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and related problems

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SUMMARY

XXXIX Congress of European Society of Lymphology

Valencia (Spain) - 6-8 June, 2013

Hospital Universitari i Politècnic "La Fe"
 Bulevar Sur, s/n, 46026 Valencia, Spain

Clinical Sciences

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THE EUROPEAN JOURNAL OF LYMPHOLOGY AND RELATED PROBLEMS (EJLRP)

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

Topics

The topics include:

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

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

They will be subdivided in Clinical and Basic Sciences.

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

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

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

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**39th Congress
of European Society
of Lymphology**

**June 6-8, 2013
Valencia - Spain**

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European Society of Lymphology

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Groupement Européen de
Lymphologie

XXXIX CONGRESS

Valencia (Spain) - June 6-8, 2013

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The 39th Congress of the European Society of Lymphology (ESL 2013) will be held at the Auditorium SALON DE ACTOS, Hospital Universitari I Politècnic La Fe.

Programme

1º CURSO DE LINFOLOGÍA

Jueves 6 de Junio de 2013

08:30	Apertura del Curso <i>Isabel Forner-Cordero</i>
08:40	Inicios de la linfología en España Margarita Serra Escorihuela
08:55	Factores de riesgo, fisiopatología y etiología del linfedema Ángeles Forner-Cordero
09:05	Cirugía cáncer de mama: abordajes, Técnica de ganglio centinela Elvira Buch Villa
09:20	Manifestaciones clínicas del linfedema relacionado con cáncer de mama Dolores Maldonado Garrido
09:35	Linfedema de miembro inferior Isabel Forner-Cordero
09:50	Flebolinfedema y síndrome postrombótico Ignacio Sánchez Névarez
10:05	Linfedema asociado a Síndromes congénitos Antonio Pérez-Aytes
10:25	Coloquio
10:45	PAUSA CAFÉ
11:15	Sistemas de medición Enrique Cuello-Villaverde
11:30	Linfografía isotópica Cristina Ruiz Llorca
11:45	Valoración de la discapacidad Isabel Vázquez Arce
12:00	Escalas de valoración en linfedema Belén Alonso Álvarez
12:15	El desarrollo de la linfología en Andalucía Inmaculada García Montes
12:30	La visión del linfedema a través del Capítulo de Flebología y Linfología de la SEACV (Sociedad Española de Angiología y Cirugía Vasculare) Vicente Ibañez Esquembre
12:45	Coloquio
14:00	COMIDA
15:00	Programa educativo: escuela de linfedema M ^a José Navarro Collado
15:15	Terapia descongostiva de Linfedema M ^a Jesús Condón Huerta
15:35	Tratamiento de mantenimiento Laura Albiach Gascó
15:50	Cinesiterapia y cuidados de la piel Pilar Rel Monzó
16:05	Prendas de compresión José Alabau Ribes
16:20	Manejo hospitalario del paciente pluripatológico Eva Calabuig Muñoz
16:35	Coloquio
17:00	PAUSA

17:30

MESA REDONDA: CASOS ESPECIALES DE LINFEDEMA: Linfedema genital, linfedema de la mama, linfedema en el anciano, linfedema de la cara, linfedema maligno, linfedema de origen desconocido, linfedema y embarazo

Carolina de Miguel Benadiba, Isabel Vázquez Arce, Marisa Catasús Clavé, Francisco Santos Andrés, Jose Muñoz Langa, Dolores Maldonado Garrido, Isabel Forner-Cordero

Viernes 7 de Junio de 2013

Workshop 1

Manual Lymphatic drainage

Prof. Dr. Etelka Földi

08:30

Lymphoedema treatment in practice
by Prof. E. Földi

Manual Lymphatic Drainage
by Regina Englisch from Földi Klinik

Bandages
by Regina Englisch from Földi Klinik

Compression garments
by Hans von Zimmerman

Workshop 2

Bandages in decongestive lymphatic therapy

Prof. Christine Moffat

11:30

Challenges and solutions for decongestive therapy - an introduction to the new 3M Coban 2 Compression System

Workshop 3

Cuidado de las heridas crónicas en paciente con afectación linfática

Carmen Alba Moratilla

Enfermera referente de heridas en el Dep. de Salud Valencia-Clinico-Malvarrosa. Responsable de la "Unidad Funcional de Heridas" del H. Clínico de Valencia

Workshop 4

Herramientas diagnósticas en linfedema

18:00

Eco-doppler en el diagnóstico de enfermedad venosa

Dr. Sánchez Névarez

Linfangiografías diagnósticas y terapéuticas: linfangiografía transnodal con lipiodol, ECO de alta resolución, Linfangio-RM

