocols. However, some proposed protocols, if they are well suited for secondary and/or clinically staged II (and more) limbedemas, are not when applied to edema of unknown origin (Primary?) and/or staged I.
The underlying technical problems will be analyzed and the different ways to solve the problems and/or questions raised by the clinicians will be proposed for each clinical presentation of lower limb edema.

S V - 2

SENTINEL NODE DISSECTION IN BREAST CANCER : ITS IMPACT ON MORBIDITY AND LYMPHEDEMA OCCURRENCE IN A SINGLE INSTITUTION

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The lymph node status is a major pronostic factor in breast cancer. An extended axillary lymph node dissection (ALND) was usually recommended until the sentinel node technique was introduced in 1995 as an alternative to ALND. Progressively the sentinel node dissection has been validated and integrated as a routine method in breast cancer management in a large number of cancer centers. The purpose of the study was to examine the outcome of arm morbidity in breast cancer patients treated using the sentinel node method as compared to a reference group of breast patients treated with ALND.

Methods - Patients. It is a retrospective study comparing a group a 100 consecutive breast cancer patients treated since 2004 with lumpectomy and sentinel node dissection to a reference group of 100 breast cancer patients treated with surgery (radical modified mastectomy or lumpectomy) with a level I-II axillary node dissection between 2003 and 2004. The sentinel node protocol involved gamma-probe and dye guided dissection and all patients included in this study had a successful detection. All surgeons implied in this retrospective study were trained to the method and had previously completed a learning curve several years ago. The group comparison do not exhibit any difference when considering the clinical status, age and tumoral type (89 ductal - 11 lobular carcinomas and 91 ductal - 9 lobular carcinomas in the sentinel node and the reference group respectively). All patients received radiation therapy delivering 45 Gy 5 to 6 weeks after surgery. Subjective clinical signs reported by the patients were noticed : swelling with or without pitting, firmness, heaviness, numbness, tenderness and pain. A diagnosis of clinical lymphedema was accepted in accordance to the consensus published by the International Society of Lymphology.

Results. No patient who underwent sentinel node dissection developed infection or restricted arm movement. In this group one patient developed axillary seroma formation. Subjectively, 96% of the patients had either no or slight arm swelling, and had "good" or "excellent" overall arm function. This was contrasted with patients undergoing ALND where 13% developed axillary seroma formation and 2% developed restricted arm movement. Subjectively 21 (21%) patients developed axillary paresthesias, numbness or tenderness after ALND. For 2 (2%) patients with an objective clinically observed lymphedema in the sentinel node group there were 14 (14%) who developed a clinical lymphedema after ALND.

Conclusion. Sentinel node dissection is now a well established method in the management of small size breast cancer and is associated with less immediate and delayed morbidity as compared to ALND.

S V - 3

SENTINEL NODE STAGING OF RESECTABLE COLON CANCER: RESULTS OF A SINGLE CENTER OF GENERAL SURGERY

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Objective and Summary. Sentinel lymph node sampling, in patients with resectable colon cancer, improved identification of lymph node disease and identified patients likely to benefit from adjuvant therapy. This study examined whether sentinel node (SN) sampling accurately predicted lymph node status for patients with resectable colon cancer.

Methods. SN sampling involved peritumor injection of 1% isosulfan blue, followed by identification of all lymph node visualized within 10 minutes. SN sampling was performed on 20 patients enrolled, followed by multilevel sectioning of the nodes and examination after cytokeratin immunohistochemical staining.

Results. SNs were successfully located in 17 cases (85%), with an average of 2.1 nodes per patient. Immunohistochemical test demonstrated micrometased inside SN in 9 patient (53%). SNs were positive like the others region lymph nodes removed in 82,3% of cases, while this correlation was not achieved in 3 cases (17,6%).

Conclusion. SN sampling is simple technique and in our study SN examination predicted nodal status in 53% of cases.

S V - 4

RADIOISOTOPIC IDENTIFICATION OF SENTINEL LYMPHNODE AND PREVENTION OF LYMPHEDEMA SECONDARY TO SURGICAL TREATMENTS

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The sentinel lymph node biopsy is a new technique. This was developed as a test to determine if breast cancer has spread to the lymph ducts or lymph nodes in the axilla without having to do a traditional axillary lymph node dissection. Experience has shown us that the lymph ducts of the breast usually drain to one lymph node first, before draining through the rest of the lymph nodes underneath the arm. That first lymph node is called the sentinel lymph node. That is the lymph node that helps sound the warning that the cancer has spread. Lymph node mapping helps identify that lymph node, and a sentinel lymph node biopsy removes only that lymph node. The advantages to the sentinel lymph node procedure are many. There is no need to stay for a long period in the hospital. There is no need for a drain, or physical therapy exercises. Your recuperation from the procedure is faster. You are typically doing your regular activities within a few days, and the incision is well healed within a few weeks. A sentinel lymph node biopsy can lead to a more accurate assessment of whether the cancer has spread to the lymph nodes.

Secondary lymphedema is a fairly frequent complication of surgical treatment of the cancer, following lymhoadenectomy, particularly when the dissection is combined with radiotherapy. The surgical treatment of mammary cancer, combined with identification and biopsy of the sentinel nodes, has become more conservative and, at the same time, radiotheraphy (when necessary) now proves less aggressive and more efficacious, secondary lymphoedema is still reported with incidence rates ranging from 5 to 25%, with an increase of up to 35% and more, when dissection of the axillary lymph nodes is followed by radiotherapy. The incidence of limphedema severely decreases with the sentinel nodes biospy, avoiding a wide lymphnode excision.

S V - 5

LYMPHOSCINTIGRAPHY AND CLINIC EVIDENCE

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Lymphoscintigraphy Represents the diagnostic gold standard in the study of lymphedema, both in primary kinds and in secondary one.
The exam provides morphological and functional indications on lymphatic circulation, but it's necessary a good interpretation of dates by sanitary operators.
The morphological aspects are:
– Hypo genesis or agenesis of lymphatic stations or ways one.
– The presence and the extension of dermal back flow.
– The presence of lymph nodal stop at various levels of the limb (knee in the leg, Elbow in the arm).
– The presence of alternative ways.
We have studied 465 patients (186 six males and 279 females age ranging between 0 and seventy-nine years (primary, secondary, post traumatic, depending and functional – for example: after deep venous thrombosis).
The dermal back flow generally is proportioned to the clinical stage of lymphedema; it's partially regressing after the treatment and can be present also with healthy lymphatic stations (for example in the post-phlebitic syndrome or in iatrogenic lesions of lymphatic trunks).
In post traumatic lymphedemas dermal back flow is present in the area of the trauma. In these cases, if the lymph nodes of the root of the limb are normally represented, the prognosis is good. On the contrary, in case of poor visualization of lymph nodal stations at root of the limb, the prognosis is bad.
In depending lymphedema is observed a bilateral dermal back flow (usually at lower limbs). In these cases usually the inguinal stations and latero-iliac ways are normal.
In the post-phlebitic syndrome the dermal back flow is monolateral and rarely is together with a lymph nodes poor evidence at the root of the limb. The lymph nodal stop can be generally at knee level in the lower limbs, at elbow level in the upper limbs.
The lymph nodes normally, in our experience, are not visible. Their presence is a sign of difficult of lymphatic down flow.
They are also present in the contralateral health limbs of women with mastectomies as a witness of predisposition to the lymph stasis.
The alternative ways, well represented in some cases, address the physical treatment to best drainage. In other cases they appear after manual lymphatic drainage or other mechanical techniques of drainage.
In conclusion the lymphoscintigraphy gives us important informations on diagnosis, on therapeutical approach and on prognosis of lymphedema.

S V - 6

PARASTERNAL (PS) SENTINEL NODE (SN) BIOSPY IN BREAST CANCER (BC)

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Background and aim of the study. Lymphatic drainage towards the PS nodes (N) after intra-mammary and peri-tumoral (IP) injections (Inj) of labeled colloids for the visualisation of the SN in BC is reported (in association with axillary N visualisation) in around 30% of the cases and, less frequently, only towards these nodes. Up to now, only the axillary (Ax) SN are systematically biopted. We report here the results of the PS SN biopsy performed in 77 women with BC in addition to the dissection of the Ax SN.
Material and methods. 7 patients (mean age = 52.7 years: mean pT = 13.2 mm: 6 with lesion in inner quadrants) had only PS SN visualisation after the IP Inj. (PS+Ax- cases) (in these cases, Ax SN were visualised after one intradermal and paratumoral injection of the labelled colloid) and 70 (mean age = 55.7 years: mean pT = 12.9 mm: lesion in inner quadrants in 44 and in median in 12) had visualisation of both PS and Ax SN (PS+Ax+ cases).
Results. 2 ("28%") of the 7 PS+Ax- cases had pathologically (pN) positive (pN+) PS SN. The two had one lesion in the upper inner (UI) quadrant (Q) ("33%" of these patients with lesion in inner Q) and one had pN+ Ax N.
Among the 70 PS+Ax+ cases, 4 (5.7%) had pN+ PS SN. PS SN were pN+ and Ax SN pN- in 2 (lesions were in the UIQ and in the UOQ). For the 2 cases PS SN and Ax SN pN+, lesions were in the inferior median quadrant and in the UIQ. Ax SN were pN+ and the PS SN pN- in 7 (2 in the outer Q, 1 in the median Q and 4 in the inner Q).
PS SN were thus pN+ in 6/77 (7.8% of the series but 6 of the 13 pN+ patients) and the sole pN+ SN in 3/77 (4%). Overall, 2 of the 15 with lesion in the outer Q (1 of the 3 pN+), 1 of the 12 median Q (1 of the 2 pN+) and 4 of the 50 inner Q (4 of the 8 pN+) had pN+ PS SN
Conclusions. Due to the pN+ prognostic implications, PSSN biopsy is thus recommended in all patients where after IP injection only PSSN are visualised. In other cases, it is proposed for the lesions in inner or mid quadrants.

Session VI: Surgical Treatment of Lymphatic Diseases

S VI - 1

TECHNIQUES AND LONG TERM OUTCOME OF LYMPHATIC MICROSURGICAL OPERATIONS

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Aim. One of the main problems of microsurgery for lymphedema consists of the discrepancy between the excellent technical possibilities and the subsequently insufficient reduction of the lymphoedematous tissue fibrosis and sclerosis. Appropriate treatment based on pathologic study and surgical outcome have not been adequately documented.

Methods. Over the past 25 years, more than 1000 patients with peripheral lymphedema have been treated with microsurgical techniques. Derivative lymphatic micro-vascular procedures has today its most exemplary application in multiple lymphatic-venous anastomoses (LVA). For those cases where a venous disease is associated to more or less latent or manifest lymphostatic pathology of such severity to contraindicate a lymphatic-venous shunt, reconstructive lymphatic microsurgery techniques have been developed (autologous venous grafts or lymphatic-venous-lymphatic-plasty - LVLA). Objective assessment was undertaken by water volumetry and lymphoscintigraphy.