Dr. F.M. Gómez

Linfografía isotópica

C. Ruiz-Llorca

Sábado 8 de Junio de 2013

Workshop 5

New system of bandages and compression

09:00

Maria Kumlien-Valero

Workshop 6

Maintenance treatment: new compression devices. Medi. Inelastic bandages in decongestive lymphatic therapy

11:30

Els. R. Brouwer, Dr. R.J. Damstra, Nij Smellnghe Hospital, Drachten, The Netherlands

39th Congress of European Society of Lymphology

Friday 7th June 2013		
	Salon de Actos	
08:30	Welcome to the Congress	
	Session 1	
	CLINICAL FEATURES AND DIAGNOSIS	
	<i>Chairmen: Michelini S., Bourgeois P., Viosca E.</i>	
08:40	Genetic studies in Lymphedema Sandro Michelini	15:00
09:00	Prevalence of lymphedema Christine Moffat	15:10
09:20	Scars and lymphatics Oldrich Eliska	15:20
09:40	AWS: nature and localization. MRI and US imaging correlated with clinical anatomy Olivier Leduc	15:30
10:00	Patient: The center of patholymphology - problems and questions Evangelos Dimakakos	15:40
10:20	O1 - Lymphedema predictor factors after breast cancer surgery, a survival analysis Roser Belmonte	16:00
10:30	O2 - Staging lymph edema by means of echography imaging: subjective image evaluation, echodensity analysis and acoustic structure quantification An Tassenoy	16:20
10:40	Discussion	16:30
11:00	Opening ceremony	16:40
11:10	COFFEE BREAK	17:00
	Session 2	
	DIAGNOSTIC TOOLS IN LYMPHOLOGY	
	<i>Chairmen: Leduc A., Papendieck C., Miralles M.</i>	
11:30	LYMPHOSCINTIGRAPHY. Anatomical and lymphoscintigraphic data about the collateralisation lymphatic pathways in cases of patients with Upper or Lower Limb Oedema Pierre Bourgeois	16:30
11:50	Overgrowth Syndromes in pediatrics Cristóbal Papendieck	
12:10	The role of duplex scanning in the diagnosis of venous diseases Manuel Miralles	
12:30	Lymphofluoroscopy in lymphoedema Jean-Paul Belgrado	
12:50	Back and forward in diagnostic and therapeutic lymphangiographies: lipiodol transnodal lymphangiography, high frequency skin ultrasound and MRI lymphangiography Fernando Gomez	
13:10	Congenital chylous effusions of the neonate. A worldwide experience Carlo Bellini	
13:30	Discussion	
14:00	LUNCH	
		Session 3
		DECONGESTIVE LYMPHATIC THERAPY
		<i>Chairmen: Földi E., Piller N., Forner-Cordero I.</i>
		O3 - Contribution of an educational program to the management and self-care of lymphedema Marta Garcia-Mifsud
		O4 - Breast edema following breast conserving surgery and radiotherapy. Preliminary results Karin Johansson
		O5- An easy device for night compression in the maintenance treatment of lymphedema Javiera Langhaus-Nixon
		O6 - Long-term consequences on the quality of life and function of patients wearing compression garments in treatment of chronic upper limb lymphoedema related to breast cancer Maria Pérez-Pomares
		MLD and other treatments; How do we know they are working? Neil Piller
		Urban legend: Attitudes like physiotherapy may worsen the prognosis in advanced cancer patients Antonio Llombart-Cussac
		O7 - "Lympho-taping" to reduce hematoma after liposuction: a "double blind" clinical randomised trial, preliminary results Jean-Paul Belgrado
		O22- Linforoll: a new device for lymphoedema treatment. Preliminary experience Sandro Michelini
		Discussion
		BREAK
		Room H004
		ORAL COMMUNICATIONS
		O8- Adaptive ability of cardiac lymphatic vessels and veins in response to cardiac hypertrophy Eikichi Okada
		O9- Treatment of lymphedema of the lower limbs in patients affected by severe peripheral arterial disease Amer Hamadé
		O10- Use of taping technique in healing processes related to the presence of oedema Alessandro Failla
		O11- Homeostatic inflammation in lymphedema Moriya Ohkuma
		O12- Imaging of lymph collectors and nodes by RMI in lymphedema. Interest for physiotherapy Jean-Patrice Brun
		O13- Psychosocial integration in pediatrics combined angiodisplasic syndromes Daiana Laguado

Session 4

MAINTENANCE PHASE

Chairmen: Partsch H., Schingale F., Maldonado D.

- 17:30 **Pressure time integral and efficacy of compression devices**
Hugo Parstch
- 17:50 **LYMQOL: a condition specific quality of life tool for limb lymphoedema**
Vaughan Keeley
- 18:10 **Skin changes in chronic lymphoedema: causes and therapeutic consequences**
Etelka Földi
- 18:30 **Therapeutic education of children with lymphedema and their families**
Isabelle Queré
- 18:50 **VIDEO ESL HISTORY**
Oldrich Eliska
- 19:30 **Discussion**

Oral communication Room H004

Chairmen: Hamadé A., Papendieck C., Gómez F.

Saturday 8th June 2013

Salon de Actos

Oral communications

Chairmen: Boccardo F., Pissas A., Buch E.

- 08:00 **O14 - Selective liposuction in fibrosis of limb lymphedema**
Jean-Patrice Brun
- 08:10 **O15 - Microsurgical lymphovenous anastomoses after 45 years. Follow-up and contemporary indications**
Waldemar L. Olszewski
- 08:20 **O16 - Outcomes of lymphaticovenous side-to-end anastomosis in patients with breast cancer related lymphedema**
Jiro Maegawa
- 08:30 **O17 - Lymphedema after axillary lymph node dissection vs sentinel lymph node biopsy**
O. Aburedwan
- 08:40 **O18 - Arm lymphoedema in patients with sentinel-node negative breast cancer**
MP Sánchez-Tarifa
- 08:50 **O19 - Post-mastectomy pain syndrom and secondary lymphoedema**
Martin Wald

- 09:00 **O20 - The concept of sentinel lymphnode: are we confident? Opening the reflection**
Alexandre Pissas

- 09:10 **O21 - The influence of preventive microsurgical lymph node transplantation and lymph-venous anastomose(s) on the incidence and prognosis of BCRL in high-risk BC survivors**
Nele Adriaenssens

Session 5

LIPPEDEMA

Chairmen: Brorson H., Belgrado J.P., Muñoz-Langa J.

- 09:30 **Physiopathology of lipedema**
Gyozo Szolnok
- 09:45 **Clinical aspects of lipedema**
Isabel Forner-Cordero
- 10:00 **Treatment of lipedema**
Franz J. Schingale
- 10:20 **O23 - Tonometry in measuring effectiveness of conservative combined treatment in lipedema patients**
Marco Cardone
- 10:40 **Discussion**
- 11:00 **COFFEE BREAK**

Session 6

SURGICAL TECHNIQUES IN LYMPHEDEMA

Chairmen: Campisi C., Baumeister R., Sanchez-Nevarez I.

- 11:30 **Present Role and Effectiveness of Derivative-Reconstructive Lymphatic Microsurgery for Limb Lymphedema: 40 years of Research and Clinical Experience**
Corradino Campisi
- 11:50 **LYMPHA technique: five years follow-up in primary surgical prevention of secondary lymphedema**
Francesco Boccardo
- 12:10 **Combined surgical treatment for lymphedema**
Jaume Masia
- 12:30 **Quality of life after reconstructive lymphovascular microsurgery**
Rudiger Baumeister
- 12:50 **From LYMPH to FAT: The role of liposuction in lymphedema**
Hakan Brorson
- 13:30 **Discussion**
- 13:50 **End of the Congress**
- 14:00 **GENERAL ASSEMBLY OF THE ESL**

Thursday 6th June 2013 - Room H004

1º Curso de linfología

INICIOS DE LA LINFOLOGÍA EN ESPAÑA

DRA. MARGARITA SERRA ESCORIHUELA

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FISIOPATOLOGÍA, FACTORES DE RIESGO Y ETIOLOGÍA DEL LINFEDEMA

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El linfedema se define como un aumento anormal de líquido rico en proteínas en el espacio intersticial debido a una alteración en la capacidad de transporte del sistema linfático. Es una enfermedad crónica que tiende a la progresión continua si no se trata, implicando un deterioro considerable de la calidad de vida. El verdadero desencadenante para padecer un linfedema es desconocido, aunque existen varios factores que predisponen al individuo a desarrollarlo, a predecir la progresión o la severidad. La identificación adecuada de estos factores ayuda a identificar precozmente los pacientes de riesgo, implementarlos con estrategias de prevención e implicarlos en el seguimiento de su patología mediante la auto-observación (grado de recomendación C). El linfedema se clasifica en primario y secundario según la etiológica. El linfedema primario se asocia a una anomalía congénita de los vasos linfáticos. Se puede presentar desde el nacimiento o en la primera década de la vida, como la enfermedad de Milroy, de forma precoz, más frecuente en mujeres, o tardíamente, más allá de los 30 o 40 años. En el linfedema secundario son factores externos los que dificultan el drenaje. En este grupo, la causa más frecuente en el mundo es la infección por filaria y en los países desarrollados los de naturaleza neoplásica.