Outcome. Subjective improvement was noted in 87% of patients. Objectively, volume changes showed a significant improvement in 83%, with an average reduction of 67% of the excess volume. Of those patients followed-up, 85% have been able to discontinue the use of conservative measures, with an average follow-up of more than 7 years and average reduction in excess volume of 69%. There was a 87% reduction in the incidence of cellulitis after microsurgery.

Conclusions. Microsurgical lymphatic-venous anastomoses have a place in the treatment of peripheral lymphedema and should be the therapy of choice in patients who are not sufficiently responsive to nonsurgical treatment. Improved results can be expected with operations performed earlier at the very first stages of lymphedema.

S VI - 2

MICROSURGICAL LYMPHOVENOUS SHUNTS AFTER 40 YEARS- INDICATIONS, TECHNIQUES AND FOLLOW-UP EVALUATION METHODS

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Over the last 40 above 1000 microsurgical lympho-venous shunts have been performed in our center in patients with lymphedema of lower limbs. The follow-up has been from 5 to 40 years. The indications for shunts were: postsurgical (after hysterectomy), postinflammatory, hyperplastic and idiopathic lymphedema. The 5-year follow-up results were dependent on the type of lymphedema. They were in postsurgical group 80% (in the survivals), 40-50% in postinflammatory, above 80% in hyperplastic, and 5-10% in the idiopathic group. Main problems: (i) establishing proper indications, (ii) postoperative evaluation of shunt patency, (iii) etiology of shunt obliteration, (iv) discrimination of effectiveness of shunts from elastic support, massage and antibiotic therapy effects. Basing on personal experience our present policy is as follows: (i) indications: lymphoscintigraphy of superficial and deep systems delineating at least one lymphatic and fragment of inguinal lymph node within 3h in all patients with obstructive edema, fast growing edema after hysterectomy or groin dissection not controlled by elastic support, hyperplastic lymphedema in children and teenagers, decompression of thigh lymph stasis before lower leg debulking.(ii) contraindications: lack of even rudimentary lymphatics on lymphoscintigraphy, inflammatory changes in skin and lymphatics, idiopathic lymphedema (previously hypoplastic, precox and tarda), (iii) immediate postoperative low molecular heparin for 6 weeks, long-lasting penicillin for one year and longer, elastic stockings, intensive walking and muscular exercises, foot hygiene (iv) postoperative evaluation: lymphoscintigraphy with liver scanning (time of appearance of tracer in blood circulation), measurement of tissue fluid pressure in standardized conditions, subsidence of DLA attacks, lack of increase of circumference or volume. Combined microsurgery, long-lasting penicillin and elastic support with intensive muscular exercise seem to have stopped progression of lymphedema in the majority of our patients.

S VI - 3

CLINICAL AND THERAPEUTICAL STRATEGIES IN LYMPHATIC DISEASE MANAGEMENT IN PEDIATRICS

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Lymphatic disease in pediatrics could be congenital – malformations in general; acquired trauma (accidents, iatropathology, tumoral and infectious – bacterial, viral or parasites). Malformation (beside infections) are the most frequent, according to our classification (LAD I, II, LAAD). Primary Lymphedema (1° L) (90% +/- of Lymphedemas of the first 10 year of age). Lymphangiomas /Lymphangiomatosis – including some types of exudative enteropathy, and with low frequency, chylos collections, internal and external fistulae. Infections: adenitis, erisipela, lymphangitis and parasitosis (filarial diseases in the first place- mansonella Orsani) and viral (Eg. Fever of cats scratch) and specific agent: Eg. TBC, Brucellosis 1° L is a syndrome – segmentary or systemic. More then 15 anatomo – pathological causes are the common denominator in more then 17 genetical syndromes and more then 47 disease. Lymphoscintigrapy, bone measure; in general phlebograpy and in all cases a minimal invasive surgical biopsy and/or as first step for a lymph venous shunt. A genetical study is mandatory, molecular biology is present for the future – but in general, not possible. CPT is mandatory as the first step in treatment. In segmentary compromise-for diagnosis and treatment-in 2 L necessary. After that, elastic bandages and supports-not so easy in pediatrics and tropical areas. Type of lymph-venous shunts is a question of methodology and experience. Lymphangiomas needs for diagnosis: Tomography and/or MRI with contrast media; surgical approach is , if possible, the first step in treatment. The same indications for Lymphangiomatosis-with limits because of extension. Sclerotherapy, Radiofrequency is today an alternative, together with Lymphangiogenic or inhibitor drugs – necessary in difficult aspects of surgery. Imput of chyle in cavities without previous trauma is a consequence of LAAD – Medium chain triglyceride (Eg. Portagen); Octreotide or Desmopressin, some times with CPT; Lymphoscintigrapy, Lymphograpy, direct X Ray, bone scintigrapy, and at last if possible or necessary, surgery: correction or malformations of valves/shunts – (not available for young children). External fistulae are surgical in different ways; infections needs specific protocolles – necessary to renew time to time. Eg. TBC, Erisipela, Filariasis.

S VI - 4

THE THEORY AND PRACTICE OF PLASTIC SURGERY TREATMENT FOR LYMPHEDEMA PATIENTS

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Liposuction of arm lymphedema: A well-established method giving complete reduction with long-lasting result – 10 years follow-up

Introduction. Breast cancer is the most common disease in women, and up to 38% develop lymphedema of the arm following mastectomy, standard axillary node dissection and postoperative irradiation. Limb reductions have been reported utilizing various conservative therapies such as manual lymph and pressure therapy. Patients with long-standing pronounced non-pitting lymphedema do not respond to conservative treatment because the slow or absent lymph flow causes the formation of excess subcutaneous adipose tissue. Previous surgical regimes utilizing either total excision with skin grafting or reduction plasty seldom achieved acceptable cosmetic and functional results. Microsurgical reconstruction involving lympho-venous shunts or transplantation of lymph vessels has also been investigated. Although attractive in concept it does not to provide complete reduction in chronic non-pitting lymphedema due to the persistence of newly formed subcutaneous adipose tissue is not removed.

Patients and methods. 81 women with a mean age of 64 years (41-89) and a mean duration of arm swelling of 9 years (1-37) underwent liposuction due to non-pitting lymphedema. Mean age at breast cancer operation and mean interval between breast cancer operation and liposuction were 52 years (34-79) and 12 years (1-43) respectively. The total volume of aspirate was measured. Pre- and postoperative arm volumes were recorded. The decrease in the edema volume was also calculated both as a percentage of the preoperative edema volume, as well as a ratio between the volumes of the edematous and healthy arms.

Results. Aspirate mean volume was 1980 ml (845-3850). Preoperative mean edema volume was 1750 ml (570-3195). Postoperative mean reduction values were 95% at 3 months (n=81), 101 % at 6 months (n=80), 107% at 1 year (n=78), 110% at 2 years (n=75), 110% at 3 years (n=71), 111% at 4 years (n=60), 111% at 5 years (n=60), 113% at 6 years (n=37), 117% at 7 years (n=24), 115% at 8 years (n=22), 120% at 9 years (n=8), and 117% at 10 years, 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 at 6 months, and below 1 up to 9 years postoperatively.

Conclusions. These long-term results demonstrate that liposuction is a well-established method for treatment of chronic non-pitting arm lymphedema in patients who have failed conservative treatment due to adipose tissue hypertrophy. The removal of hypertrophied adipose tissue, induced by the slow or absent lymph flow, is a prerequisite to achieve complete reduction. The new equilibrium is maintained through constant (24-hour) use of compression garments postoperatively.

S VI - 5

THE FOLLOW-UP PF PATIENTS AFTER RESCONSTRUCTIVE LYMPHATIC MICROSURGERY BY LYMPHOSCINTOGRAPHIC MEASUREMENT

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Lymphscintigraphy is the method of choice to measure the lymphatic outflow in an extremity. Because of the low invasivity and the possibility of repeated measurements it is an ideal method to prove the efficacy of therapeutic procedures in lymphology.
Lymphatic grafting reconstructs a locally destructed lymphatic system, e.g. after surgical interventions in the axilla , the pelvis or the inguinal region.It uses the patients own lymphatic vessels as transplants to bridge the defect. Therefore a longlasting and good functioning effect is expected. This effect therefore should also be measured using the method of lymphoscintigraphy, expressed by the socalled lymphatic transportindex.
With this method it could be shown that also in the long run in patients with a minimal follow up of more than 7 years the lymphatic transportindex was significantly improved. The improvement was especially great in these patients where the grafts could be visualised. Some of the patients improved even to normal values.
Furthermore the transportindex and the changes of the extremity volumes showed a similar behaviour.
Using the lymphscintigraphy the effects of the reconstructive lymphatic microsurgery can be measured and objectivied.

S VI - 6

SURGICAL PROCEDURES IN VERY ADVANCED LYMPHEDEMA OF LOWER LIMBS

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Very advanced stage IV lymphedema cases are not common in the Western hemisphere. They account for less than 1 percent of all lymphedema patients. However, they are quite frequent in the Asian and African countries. The morphological changes include: 1. Hyperkeratosis and fibrosis of skin, 2. Fibrosis of subcutis, 3. Lack of lymphatic channels with formation of numerous tissue fluid lakes, 4. Growth of fat tissue, 5. Very limited capillary filtration with total stop for immune cell extavasation, 6. Tissue fluid subepidermal blisters with leakage, 7. Superficial skin ulcer, 8. Bacterial colonization of deep tissues, 9. Doubling or tripling limb weight with destruction of hip and knee joint, 10. Frequent episodes of limb-origin septicemia. The number of advanced cases is estimated at a level of 10-15 million. The historical surgical procedures comprised total denuding of limb down to fascia and covering with epidermal grafts. The results were unsatisfactory because of acute infections of non-removed foot skin, epidermal ulcerations and plasma leakage from the uncovered surfaces. The contemporary knowledge of type and localization of infection as well as visualization of lymphatic pathways allowed to redesign the surgical procedures. The contemporary protocol includes: 1. Antibiotic preparation (ciprofloxacin 1.0 g daily for 3 months, 2. Daily disinfection of skin with antimicrobial soap containing phenol or similar chemical for 14 days before operation, 3. Two-week limb elevation in bed, 4. Surgery divided into 3 stages: a. removal of fibrotic inguinal lymph nodes and vessels, b. 3-4 weeks later surgical excision of fibrotic lymphatics down to knee level together with the neighboring fibrous infected tissues, c. debulking of calf and dorsum of foot in a bloodless limb (arterial tourniquet) and covering with pedunculated skin flaps, 4. bed -confined limb elevation and continuation of 0.5 g cipro for another month, 5. elastic support (pressure grade III). This modified approach can save limbs otherwise qualified for amputation when the stage of destruction of joints and frequent life-endangering septicemias is reached. The practitioners should possess the knowledge of this type of surgical procedure not to qualify limbs for amputation.

S VI - 7

SUPERFICIAL VENOUS DYSPLASIAS OF THE LOWER LIMBS AND RELATION WITH LYMPHATIC DYSPLASIAS

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Superficial venous malformations of the lower limbs are capillary, extratruncular and truncular dysplasias, according to Hamburg classification. A typical and common venous superficial truncular malformation is the persistence of embryonal vein or of the marginal vein, which is a abnormal not valvulated vein, sited on the lateral side of the limb. Treatment are mainly surgical. Analyzing our cases we discovered a connected dysplasia of the lymphatic superficial system. The knowledge of this anomaly is useful to avoid damages during surgery of the marginal vein.