CIRUGÍA DEL CÁNCER DE MAMA: ABORDAJES, TÉCNICA DEL GANGLIO CENTINELA

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La cirugía del cáncer de mama (CM) se ha modificado en los últimos años, en gran medida siguiendo los avances del tratamiento sistémicos (quimioterapia, hormonoterapia) y locales (Radioterapia). Dicha cirugía ha variado desde las grandes mutilaciones de las técnicas de Halsted y Prudente donde desarticulaba el brazo, hasta la cirugía conservadora (CC) actual. Incluso la misma CC ha variado en estos años apareciendo las técnicas de cirugía oncológica, donde se integran técnicas, hasta hace poco, limitadas al cirujano plástico. En el momento actual la cirugía sobre la mama ha dejado de ser un arrancamiento y mutilación a una cirugía que necesita un aprendizaje especializado. Aunque, la mastectomía sigue teniendo un lugar en el tratamiento del CM, cada vez este es más pequeño. Un ejemplo práctico son los tumores centrales, hasta hace poco era una indicación de mastectomía, posteriormente se incluyó las cirugías en huso que mantenían el escote sin tocar y la mujer no necesitaba prótesis externas, y en la actualidad la técnica del colgajo dermoglandular de Grisotti, remodela el complejo areola-pezones, evitando el aplanamiento de la mama que producía la incisión en huso. En abordaje de la axila, de forma genérica se realizaba mediante una linfadenectomía axilar (LA), con ella no estábamos realizando, realmente, un tratamiento sino recogíamos datos para el pronóstico del CM. la LA se ha sustituido, casi en todas partes, por la biopsia selectiva del ganglio centinela (BSGC) en los cánceres precoces. Sin embargo en los CM avanzados la BSGC sigue en controversia. Una de las bases para la realización de la BSGC era disminuir la morbilidad en el brazo intervenido, pero se ha comprobado que esta técnica no elimina el desarrollo de esta morbilidad.

MANIFESTACIONES CLÍNICAS DEL LINFEDEMA RELACIONADO CON CÁNCER DE MAMA

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El linfedema relacionado con cáncer de mama es el de mayor prevalencia en nuestro medio. Su prevalencia es variable porque no existe una unificación de criterios en los métodos de medición del edema y hay gran variabilidad en el tiempo de seguimiento de las pacientes. Los factores de riesgo para sufrir linfedema son los relacionados con el tratamiento (cirugía, quimioterapia y radioterapia), la enfermedad (estadio tumoral y ganglionar, número de ganglios linfáticos afectados, localización tumoral) y clínicos del enfermo (edad, IMC, HTA, infección, uso excesivo brazo, linfedema precoz). La evidencia demuestra que la valoración y tratamiento precoz del linfedema relacionado con el cáncer de mama y sus complicaciones mejora la calidad de vida de las pacientes. Los síntomas más comunes son edema, tensión, pesadez, disconfort y debilidad. En caso de dolor hay que investigar su causa para descartar complicaciones asociadas al linfedema. En la exploración hay que definir la localización del edema. La consistencia del mismo y si deja o no fovea. Valorar cambios de coloración y temperatura de la piel, que puedan hacer sospechar de complicaciones asociadas, hacer una exploración ortopédica de la extremidad superior y medir el volumen del edema. Recomendando el método de la circimetría porque es rápido y simple de realizar en la consulta. La medición del volumen es fundamental para monitorizar los resultados de los tratamientos. El uso de escalas para medir la función y calidad de vida es útil para el abordaje multidisciplinar de estas pacientes. Las complicaciones asociadas al linfedema son: Precoces, normalmente asociadas al tratamiento del cáncer de mama: hematoma, seroma, infección, fuga linfática, dolor y limitación hombro (Upper Body Syndrome), adherencia cicatricial, síndrome de la red axilar, neuropatía de N. Torácico largo, acortamiento del pectoral, quemadura por radioterapia. Las tardías: propias del linfedema son: Inflamatorias, infecciosas, ortopédicas, dolor, parestia, alteración de la imagen corporal y malignización.