S VI - 8

LIPOSUCTION IN UPPER LIMB LYMPHOEDEMA

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Introduction and Purpose. Chronic lymphoedema can be a debilitating condition, due to the increased size and weight of the limb. Whilst non-surgical treatments can address the fluid excess they do not alleviate the additional adipose tissue present. Surgical excision can result in an aesthetically unacceptable outcome with extensive scarring. Liposuction and immediate compression has been described for the condition but is not widely available in the UK. We would like to present our initial experience with the technique and early results.

Method. We performed liposuction more than thee months ago on a patient with chronic lymphoedema secondary to axillary lymphadenectomy following breast cancer. Limb volumes, HADS and EQ-5D scores have been recorded prospectively.

Results. Preoperative volume excess was 1120mls. She has maintained significant improvement in limb volume. Her general well-being has improved.

Conclusion. Our patient is delighted with the reduction in limb weight, with improved psychological and social well-being. Our initial result is encouraging and shows that results can be reproduced in different units. We will continue to develop our service.

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Session VII: Medical and Physical Management of Lymphedema

S VII - 1

PHYSICAL TREATMENT OF EDEMA: PROGRESS AND PERSPECTIVES

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"Progress"

A consensus concerning the physical treatment of edema was proposed in 95 by the "Executive committee" of I.S.L. and rediscussed in 98 during a meeting initiated by the American Cancer Society (A.C.S).
During this meeting the use of sequential intermittent pressotherapy was more and more accepted by number of participants on basis of scientific investigation.
If we summarise the physical part of the consensus:
MLD increases very efficiently the macro-molecules resorption and is less resorbing the fluid part of the edema. In other words, the tone or the hardness of the edema is well decreased but the volume of the edema is "not modified"...
Very important is the fact that MLD is also opening substitutive pathways.This collateral network is participating to the edema evacuation when the normal pathways are underbroken and more specifically after nodes removal during cancer surgery.
The multilayers bandages maintaioned, the all day long, all around the edema, are facilitating the macromolecules resorption as much as the fluid evacuation, when the patient is still active.

Conclusion. the physical treatment of the edema is very efficient and the best results are obtained when the edema is treated rapidly after onset.
When the edema is late treated the decrease of volume is less evident and the complete restauration of the initial volume of the limb is rarely obtained.

"Perspectives"

When the patient is late treated and when the volume of the edema is not modified enough during the physical teatment, some clinical signs are step by step becomming more and more evident: ther is no more pitting, no decrease of volume in elevation, and Stemmer-Kaposi sign is still existing.
The quality of the edema is modified: he is becomming more and more "fibrotic" and "tissular"...
We have studied the evolution of the components of the edema and also the problems we can have during the treatment in function with these quality modifications.

S VII - 2

GUIDELINES IN COMPARISON IN THE MANAGEMENT OF PATIENT WITH MASTECTOMY

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Comparing guidelines about treatment of patient with mastectomy allows physicians to provide the best information and recommendations when making decisions about the management of lymphoedema secondary to breast cancer.
The systematic review of literature, however, is limited by the lack of prospective randomized trials evaluating different treatment options:[1] management of lymphoedema in breast cancer patients is based primarily on results from case studies, clinical experience and anecdotal information, so that the natural history and most effective therapies are still poorly understood.
The incidence of lymphoedema has been cited at between 5%-38%, depending on treatment combinations.[2,3,4,5]
It is recommended that all patients undergoing surgery and/or radiotherapy treatment to the axilla receive pre-treatment information on lymphoedema (reccomendation grade B).[6]
There is evidence that lymphoedema should be treated at the first sign of swelling, when management will be more effective (Evidence level III).[6]
Pre- and postoperative measurements of both arms are useful in the assessment and diagnosis of lymphoedema. Circumferential measurements should be taken at 4 points: the metacarpal-phalangeal joints, the wrists, 10 cm distal to the lateral epicondyles and 15 cm proximal to the lateral epicondyles.[1] A difference of greater than 2.0 cm at any of the 4 measurement points may warrant treatment of the lymphoedema, provided that tumour involvement of the axilla or brachial plexus, infection and axillary vein thrombosis have been ruled out.[1] Before any type of lymphoedema treatment is started, in fact, tumour involvement of the axilla or brachial plexus, infection and axillary vein thrombosis should be looked for and treated if present.
Patients who develop lymphoedema should be offered prompt assessment and therapy provided by a multidisciplinary team (reccomendation grade B).[6,14]
Although there is currently no cure for lymphoedema, it is possible to reduce the size of the arm. The most effective management and maintenance comprises multimodal physical therapy (skin care, external support, exercise, massage) and education.[7]
Practitioners should encourage long-term and consistent use of compression garments by women with lymphedema[1] *(Evidence level II).*
Graded compression garments that deliver pressures of 20 to 60 mmHg are the mainstay of lymphoedema therapy and can be used as primary therapy.[8] Some clinicians recommend the use of a compression garment for up to 24 hours per day, while others recommend its use only during walking hours or exercise.[9] One randomized trial has demonstrated a trend in favour of pneumatic compression

(to be continue)

pumps compared with no treatment[1] *(Evidence level II)*. Pump therapy is contraindicated in the presence of active infection or deep vein thrombosis in the limb.
Complex physical therapy, also called complex decongestive physiotherapy, requires further evaluation in randomized trials. In one randomized trial no difference in outcomes was detected between compression garments plus manual lymph drainage versus compression garments alone[10] *(Evidence level I)*.
Other physical therapy modalities, such as laser treatment, electrical stimulation, transcutaneous electrical nerve stimulation (TENS), cryotherapy, microwave therapy and thermal therapy, have been used for lymphoedema in breast cancer patients *(evidence level V)*. However, these modalities need further, rigorous evaluation before recommendations can be made.[1]
Pain and discomfort associated with lymphoedema are common[11] and should be managed primarily by controlling the lymphoedema. Refractory pain can be managed with non-narcotic and narcotic analgesics, with the use of adjuvant analgesics (e.g., tricyclic antidepressants, corticosteroids, anticonvulsants or local anesthetics) when necessary. Aggravating conditions, such as infection and recurrence of cancer in the axillary lymph nodes or brachial plexus, should be looked for and treated.
Because of the psychological morbidity associated with lymphoedema, psychosocial issues should be promptly recognized and addressed. Women with lymphoedema have been shown to have greater psychiatric morbidity and greater functional disability.[12]
Surgery (e.g., microsurgical lymphovenous anastomoses, creation of a myocutaneous flap with latissimus dorsi muscle, omental transposition, grafting of lymphatic vessels with tubes or threads) has produced disappointing, inconsistent results and should be avoided.[1] Diuretics, which have been recommended in the past, may temporarily mobilize water, but the increased interstitial oncotic pressure exerted by the high protein concentration of lymph fluid will cause rapid recurrence of edema.[13] The diuretic effect in the rest of the body may cause adverse side effects, such as hypotension, dehydration and electrolyte imbalance.
Benzopyrones were promoted for use in lymphedema because they were felt to stimulate macrophage-induced proteolysis. Subsequently, a large randomized, placebo-controlled trial of coumarin, a benzopyrone, in 140 women failed to show any benefit *(Evidence level I)*.[1] These products are no longer recommended.
Lymphoedema is not the only complication in management of patients with mastectomy. Women should be warned of the risks of reduction of arm mobility following surgery and/or radiotherapy. They require advice and help with an appropriate programme of exercises (reccomendation grade B).[6] Women undergoing breast and/or axillary surgery need shoulder exercises to enable them to recover a full range of arm and shoulder mobility *(Evidence level III)*.[6]

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S VII - 3

A.N.D.O.S. (NATIONAL ASSOCIATION OF BREAST OPERATED WOMEN) AND THE OPERATED WOMEN'S PROBLEMS

DEGRASSI FLORI
National Coordinator

ANDOS has dedicated its activity since 1976 to substain through physical and psychological rehabilitation women who have undergone an operation for breast cancer, women who address themselves to the Association after the operation, women who choose their own ways among the different possibilities offered by ANDOS.
When we started our activity, nobody took care of rehabilitating physically the operated women, because of the great effort to treat a chronic lymphedema.
But the ANDOS's main purpose is not to effect lymph drainage or press-therapy, the bodily treatment is a way which let us to establish a contact with operated women and convince them to take care of themselves after an operation for breast cancer which can have bad influences on their female, motherly and sexual spheres.
After the operation the woman sees her body in a different way, she doesn't touch herself, she gives importance to her exterior aspect, she doesn't take care of herself or, on the contrary, she becomes hypochondriac which always represents a series of symptoms which means: "I take care of myself" and the justification of it is: "I am ill that's why I take care of myself."
Coming to the Association means the opportunity to receive attention from the world (from the nurse, the association and the husband who knows she needs treatments).
Supported by the Association, she begins to undertand the value of her body again, of her functionality, of her weakness and fragility, but as well as of her strength too.
To obtain a total rehabilitation, ANDOS used physical exercises, swimming and dragon-boat (the only operated women's team to be entered the Italian Federation).
We can end saying that treating lymphedema in its physiological aspects becomes a device to face many other problems.

S VII - 4

THE SOUND WAVE LIMPHATIC DRAINAGE

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The sound wave lymphatic drainage is based on a molecule activation, which includes protein particles and takes place in accordance with the physical process of sound resonance.
Biophysical studies consider that the behaviour of amino acids or the behaviour of a macromolecule is comparable to an oscillatory system, in fact it is provided with a proper oscillation frequency.
In accordance with the bioresonance principle, every time the oscillatory system is subjected to recurrent impulses, which in Flowave are represented by sound waves, (with the same or almost the same frequency as the proper one), the system is going to oscillate with an increasing amplitude and it is going to develop the energy of the amino acid and/or the protein.
As a result of this, it is going to move towards the lymphatic vessels and/or towards the venous vessels.
FLOWAVE is a source of sound wave fields which, guided throughout the biological structures by a compensated two-phases electrical carrier, are able to activate molecules, on the basis of the physic principle of the "sounding resonance" and to migrate them along the physiologic ways, following the "inferior resistance" principle.
In order to verify the functionality of Flowave on the oedema, we prepared a standard protocol and tested it on 50 patients with primitive and secondary lymphoedema (2° and 4° phase).
The lymphoedema had set in for at least 2 months and the patients hadn't been treated for at least 6 months.
The clinical evaluation of the treatment efficacy made use of both the measurement in centimetres of the oedematous limb compared to the healthy one, and the lymphoscintigraphic evaluation on every patient before and after 10 treatments with Flowave.
We got flattering results for both the protocol efficacy interacting with the oedema, and the capacity of the stimulated lymphatic system which was able to maintain, for a while, the activation received from Flowave.

S VII - 5

REHABILITATIVE PLAN IN OUT-PATIENT WITH LYMPHEDEMA GOAL AND OUTCOME IN SHORT AND LONG TERM PROGRAMS. OUR EXPERIENCE

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Aim of this comunication is the presentation of the rehabilitative plan that we have been proposing in our Center to the patients with lymphedema.
Lymphedema is a clinical chronic condition with a progressive evolution to a relevant and permanent disability.
Disability is a concept developed in 1980 with ICDIH-I by the WHO (World Health Organization). This classification, now updated, focused on the disease, and the derived anatomical-functional impairment causing disability and, subsequently, handicap.
After 22 years from the first report of the WHO, it has been presented the ICF(International Classification of Functioning).
Heart of this classification is MAN, his health conditions and his activities. All the aspects here presented are in relation one another, and the environmental and personal factors take on great importance. With the ICF, the interest is put on man as a person, not as a carrier of disease.
It's fundamental for the patients affected by lymphedema: a continuous and total care by rehabilitative team whose task is to formulate a rehabilitative plan.
In our Center, starting from the manual lymphatic drainage and follow throught combined decongestive manual therapy and the global therapeutic approach, five years ago we proposed a rehabilitative plan to the patients with lymphedema.
A project of rehabilitation for these individuals should be personal and personalized, well appropriated and continually updated with short, medium and long-term programs.
The object of the rehabilitative plan is to reduce and contain disability encouraging functional abilities and social participation.
I have revised the clinical data of all the patients with lymphedema for whom I had formulated a rehabilitative project in the last four years. I have included only the patients with primary lymphedema and oncological secondary lymphedema. This analysis is based on 200 patients.
Unfortunately the 70 percent of these patiets were treated in advanced stage.
The conclusions of our experience are that in my Center, until 4 years ago, patients with lymphedema were treated only with MLD or with other monotherapies but today we can say that MLD alone and all the other therapies alone do not represent neither the cure of disease nor of the man. The combined decongestive manual therapy is a good therapy of oedema but not always for the man.On the other hand the so called total therapeutic approach can't be done following strict and impersonal therapeutic protocols. To treat both the disease and the man it is necessary a personal and individual rehabilitative plan.

S VII - 6

COMPLEX DECONGESTIVE PHYSICAL THERAPY (C.D.P.T.): ROLE OF MANUAL LYMPHATIC DRAINAGE

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The authors have been treating lymphoede-ma of the extremities conservatively for years. The data on manual lymphatic draina-ge confirm the importance of this physiotherapeutic technique which, if correctly performed, is capable of acting positively not only lymphatic circulation but also on certain parameters of the microcirculation, increasing the extent and rate of flow. After analysing the action mechanisms of the technique, various types of physical and medical interventions are presented which, as part of a programme of integrated therapy, have proved their usefulness over time for the reduction and control of lymphoedema.

Session VIII: Poster

S VIII - 1

FIBROSIS AS A RESULT OF LYMPHATIC DRAINAGE IMPAIRMENT AND ITS AFFECTION BY PROTEASES

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Progressive interstitial fibrosis is one of the late complications of lymphatic drainage impairment. Although pathophysiological relations between chronic lymphedema and fibrosis are not known, involvement of chronic inflammation in the interstitium as well as TGF-beta and interleukin IL-8 cytokine overproduction has been assumed. Mainly TGF-beta overproduction leads to extracellular matrix stimulation, fibroblast proliferation and adhesion molecules expression. IL-8 stimulates fibroblast proliferation and collagen synthesis.
Orally administered proteinases showing a systemic effect are capable to effectively reduce activity of macrophages and expression of adhesion molecules on the cell surface. Moreover, they also show a significant fibrinolytic and antiedematous effects. Clearance of immune complexes also plays an important role in soft tissue chronic inflammation. From lymphatic drainage pathophysiology point of view, increasing of interstitial space permeability described in the 60's of 20th century may be seen as a crucial effect.
There is a strong evidence showing a positive effect of orally administered proteinases on lymphedema and impaired lymphatic drainage as well as on pathological fibro-productive processes in various organs.
The authors demonstrate on few cases a significant clinical effect of proteinases in patients with primary lymphedema. Marked reduction of fibrotic changes, complete inhibition of lymphorea and a fast healing of circular crural defects are considered the most important effects of the treatment.

S VIII - 2

NURSING IN LYMPHEDEMA PATIENTS

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The Nurse recognize health like a fundamental right of a person and an interest of the community; he devotes himself to protect this right with preventive and rehabilitative activities; moreover nursing doesn't stop or begins in the necessity of a technical support, but it concerns also health education toward the patient.
Nursing interventions begin before the rising up of pathology, trying a prevention, or if a pathology is in progress, a prevention of complications(?).
Nurse does not limit his intervention to a clinical structure but he spread them also on the territorial field; so affording the situation of a patient with lymphatic problems, he can single out specific signs and symptoms, and direct him to the appropriate specialist, make a follow up, give information, recommend this person along the itinerary of diagnosis and therapy.
Instead if the patient is recovered(?) in a hospital, with lymphatic pathology, the nurse has to be able to single out signs and symptoms of eventual complications(?) and where is possible to prevent them.
Is very important to start immediately a nursing process integrated with a problem solving activity that can produce documents that are useful to the check and the improvement of interventions, all this items must be accompanied with technical, scientific and, overall, human know how.
Nursing preventive intervention is comprehensive of three levels that work on the three plans of holistic health paradigm: biological, psychological and social plan.
The nurse with these instruments can manage the situation of a patient trough the identification of all expressed and unexpressed needs and the individualization of nursing activities, he is able to use existent resources, also working inside an equipe, with the maximal effectiveness.
He has to be able in conducting a nursing assessment and extracting an appropriate nursing diagnoses, intervening with application of bandages and powders to prevent edema(?), teaching specific exercises, and in order of operate in holistic way he has to introduce an empathic relationship with the patient and his relatives.
The main objective is the health of the patient and the maximal enhancement of residual functionality, physical, psychological, and of communication abilities; this is possible working in a rehabilitative way looking for a gradual evolution.
The nurse will develop a strategy that will operate in a first time in a substitutive way changing progressively toward a minor dependence for daily life activities.

S VIII - 3

OPTIONAL CIRCULATORY AND COMPELLING CIRCULATORY LYMPH LOAD

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The CCLL is transported diluted into a water solution: Optional Circulatory Lymph Load. During the transport the proteins and fats are concentrated up to 1/2 their plasma concentration. This way, 1/10 of tissue filtered blood liquid is brought back through the lymph, meaning a 0, 5 ml of lymph production for each 1000 ml of blood going through a tissue.
Protein determination was done by Bioret-photometry, expressed in g/dl; fat concentration was determined using the following formula: 2, 25 X Total Cholesterol + 90 (constant factor).
Usually protein and fat concentration in the lymph is done at the same rate (the difference in the end results are the consequence of the connexion with mesenteric lymph capillaries witch carry a large amount on fats). This process is done by gradually reducing the water and crystalloids into the lymph.
In some pathological situations (swelling, venous hypertension) the lymph flow can increase either as a consequence of coloid-osmothic pressure increase (swelling) or as a consequence of interstitial volume increase (venous hypertension).
The research focused on evaluation of Optional Circulatory Lymph Load in local edemas (general origins edemas witch have only theoretical lymphatic origin).
Lymph flows from interstitial tissues through lymph capillaries, than through collecting lymph capillaries, sinusoid lymph-nodes capillaries, lymph vessels, and in the end all the lymph is downloaded into the veins at the base of the neck. During this journey the lymph is processed: the macromolecules (proteins and fat) are concentrated. Those macromolecules represent the Compelling Circulatory Lymph Load.
There were conducted 2 separate trials: First, from 9 swains (35-40 kg), interstitial fluid, and lymph was harvested from pre- and post-sinusoidal lymph-node capillaries, from the mesenteric lymph vessels, and from ducts thoracic. Second, from patients with edema due to acute trombophlebitis, (12 cases), Postthrombotic syndrome (19 cases), and with lymph edema (53 cases), interstitial fluid, was harvested.
On the swains the macromolecules concentration varied as follows: from the peripheral tissues to ducts thoracic, protein concentration was enhanced from 1/10 to 1/2 plasma value; fat concentration was enhanced from 1/10 to 2/1 plasma value, from the mesenteric lymph vessels to ducts thoracic, fat concentration was decreased from 4/1 to 2/1 plasma value. (In the post prandial period).
Comments. The term of Compelling Circulatory Lymph Load can ease the understanding of the physiology of lymph circulation and the physiopathology of lymph edema and phlebedema. It can also contribute to simplify the rather complicated classification of etiology and pathology of Lymphatic Insufficiency.

S VIII - 4

THE EDUCATION END INFORMATION OF PATIENTS TROUGH THE EXPERIENCE OF THE LYMPHOLOGY GROUP OF ASL 4 TERNI

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In the ASL 4 Lymphology service in Terni the prevention of primary and secondary post mastectomy lymphedema in patients has been given the utmost importance. After a working experience of 4 years, with groups consisting of 6 patients followed by 2 therapists who illustrated the simple anatomical – physiological notions of the lymphatic system, combined hygiene – behavioural and self- care rules, we realised the difficulties in achieving the objectives prefixed. We noticed, above all, the lack of privacy as well as learning difficulties during the execution manoeuvres of combined self- care, on the other hand there was great attention and participation. regarding the theoretical part. We therefore established the necessity to separate the two moments. For the past six months, in fact, combined self-care has been carried out in one-on-one sittings (patient and physiotherapist) and in group sittings for the illustration of anatomical-physiology and hygiene-behavioural rules. The figure of the psychologist has been introduced into the group in order to cope with the psychological aspects of the pathology which often invalidate the clinical results obtained with the combined intensive therapy. This intends to be an INFORMATION group and not a THERAPEUTICAL one, even if the psychologist, where necessary, will invite the patients to take part in individual sittings. The group begins with the psychologist's introduction to the objectives and end-points of the sitting, the two physiotherapists explain elementary notions concerning anatomical- physiological aspects of the lymphatic circulation, and through the visualisation of a poster containing photos and captions, illustrating hygienic- behavioural rules and the eventual operative strategies to follow. This is followed by eventual questions concerning the patients lives and is carefully piloted by the psychologist. In the second and final sitting (after about 15 days) the patients fill in a questionnaire that highlights the functional and psychological problems they face in their every day life and the psychologist invites the patients to reflect on some "key words" like REHABILITATION, WELFARE, and the dialogue opens according to the patients' remarks. The groups should lack homogeneity as for as the surgery date is concerned, above all the most-recently operated ones because they react positively to the exchange with whom, on the other hand, has more experience, and they are therefore encouraged to show their ability to react to the event. The exchange of the experiences, however , represents an enormous enrichment for everyone involved. We have noticed how important it is to have female technical staff (psychologist and physiotherapists) because the difficulties that patients live are represented by the alteration to their image which influences their moods, their family and social behaviour. This experience has been particularly useful because it offered women the occasion to gather more information concerning the pathology and to compare their own experiences with those of others who had lived similar ones. In perspective, thanks to the work effectuated, the group will be expanded to up to 10 patients who will be followed for a higher number of sittings. So far, in 6 months, 6 groups have been involved, for a total of 36 patients.

S VIII - 5

THE COMPLEX DECONGESTIVE THERAPY OF ELEPHANTIASIS (CASE REPORT)

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The elephantiasis represents a serious health and social problem.
40-years old female was admitted with history of 20 years worsening lymphoedema of one lower limb. The benign iatrogenic lymphoedema was developed after the operation of inguinal hernia. The lymphoedema worsened due to pregnancy, recurrent erysipelas and especially due to inadequate and non-complex therapy.
The blocation of lymph flow in the inguinal area during the lymphoscintigrafic investigation was confirmed, the lymph flow was not decreased. After examination of our patient the proper and consistent complex decongestive therapy of developed elephantiasis was started. Manual lymph drainage, multilayer compression and special exercises was done daily for 4 weeks and then the continuing home therapy was established. The intensive 4 weeks therapy was repeated after 3 months. The prevention of erysipelas was an indivisible part of the therapy. During 6 months therapy the reduction of lymphoedema was significant (i.e. 40 cm in leg diameter). The mobility and the quality of life of our patient was significant improved.
Conclusions. The proper and daily management of lymphoedema is a problem in its therapy. On the other hand the inadequate therapy could lead to invalidity of some patients.

S VIII - 6

IMMUNOHISTOPATHOLOGY OF HUMAN LEG SKIN AND LYMPHATICS IN LYMPHEDEMA

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Recent progress in immunohistopathology and development of new biological markers of lymphatic endothelium allow to assess the morphological and functional status of human limb skin and lymphatics. We studied normal skin and collecting lymphatics of lower legs in healthy non-lymphedema subjects and in obstructive lymphedema patients. Aim. To investigate lymphatic endothelium in skin superficial and deep system and collecting trunks in lower legs. Material. Skin fragments and superficial lymphatics were harvested from 10 patients with obstructive lymphedema stage IV of lower limbs undergoing debulking surgery and 6 healthy (ischemic) legs amputated because of irreversible arterial changes. Methods. Immunohistochemical staining of specimens was performed using monoclonal antibodies agains LYVE1, prox1, podoplanin, chemokines CCL19 and CCL21, receptor CCR7, VEGF C and VEGF C R. Results. Control limbs. LYVE1 was detected in small skin lymphatics. In lymphatic trunks staining was very weak. Neither prox1 nor podoplanin were identifiable in skin and collectors. Slight staining for CCL19 and CCL21 was seen both in skin and collecting lymph vessels. No presence of receptor CCR7 was detected. VEGF C and its receptor flt4 were present in skin lymphatics but not in collecting vessels. Lymphedematous skin and collectors. Neither LYVE nor podoplanin and prox 1 could be identified in lymphatic structures. Also there was no chemokine CCL19 and 21 or CCL9. No VEGF C and its receptor were identified in skin and large lymphatics. Conclusions. Normal lymphatics stain very weakly for LYVE1 and contain little of CCL19 and 21 as well as VEGF compared with embryonic vessels. Differentiated lymphatics probably contain less receptors, chemokines and growth factors. In long-lasting lymphedema lymphatic endothelium undergoes major degenerative changes.

S VIII - 7

"COMBINED SELF-MANAGEMENT" WITHIN SELF-CARE IN LYMPHEDEMA PATIENT

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Lymphedema is a chronic, evolutive illness, it can therefore be improved but not completely cured.
The patient should, therefore, be informed, in a simple and clear way, about the pathology and the hygienic rules to follow in order to avoid a worsening of the situation. The patient is taught how to practice easy techniques of "combined self-management", that is: self-drainage ; self-bandaging, under-bandaging gymnastics. During the first examination carried out by the rehabilitative equipe the patient immediately acquires a brochure containing the hygienic-behavioural rules to follow. After this she is placed in a group (5/6 people) in which the operators explain the anatomy and physio-pathology of the lymphatic system and the rules to follow in a simple way. The patient, after being treated individually and after having experienced on her own body both DLM and bandaging carried out by specialists, learns the easy techniques of "combined self-management". From 3 - 6 individual sittings are held. During the first sitting the patient is given a brochure in which the techniques to be taught are illustrated.

SELF-DRAINAGE
Few manoeuvres which respect the DLM sequences. It is begun by stimulating the principal lymph node stations (TERMINUS, AXILLARY, GROIN) ready to receive the lymph coming from the periphery.
This is continued through the stimulation at the watershed, of the alternative courses and finally with the treatment of the limb.

SELF-BANDAGING
It is simplified in both the application and the number of bandages used.

GYMNASTICS UNDER SELF-BANDAGING OR AFTER HAVING APPLIED COMPRESSION STOCKING
The patient carries out a few exercises which stimulate the venous and lymphatic return and the opening of alternative courses.
490 patients have been treated in our Lymphology Department over a period of 4 years. Only 10% have been successfully taught complete "combined self-management"; 70% have been taught self-drainage and under bandaging gymnastics ; 20% were unable to learn anything.
If the patient follows us, in this course he gains consciousness about the illness learning not to consider it so invalidating and also how to maintain a satisfactory quality of life; furthermore the risk of total dependency on the therapeutical equipe is reduced, even if it remains irreplaceable in the treatment of lymphedema.

S VIII - 8

HOW TO AVOID LYMPHEDEMA AFTER FLEBECTOMY?

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Venous surgery is often complicated by the lesion of lymphatic trunks. In some cases we observe lymphnodes at the root of the lower limb very near the venous vessels. During the ligature of saphenous collaterals it's possible to amass lymphatic trunk or to tear the vasal wall. In this cases we observe a fast generation of lymphocel; after one or two days we observe a limb lymphedema. The prognosis, in our experience, is depending from the inguinal lymphnodes; if normal presents there is a good prognosis within 1 – 2 months; if there is a low visualization to the lymphoscintigrafic exam the late prognosis is bad (iatrogenic lymphedema).

S VIII - 9

CHANGEMENT OF BODY IMAGE IN PATIENTS WITH PRIMARY AND SECONDARY LYMPHEDEMA: PSYCHOLOGICAL ASPECTS

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In this study we try to explain our experience during the psychological treatment with vascular patients and in particular patients suffering by Lynphedema.
We all know the importance of the body changement; the body modify with an uncontrolled process one or more parts of itself.
The objective is to understand the psycho-physiological reaction of the patient who have a drastic changement in his body image who is the base of physic and psychological structure.
In order to verify this process we explore the body image of these patients and we compare them with the body image of a control group with the same characteristics; we utilize Body Perception Test and Body Cathexis Questionnaire to investigate the subjective perception (visual and cenestesic) of the districts of the body and the libidic investment about the same districts.
This "work in progress" may demonstrate how the particular form of the body image may give a positive or negative influence in the rehabilitative iter. The most part of patients may develop particular psychopathological traits that depend by individual characteristics.

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S VIII - 10

GORHAM-STOUT SYNDROME: A RARE CASE REPORT

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The Gorham-Stout syndrome is characterized by the association of diffuse osteolitic lesions and lymphangiomatosis.
The lesions of the bone are determined by a proliferation of vascular canals inside the bone and by an increase of osteoclastic cells function.
The syndrome is determined bu a rare (less of 200 cases in the world) genetic dominant autosomic mutation. Still today the gene responsible of the illness is unknown.
The case is regarding a young male 27 years old. Starting from 8 years ago it began a proliferation of lymphangiodispolasias at left thigh level, with fast increase and local pain, retroperitoneal and at spleen level. With MRI was observed diffuse boner lesions (cranium, spinal column, pelvis bone, neck, femoral diafisis and XII rib).
After the surgical resection of the lesion at thigh level, these is a permanent clinical lymphstasis at root of the left lower limb and in the omolateral suprapubic region, demonstrated by high resolution echography.
In these cases it's not well known the prognosis and also the therapy is symptomatic: orthopaedic surgery in case of fractures, radiotherapy and cytostatic drugs to reduce the neovascular proliferation (above all inside the bones),bifosfonates to reduce the reabsorption of the bone. For the lymphatic dyspalsias it's useful in some cases the surgical treatment and in all the cases manual lymphatic drainage and elastocompressure with bandaging and garment.
It's very important to perform to these patients more periodical follow up (medical, orthopaedic and vascular) to check the evolution of the illness.

Session IX: Rehabilitative Treatment of Lymphedema

S IX - 1

COMPRESSION THERAPY IN LYMPHEDEMA

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Compression treatment (CT) is the most important component in the context of "physical decongestion therapy".
Therapy starts with a "decongestion phase" using multi-layer bandages and, for the distal forms of lymphedema, intermittent pneumatic compression. The material which is used depends on the skill and the training of the bandager. We prefer firmly applied inelastic bandages which should be changed as soon they get loose. CT should always be accompanied by exercises and, if available, with manual lymph drainage. When no more reduction of edema can be achieved, we switch over to a "maintenance phase" of treatment, mainly based on made to measure garments. Only few randomised controlled trials demonstrate the clinical efficacy of CT in lymphedema.
Own experiments show that the volume reduction which is achieved can mainly be explained by the over-proportional reduction of tissue fluid and only to a lesser extent by an enhancement of the lymph drainage. This is the main reason for the necessity of a continuous, sustained compression in order to prevent refilling of the tissue with edema.

S IX - 2

HAEMODYNAMICS EFFECTS OF MULTILAYERD BANDAGES DRESSED ON A LOWER LIMB OF PATIENTS WITH HEART FAILURE

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Background and purpose. Manual lymphatic drainage, intermittent pneumatic pressure therapy, multilayered bandages and garments are the main technics of the conservative physical treatment of peripheral lymphoedema (ISL consensus).
We know, since 1988, that intermittent compression therapy applied to both lower limbs is prejudicious for subjects with heart failure because right atrial pressure and pulmonary arterial pressure increase to a critical point.
In the present study, hemodynamics parameters are learned in patients worning a multilayered bandage.
Material and methods. We present a report of 5 cases, 4 men and 1 woman, hospitalized in Coronary Unit with heart failure class III or IV. Patients worn a right atrial catheter and are in a clinical steady state. Multi-layered bandages are applied on one lower limb, patient lying supine, during one hour.experiments. To optimize the effect of the bandages we ask the subject to perform some movements.
Several parameters are recorded, mainly via the Swan-Ganz catheter. Subjects sufferd or not of lower limb edema.
Results. Despite our small population, we could clearly point out some trends : during movements, even of very low intensity, made with multilayered bandages, right atrial pressure and pulmonary arterial pressure are elevated. Increasing is major than after exercises performed without bandages. Stability of heart rate, heart flow, cardiac index and systolic index during the whole study show that subjects failed to give an answer to this venous overflow due to heart failure.
Results lead us to be carrefully when we propose to use the multilayered bandages technique on subjects without any information about his cardiac state.
In case of heart failure, we recommand to don't use multilayered bandages regarding trends of our study. We follow next months our investigations, on a bigger sample, with accurate statistical values, to confirm those preliminary results.

S IX - 3

HOLISTIC APPROACH TO LIMPHEDEMA PATIENT

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Patient suffering from lymphedema presents more clinical aspects to treat. In the last two years we studied 396 patients (age ranging between 0 and 84 years old) affected by lymphedema (175 with primary kind and 221 with secondary one, 235 of the lower limbs and 161 of the upper limbs, 163 unilateral and 233 bilateral).
All the patients underwent the clinical exam, the lymphoscintigraphy of two limbs in comparison (in 47 cases of four limbs), the high resolution echography. In 115 cases we performed them Computering Tomography of two limbs. In all cases we performed proper psychological test to define this aspect of the pathology.
With the combination of the clinical and instrumental exams and in function of clinical stage of the lymphedema, the skin conditions, the side of illness (unilateral or bilateral), of the age of the patient, of the physical ability of patient, of the psychological characteristics, the tissutal consistence, we performed:

- Combined physical therapy (with tailored bandages) in 396 patients;
- Exercises in pool in 34 cases;
- Psychological interview in 234 cases;
- Proper exercises to increase the muscular trophism in 165 cases;
- Articular rehabilitation in 193 cases;
- Respect of particular rules and behaviours to avoid skin and affected tissues complications (the way to take a blood sample, above all in bimastectomized patients, the therapeutical injections, the skin care);
- Secondary prevention above all of phlogistic complications in all cases

In a year follow up we observed:

- Medium decrease of volume in affected limb of 39%;
- Good functional recovery in 94% of cases;
- Phlogistic complications in 3,5% of cases;
- Oedema worsening in 4% of cases

In our experience the therapeutical and monitoring approach to the lymphedema patient must be holistic to obtain best clinical results, to maintain the results, to avoid possible complications.

S IX - 4

RESPONSES TO TREATMENT OF POSTSURGICAL LYMPHEDEMA: EFFECTS OF DELAYS IN RECOGNITION AND BODY MASS INDEX

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Introduction. Refinements of surgical technique and sentinel node procedures have reduced the morbidity of lymph node dissection (LND), but lymphedema still occurs after LND in both upper and lower extremities. This investigation addressed the relationships of response to treatment with Body Mass Index (BMI) and delay to treatment (DTRX) after onset of symptoms. Treatment consisted of series of manual lymph drainage, gradient sequential pump, exercise therapy and sleeve compression.
Objectives.
1. The understanding of relationship of Body Mass Index(BMI) and delay in administration of Lymphedema treatment after onset of symptoms.
2. The greater BMI, the greater asymmetry in circumferential limb difference and the slower response to the Lymphedema treatment.
3. The importance in early diagnosis of postsurgical lymphedema and early treatment.

Methods. Records of 58 patients with post surgical lymphedema of the upper (n=32) and lower (n=26) extremities were reviewed. Severity of symptoms was rated on a scale of 1-10 (most severe). Symptoms and limb circumferences were analyzed before and after treatment with regard to DTRX and BMI.
Results. Spearman rank order correlation coefficients were determined for relationships between severity of symptoms versus DTRX and BMI. Responses to treatment measured by symptom scores and limb circumferences were also compared to DTRX and BMI. Significant relationships (correlations) were identified between severity of lymphedema before treatment and DTRX ($r=0.324$, $p<0.02$) and between objective responses to treatment and DTRX ($r=0.30$, $p<0.03$). Increased BMI was associated with greater asymmetries in limb circumferences both before and after treatment (both $p<0.001$), and also with longer DTRX ($r=0.322$, $p<0.02$). All patients (100%) demonstrated both subjective and objective responses to therapy.
Conclusions. Lymphedema continues to occur after LND. Delays in seeking treatment after onset of symptoms are associated with more severe lymphedema. Patients with increased BMI tend to seek treatment later in the course of their disease, and demonstrate greater asymmetries in limb circumference. Healthcare providers should educate patients who undergo LND to recognize the early symptoms of lymphedema, particularly heavier patients, in order that they seek treatment earlier in the course of the disease.

S IX - 5

TAILORED REHABILITATIVE PROTOCOL IN LYMPHEDEMA PATIENT

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Lymphedema represents a grave, chronic and discomfort pathology; it's difficult to cure and to monitor along the time. Severity functional impotence, change of own appearance, limitation of social and working relations determine a serious obstacle to the rehabilitative approach and to the maintenance of therapeutical protocols.
In spite of these real difficults, it's the task of rehabilitative equipe to improve quality life of the patients suffering from lymphedema through medical, surgical, pharmacological and rehabilitative techniques knowledge (lymphoscintigraphy, CT, laserdoppler, drugs, M.L.D., pressoterapy, elastocompressure, ventilatory and isotonic gymnastic, psicological evaluation).
Lymphedema characteristicts would be taken into consideration: – primary or secondary – localization and stadium and the following important parameters concerning the patients :age sex, social and cultural condition, presence of other pathologies causes of disability. For example the therapeutical target in young subjects will be a quick reintegration in their social life and productive capacity also endowing estetic aspects (a proper muscolar training will be intensified, proposed an adequate, pleasant and comfortable stockings and a proper domiciliary self-therapy). While in elderly subjects the therapeutical target will be the self-sufficient re-establishment in the precincts of the domestic walls and the prevention of other pathologies caused by lymphedema presence (it would be given a particular attention to the orthopaedic aids : special footwear and elastic stockings, to the ventilatory gymnastic, to the soft physical therapy). The common target for all patients is the achievement of the compliance to the rehabilitative protocols to avoid the possibility either of a refusal or a renunciation of the rehabilitative project. We have studied 296 patients – 197 females 99 males – age from 23 to 81 years, who presented primary or secondary limbs lymphedema (lower bilateral in 150 cases, lower monolateral in 35 cases, upper bilateral in 9 and upper monolateral in 102). All patients underwent a clinical examination (limbs circumference – body weight – muscolar exame), lymphoscintigraphy, CT, laserdoppler exame. As the previous parameters described, all patients starded a tailored rehabilitative protocol for 3 months. At the end of treatment all the subjects showed an evidence reduction of limb circumference (between 10%and 30% above all at II and III clinical stage), 215 subjects improved their limbs function, weight, muscolar and psichological performance , 8 patients dropped the treatment; in 73 patients the improvement was less evident(subjects at IV and V clinical stage with neurological or osteoartrophatic pathologies) . It's necessary so to personalize the treatment in function of the patient's needs and of his capacity to interact with the equipe.

S IX - 6

VARIATION OF THE SKIN'S TEMPERATURE UNDER THE MULTI-LAYER BANDAGES DURING 24 H

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The use of heat as a therapeutic carrier for the physical treatment of lymph edema of the limbs was mainly developed in China. It consists of wrapping the affected limb with hot and humid cloths. In Europe, at the end of the eighties, U. Fox † developed the thermo therapy, notably through the realization and use of a microwave oven.
The unfavorable relation between the therapeutic benefit and the secondary effects linked to an increase of temperature which is too high, has taken off this therapeutic approach of the "guidelines".
The lymph oedema is cutaneous and subcutaneous and consists mainly of collagen, fat and water, which is sensitive to variations in temperature in the range of 30 to 40 degrees.
The local increase of the cutaneous and subcutaneous temperature appears, according to some authors, to have a positive effect on the decrease of the volume and the tone of the secondary lymphoedemas of the limbs.
Those patients who benefited of the application of multi-layer bandages in the framework of a physical treatment of the lymphoedema systematically described a sensation of increase of temperature of the bandaged limb.
The efficiency of the multi-layer bandages to obtain a reduction of the volume of the lymph oedema does not require any further demonstration. Nevertheless, the physical and physiological mechanisms, which preside this beneficial effect remain little explored considering the dissemination and use of the multi-layer bandages.
It appeared of interest to us to observe the variation if the cutaneous temperature underneath the multi-layer bandages. Indeed, this elementary physical parameter, although debated by authors in the field of thermo-therapy, has strangely not been the subject of a study in the context of multi-layer bandages, as far as we are aware
We have measured the cutaneous temperature at different points of the left and right upper limbs of a sample of healthy women and of women with secondary lymph oedema of an upper limb.
Thereafter, using the same sample, we have measured the evolution of the cutaneous temperature during 24 hours under the multi-layer bandages.
The measurements were taken with 4 temperature sensors sensitive to 0,1d°C. The values were registered (3740/24H) with a portable data logger fixed on the belt of the person. Three temperature sensors were placed on the skin under the multi-layer bandage and a reference sensor was placed (uncovered) on the healthy arm. The data was then downloaded and analysed on the PC. The communication concerns the discussion of the evolution of these temperatures.

Session X: Modern Strategies in the Management of Lymphedema

S X - 1

LYMPHEDEMA-RELATED ACUTE DERMATITIS: ITS PATHOPHYSIOLOGY AND CLINICAL MANAGEMENT

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The author is going to speak about lymphedema-related acute dermatitis based on the authos's own data. **Terminology.** Erysipelas, lymphangitis and septicemia are different diseases.
Pathophysiology. The following points contradicts a simple bact. infection; 1. There is no or, if any, up to moderate leukocytosis and there is no polymorphs infiltrating in the tissue. 2. There is no difference in necessary days for healing whether systemic antibiotics are given or not. 3.Only the lymphedematous skin is involved.4.A spontaneous healing (noticed by history taking). Skin resident bacteria, mostly staphylococcus epid. and corynebacterium invade into the dermis (tinea helps this process), (genomes of the staph. is proved in the dermis) and induce Th1 dominent immunological reaction (low Po2 pressure helps a strong reaction). Adhesion molecules (ICAM-1, VCAM-1, ELAM-1), interleukin-6, PGE2 are elevated, with Il-6 inducing a high CRP. Identified chemokines explains the infiltrating cells which are mostly T-cells and lack polymorphs. Elevated IFN, NK cell, LAK cell and NO produced by bact. stimulated macrophage are all in favor of killing the invaded bacteria which leads to a spontaneous healing. The edema gets worse after the attack because NO disturbs lymphatic contraction and destroys the tissue. Elevated EGF and bFGF explain elephantiasis, a terminal stage of its recurrent episode.
Treatment. Oral NSAID, external application of steroid ointment and bed rest are the first choice management. However if the complication had been caused by pathogenic bact., systemic antibiotics should be given? (the author has given to only 4 patients and they are all primary lymphedema with multiple recurrent episode).
Prophylaxis. Daily external application of nadifloxacin lotion prevents this attack completely. Tinea well treated and a physiotherapy by magnetic fileds, vibration and hyperthermia which reduces inflammation and increases immunological reaction reduce incidence of this complication.

S X - 2

MANAGEMENT OF LYMPHEDEMA: ECHO-COLOUR-DOPPLER INDICATIONS FOR STRATEGIES

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The diagnosis of lymphoedema is essentially clinical, however we must not ignore the accuracy of high resolution scan and its non-invasive, repeatable and reliable low cost diagnostic approach.
We evaluated the utility of this methodology using Echo-Colour- Doppler Sonoline Antares apparatus in lymphoedematous limbs diagnostics because it is able to give us information on structural characteristics of the examined tissue and above all in therapeutic strategies and monitor therapy. We carried out the exam using adequate high frequency (13.5 MHz) linear electronic probe, directly on the skin without pressure in order to avoid the collapse of superficial lymphatic structures, to optimise the quality of imaging and resolution of cutaneous and subcutaneous structures, through trans-axial and longitudinal scan, and using the same markers in subsequent exams in lateral and medial areas of the limb. Furthermore, we tried to correlate clinical impressions, based upon tissular consistency, and Echo-Colour-Doppler findings by highlighting three different clinical-instrumental pictures with relative prognostic rebounds, which allowed us to direct rehabilitation programs to optimise therapy.

1) lymphoedema hyper-responsive to treatment: soft oedema with pitting - tissular hypo-anechogenicity (due to water inside the tissue), ectatic lymphatic collectors and rare presence of lymphatic lakes and /or canals. In his case physical and pharmacological treatment have to be performed.
2) lymphoedema hypo-responsive to treatment: hard oedema with no pitting - poor hypo-echogenicity component, diffuse dermal and subcutaneous hyper-echogenicity, due to fibrosis, sometimes interrupted by lymphatic lakes or canals. In this clinical-instrumental situation physical treatment has to be performed with particular utilisation of ultrasound and elastic compression;
3) lymphoedema with different responses to treatment: medium oedema - mixed echo-structural characteristics with lack of homogeneity of thickened subcutaneous tissue due to fluid with strips and areas of fibrosis. Lymphatic lakes and canals are possible.

A suitable therapeutic strategy will be effectuated based on the results of echography.
Echo-Colour-Doppler diagnostics provides important data to improve lymphoedema management and above all helps to establish rehabilitation programmes to optimise therapy.

S X - 3

ROLE OF HIGH RESOLUTION ULTRASONOGRAPHIC IMAGING AND MRI STUDIES IN PATIENTS WITH SECONDARY LYMPHEDEMA OF THE ARM

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Ecotomografia Medica Roma, Ospedale Fatebenefratelli, Rep. Radiologia

Accurate assessment of the swollen limb is very important in the patients with secondary lymphedema of arm. High resolution ultrasonographic imaging (US) and magnetic resonance imaging (MRI) were used in the management of these patients in the aim of to evaluate the clinical utility of this procedures. The patients were studied with high resolution ultrasonography and MRI to assess the characteristics of the swellings and associated muscle-skeletal lesions.
Qualitative characteristics of swelling, as well as its extent and distribution, presence of limphangiectasies and "lakes" were well demonstrated with high resolution ultrasonographic. Quantitative characteristics of swelling and related lesions of muscle-skeletal structures were better demonstrated with MRI. While ultrasonographic study represents diagnostic procedure of choice in the patients with arm lymphedema; MRI offers quantitative evaluation of swelling and studies more accurately the muscular, articolar, nervous lesions.

S X - 4

THE EFFECT OF ORIENTAL DRUGS ON LYMPHEDMA TREATMENT

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Chinese and Japanese traditional drugs are characterized by multiple components, pharmacological effects of which are going on at the same time in one body and selected & ruled out combination of plants after a long history of prescription and observation of adverse effects such as drug eruption & hepato-reno-hematological toxicity. The both Hochuekkitou (Tj.41) and Juzendaihotou (Tj.48) are known to promote immunity and to increase IFN.

Material & Method. 1.Ten cases of lymphedema are treated by combination of oral oriental drugs, Hochuekkitou (Tj. 41) & Juzenndaihoutou (Tj. 48), given 7.5g per day respectively and a new physiotherapy by magnetic fields, vibration and hyperthermia (Ohkuma: Lymphology, 35(Suppl.): 324-327, 2002). One treatment course consists of daily application of physiotherapy for an hour for a month. One to 4 treatment courses with 3 months' intermission between each are given and oral drugs as well as compression by bandages are given continuously during this period. 2. Fifteen cases are given only the physiotherapy with compression dispensing oral drugs. 3. Only oral durs (5 cases). 4. Compression alone (5 patients).

Result. Group 1 is more effective than any others.

Discussion. The author has used any oral drugs not in order to decrease edema but to inhibit the tissue changes due to invading microorganisms specially bacteria. The primary and secondary lymphedema patients show lowered immunity (Ohkuma: Lymphology 37(Suppl.): 313-318, 2004). The both drugs used in this trial are thought either to stimulate the immunity or to increase IFN. The treatment of lymphedema must be aimed not only to decrease edema but also to inhibit the tissue changes due to invading bacteria. It is well known that even though the edema has gone after therapy, without a complete compression, it comes back again.

Conclusion. The physiotherapy by magnetic fields, vibration and hyperthermia combined with oral oriental drugs, Tj.41 and Tj.48 is very effective.

S X - 5

MANAGEMENT OF LYMPHATIC DYSPLASIAS IN NEWBORNS

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The term "lymphatic dysplasia syndrome" includes primary (idiopathic) lymphedema syndromes, congenital chylothorax, idiopathic effusions (often chylous). The lymphatic dysplasia syndrome encompasses effusions of the pericardium, pleura, peritoneum, and lymphedema, without an identifiable cause, such as cancer or injury, and in absence of lymphangiomas, lymphangiectasis, and lymphangiomatosis. The majority of patients who are affected by lymphatic dysplasia syndromes have hypoplastic or aplastic peripheral lymphatics. One-third have obstructed proximal lymphatics. A few have hyperplastic peripheral lymphatics. Finally, some have incompetent lymphatic valves that develop into megalynphatics.

Congenital lymphedema may be caused by a) congenital aplasia or hypoplasia of periferal lymphatic, b) congenital abnormalities of the abdominal or thoracic lymphatic trunks, and c) congenital valvular incompetence, usually associated with megalymphatics.

In the newborn, chylothorax, chylopericardium, and chylous ascites, as well as generalized lymphatic dysplasia may occur as separated or associated entities. Diagnosis and management of a newborn affected by primary lymphedema is a challenge. Early diagnosis during the neonatal age is very important to prevent the rapid evolution of lymphedema.

The neonatologist should start to care infants with "lymphatic dysplasia syndrome" antenatally, when the mother is referred to a tertiary center. Neonatologist should aid obstetric team in counseling the parents regarding the delivery and expected outcome. Delivery room management might be a challenge and multiple procedure might be required. Tracheal intubation and assisted ventilation are usually necessary; when effective gas exchange is not reached, sterile thoracentesis and/or paracentesis if ascites occurs must be considered. Fluid replacement, inotropic support and, in case of PPHN, ventilatory management with HFOV and/or NO may be necessary. Airway, chest wall, and pulmonary edema, pleural effusion, pulmonary ipoplasia with associated RDS, perinatal depression, hypoxia, and acidosis are main problems occurring during delivery room resuscitation and then during at birth stabilization. The diagnosis of lymphedema is mainly clinical and relies primarily on family history and physical exam. Initially, the edema is soft and pitting, but over the course of months and years, the swelling becomes hard and "non-pitting" and the skin thickens. Early diagnosis during the neonatal age is very important to prevent the rapid evolution of lymphedema. We report some examples of congenital lymphatic dysplasias in newborns with a particular regard to congenital chylothorax that very often occurs at birth as a severe complication.

Finally, we discuss the diagnostic flow-chart that more generally encompasses all conditions presenting as non-immune hydrops fetalis.

S X - 6

MANAGEMENT OF PERIPHERAL LYMPHEDEMA

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Peripheral Lymphedema is not only a rich protein edema responsible for a swelling but also a potential risk of complications, a decrease of limb mobility, a change of the body image resulting in an deterioration of the quality of life
Management of peripheral lymphedema has to take in charge all these different components of the mechanical lymphatic insufficiency.
The ideal target is to get a come back to volume and shape normality but unfortunately it is more a dream than a reality whatever the type of treatment; conservative or surgical.
Without any doubt mainly with the conservative treatment we are able to improve the patient's situation and sometimes to reduce the swelling drastically whatever the affected limb, upper or lower limb. Unfortunately some tissue changes, which are produced by the mechanic lymphatic insufficiency, are difficult to modify. Mobile substances can be more or less eliminated but old fibrosis, fat deposition or changes into the"fondamental substance"are much more difficult to treat.
These tissue changes limits our possibilities to restore the normality.
Nevertheless a "correct" complex decongestive treatment" under the conditions to follow all the recommended points (skin care, manual lymphatic drainage, bandaging and mobilization, treatment of any infections and other associated diseases) can produce a very important improvement of the patient.
Restoring a complete normal lymphatic function with surgical means (derivative surgery, nodes transplantation, etc) remains exceptional due to the tissue changes (fibrosis into the prelymphatic spaces blocking the initial lymphatic function- endo or peri lymphatic vessels fibrosis)
Decrease the swelling by surgery has been and is proposed by some team.

- lymphangiectomy seems to be limited to a final procedure after swelling reduction for some patients at the end of decongestive therapy or in some countries having not any conservative treatment available
- lympho- lipo-aspiration is proposed by some authors.

The consequences of any drastic removal of tissue must be considered carefully and we must remains prudent awaiting what will be the evolution, with time, mainly for the limb function before accepting this procedure as safe.
Whatever the treatments the stability is an other difficult point (patient's compliance, unpredictable events, etc) underlining the absolute necessity to keep the contact regularly with each patient.
The need of manual lymphatic drainage, times to times, can be a nice mean for this objective. It is the same for the need to change the elastic support which must be an opportunity for the lymphologist to keep the contact.
But we would like to add that facing the difficult problem to get a complete restoration of the normal situation some authors have underlined the great importance of the limb function restoration, which is not proportionally related to the swelling reduction
According to the psychology of each patient we must adapt all the elements of the strategy keeping in mind the importance to control the worsening events. We must add that the patient's education remains a central key of the patient's improvement Trying to make the patient able to practice some auto-treatment can be very usefull.
Being incapable to completely normalize the situation, the right therapeutic strategy must remain the research of the better quality of life, looking to maintain a right balance between advantages and disadvantages of the treatments. A good collaboration between patient, physiotherapist and medical lymphologist is the corner stone of this type of treatment.

S X - 7

THE MOST IMPORTANT TIME IS THE FIRST CONSULTATION

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We often tried to report our personal conception of the treatment of lymphedema. That requires active collaboration between the lymphologist (and all the team of the unit of treatment of oedema). The physiotherapist and the physician, but also and expecially the patient who remains the principal link of the chain of treatment. We described this scheme with a classical sequence of:

- intensive treatment in a peculiar structure (specialized unit)
- conservative treatment by a physiotherapist (taught in a special school dedicated to lymphological practice) all the life, supervised by the personal physician of the patient. Contention is necessary (elastic stockings).
- active collaboration of the patient who accepts classical prescription of preventive attitude but essentially also accepts the concept of "all the life treatments".

There are two dangers and extremist attitudes for these patients: obsession or renounciation.
The precise role of the lymphologist practioner is to convince the patient of the beneficial character of the sequence of this scheme. The role of the first consultation is of prime importance. During one hour, it's done by the lymphologist and a physiotherapist of the team. They proceed to the classical interrogatory and the clinical examination.
But they explain very carefully that the good results of the sequential treatment depends very much upon the active collaboration of the patient.

S X - 8

INDICATION AND CONTRAINDICATION TO THE PHYSICAL TREATMENT

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Physical combined treatment is worldwide recognized as the most effectiveness approach in the fight against lymphedema. It can be differentiated basing on the stage of lymphedema, the age and the general condition of the patient.
In our personal casuistry among 324 patient underwent a physical combined treatment, during the cycle of M.L.D., 34 of them performed a partial application of technique of which 12 for the whole cycle (9 for orthopaedic tutors, 3 on the residual portion of the amputated limb). 2 patients were completely untreated for presence of intra vessel neoplastic thrombosis.
Sequential pressure therapy could be useful in case of an oedema rich of water.This aspect underline its main contraindication in subjects with hypertension and/or cardiac lacks of balances.
In fact among the 324 patients considered before, except for the orthopaedics with tutor and the amputated, in 23 of them a severe increase of blood pressure after the session was observed. In 12 was interrupted for lymphangitis of the treated limb up to its resolution.
Elastic compression is the main tool as regard the achievement of the best final results. A physical combined treatment without elastic compression is totally useless. Elastic compression could promote, in some cases, a general sense of discomfort gave by the overlapping of bandages in more layers as more advanced is the stage of lymphedema.
In fact we consider a limb with an absolute necessity of bandage immediately from the second stage in advance. Another aspect that promotes an absolute indication of elastic compression is the good capability of the patient in execution of physical activity during the day. Therapeutic bandage on a late staged and fibrotic oedema is often useful to isolate fibrotic areas and locate the less organized of them in order to attempt applications of ultrasound and try to obtain a tissutal lysis. The contraindication in elastic compression therapy are gave by skin inflammation.
Cases of dispnoic sensations referred by some patients are related to a bad compliance of them in acceptance of bandaging. All the patients of the casuistry, except for orthopaedics with tutor (9 cases), were bandaged. Suspension were respected during lymphangitis (12 cases). A total refuse notwithstanding mild overlapping of bandages was observed in 25 cases.
Physical exercises must promote a muscular and articulations recovery above all in the late stages where, as often we observe at the T.C. scan, there is the presence of muscular atrophies or severe reduction in articulations degrees.
Over then the ultrasounds, as told before, we must mention also electrical stimulation in case of severe muscular lack of balance.
In 17 cases of late stage of lymphedema with lymphatic ulcers was performed laser therapy (5 minutes every 5 cm2) up to the complete "restitutio ad integrum".
Contraindications in application of physical instruments are the same of traditional literature about.

S X - 9

MONITORING OF THE EDEMATOUS LIMB

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The introduction of more and more elaborate and perfected diagnostic and instrumental methodologies has allowed all of vascular pathology, including lymphatic, to substantiate the clinical experiences within more codifiable and controlled conditions.
Needless to say, this all leads to undeniable rebound effects and benefits on the operational level.
During treament of an edematous limb an important factor works itself into the need for monitoring of the limb in all its aspects, especially in regards to morphological and volumetric variations that take place during the decongestive period of treatment.
For this reason, it goes to say that many studies have focused tremendously on this aspect, which have produced a very broad and thorough paper edited by SIDVG – GIUV, which has seen close cooperation from qualified centres, laying down the main guidelines to follow.
Our work takes off from this coding for the purpose of advancing, along the same lines of the publication, a methodology capable of following, through time, the evolution of the lymphatic edema.
The methods of monitoring taken into study are ultrasound examinations of the soft tissue and volumetric surveys. While the first records the characteristics of the morphologic profile, and in time, evolution of the tissual alteration, especially the characteristics of the subcataneous and presence, including extent, of the lymphatic extravasations, the second allows to follow concurrently the effects of the therapuetic treatment used. The volumetric, global or segmental survey does not require special expedients or resort to specific instrumentalities, and true to our experience, shows to have an excellent degree of reliability.
A specifically designed software has been developed that stores within a database a series of surveys at pre-determined levels that allow attaining volumetric values, and possibly compare them in percentile terms both with the counterlateral limb, as well as with the previous homolateral measurings, at the same time the ultrasounds are reported according to a specific chart. This software allows to monitor concurrently, on one hand, the therapeutic treatment adopted, the possible compressive and medical therapy, while on the other, the outcomes and surveys conducted.
The results are easy to read and access, seeing the simplicity of the programme offered, allowing to constantly monitor progress of the treatment, compare clinical cases and basically attain the objective evaluations of the therapeutic path undertaken.

S X - 10

TAILORED GARMENTS FOR LYMPHEDEMA IN PARTICULAR CLINICAL CASES

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Lymphedema garments do not belong to the everyday work of an orthopedic technician. The measurement methods differ notably from the regular measuring of varix stockings. This is especially relevant for atypical lymphedema forms. For this, the orthopedic technician requires long-term, numerous, practical measurement experience.
For instance, the correct garment must be determined for each edema form.
– For the arms: One-piece stocking with glove and fingers? Two-piece? With a long glove to wear over it?
– For the legs: Two-piece pantyhose? One-piece? Layered garments: stocking to wear over stocking? Sewed-in padding i.e. between the malleolus and Achilles tendon? Foot cap for singular toes?
Only flat-knitted material should be used.
We can only reach optimal results if we cooperate with lymphologists, experience orthodpedic technicians and manufacturers.

S X - 11

HYDROKINESI THERAPY AS A USEFULL SUPPORT TO THE TREATMENT OF PRIMARY AND SECONDARY LYMPHOEDEMA OF LOWER AND UPPER LIMBS

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Lymphoedema is a disabling desease, often chronic and gradual worsening, which affects the patient in his/her psycho-phisicity.
The rehabilitative procedure should include all the affected function (muscles, neurological system, pain, reduction of the range of movement, psychological aspects) not only the reduction of the edema.
The use of hydrokinesi therapy, with a basic rehabilitative treatment, allows to reduce the time and increases the quality of the recovery process.
Utilising the physical proprieties of the water gives the possibility o executing adapted exercises addressed to this pathology, it increases the therapeutic benefit more than the vascular walking exercise and guarantees a global therapy.

THE EUROPEAN JOURNAL
OF
lymphology
and related problems
VOLUME 15 • No. 44 • 2005
INDEXED IN EXCERPTA MEDICA

CALENDAR

XX International Congress of Lymphology
I CONGRESSO BRASILEIRO DE LINFOLOGIA
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President: Mauro Andrade (Brazil) - *Honorary President:* Robert Cluzan (France)
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16-19 June, Chicago (USA)
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24-25 June 2005, Crete, Greece
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26-29 June, Siena (ITA)
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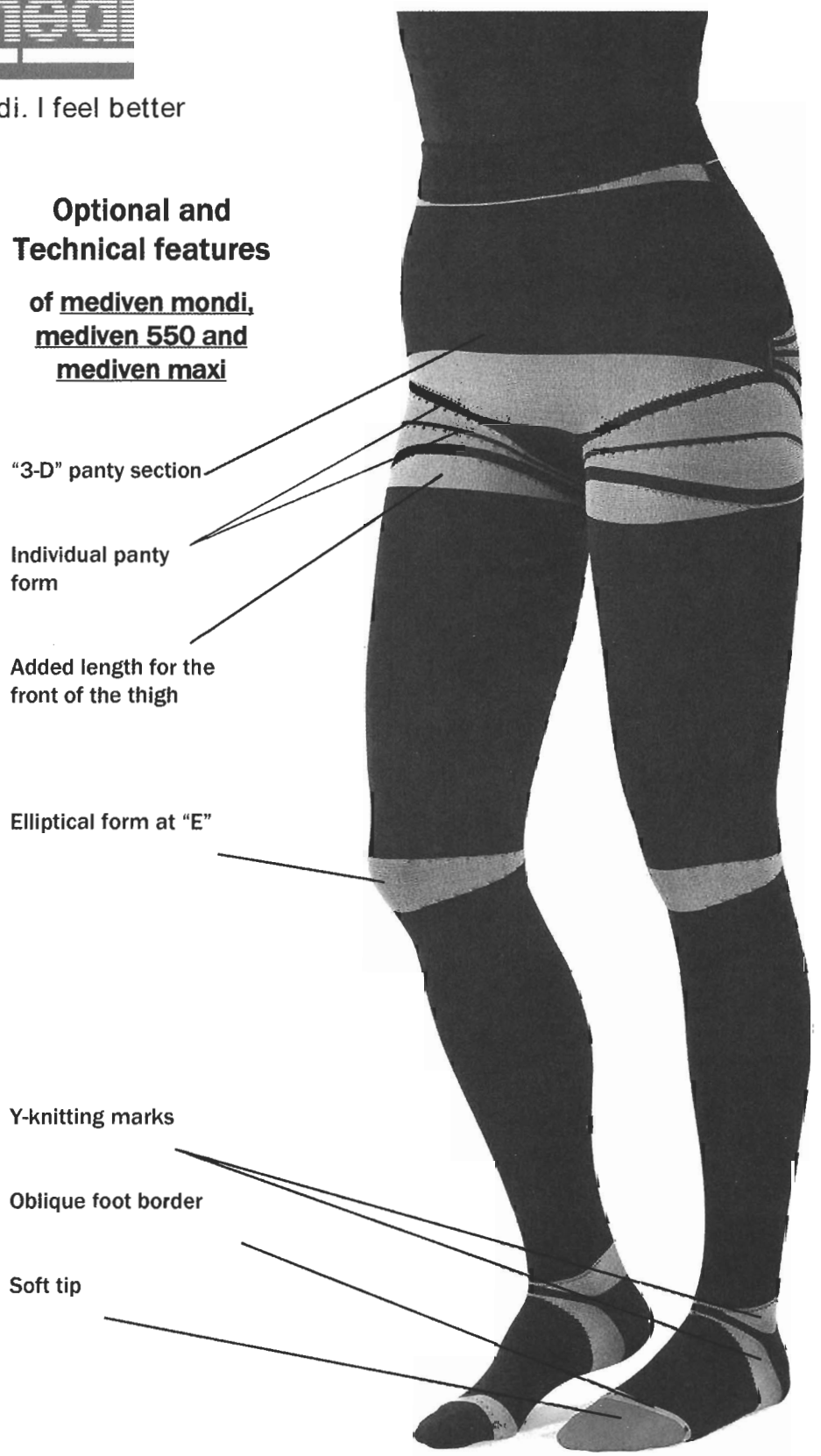
Optional and Technical features

of mediven mondi, mediven 550 and mediven maxi



It is estimated that about 13 milion people all over the world suffer from disorders of the lymphatic system. All these different clinical pictures require very individual compression garnments , exactly customised to each patient's personal needs. **medi has the answer- customed made hosiery.** It is vital that compression stockings for lymphoedema/lipoedema patients are always made to measure simply because they are part of everyday lives.

Medi has been producing flat-knitted stockings for over 50 years. This experience has culminated in an assortment of flat-knitted seamed compression hosiery.

With their product ranges **mediven mondi, mediven 550 and mediven maxi,** medi has created a premium quality brand with that little something special: the medi concept factor.

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