LINFEDEMA DE MIEMBRO INFERIOR

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El edema en miembros inferiores puede deberse a múltiples causas y el diagnóstico etiológico es en ocasiones un reto, sobre todo cuando se presenta en estadios avanzados. Las causas sistémicas, como insuficiencia cardíaca congestiva, hipoalbuminemia, insuficiencia renal, síndrome nefrótico y hepatopatía avanzada son reconocidas habitualmente en Atención Primaria. Las causas locales como el linfedema, enfermedad venosa crónica, lipedema y trombosis venosa profunda, pueden ser más difíciles de diagnosticar. Los pacientes mal diagnosticados van a someterse a estudios y tratamientos inadecuados, exponiéndose a riesgos innecesarios y procedimientos incorrectos, lo que les conduce a prolongar sus síntomas y a la aparición de complicaciones. Los objetivos son descartar una causa obstructiva del sistema linfático, como las neoplasias, diferenciar entre linfedema primario y secundario, realizar una valoración funcional, evaluar las consecuencias sistémicas y alteraciones asociadas e identificar el síndrome.

La anamnesis y la exploración física permiten el diagnóstico de sospecha, pero se recomienda la realización de pruebas complementarias que confirmen el diagnóstico de linfedema, flebedema, lipedema u otros edemas, y aporten datos sobre su causa. Se recomienda un análisis de sangre general para descartar causas sistémicas, determinar el valor de proteínas séricas y de hormonas tiroideas. Las anomalías que se pueden diagnosticar por eco-Doppler son las de causa linfática (estasis intersticial, lagunas en hipodermis, fibrosis hipertrófica, lipodermatosclerosis, linfangiectasias y varices linfáticas) y descartar sobre todo patología venosa (trombosis venosas superficial y profunda, estenosis, compresión extrínseca o posicional) y arterial (postirradiación). La linfografía isotópica no es una técnica indispensable, pero es una herramienta útil en el diagnóstico diferencial, ya que permite distinguir la patología linfática de las causas no linfáticas de edema. Es una técnica fiable y segura, sin efectos secundarios, que además sirve para predecir el éxito de las terapias físicas del tratamiento conservador. Las pruebas radiológicas de la cavidad abdominopélvica (TAC y RNM) se emplean para el estudio de las cadenas ganglionares y de las vísceras en la detección de patología tumoral o presencia de adenopatías. La linfangiografía por resonancia magnética es un nuevo método diagnóstico, seguro y técnicamente factible, para visualizar las vías linfáticas con alta resolución en los pacientes con linfedema.

FLEBO-LINFEDEMA Y SÍNDROME POS-TROMBÓTICO

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FLEBOLINFEDEMA: Es una causa secundaria de linfedema provocado por la incapacidad del sistema linfático de drenar el líquido excedente del intersticio generado por una hipertensión venosa crónica. La sospecha clínica se produce cuando en un paciente con insuficiencia venosa crónica conocida de MMII presenta un cuadro de edema crónico que no cede totalmente con el reposo nocturno, aumenta a lo largo del día y afecta pies y dedos (lo cual suele respetarse en el edema venoso puro). En general es un linfedema leve en un estadio 2 y no suele llegar a estadio 3. Es menos frecuente en MMSS. Para su diagnóstico es necesario realizar una ecografía doppler venosa demostrando reflujo y signos de hipertensión venosa y una linfo-gammagrafía demostrando normalidad en el drenaje linfático. Su curso clínico suele ser benigno, como principales complicaciones están la célula-linfangitis y las úlceras recurrentes. En cuanto al tratamiento el pilar fundamental es la terapia compresiva mediante medias clase 2 (22-29 mmHg) en los casos no complicados y clase 3 (30-40 mmHg) cuando existen complicaciones. El tratamiento quirúrgico de la insuficiencia venosa puede mejorar los síntomas de pesadez y favorecer la cicatrización de úlceras pero tiene escaso efecto en el linfedema una vez instaurado. Las medidas de prevención consisten en cuidados de la piel mediante crema hidratantes, evitar el declive prolongado, ejercicios en posición supina como la natación y evitar traumatismos locales.

SÍNDROME POS-TROMBÓTICO (SPT): Es el conjunto de signos y síntomas que se suceden tras un episodio de trombosis venosa profunda (TVP), los signos son: edema, cambios de coloración en la piel, lipodermato-esclerosis, úlceras recurrentes, varices; los síntomas consisten en: pesadez, picores, calambres y dolor, todos de predominio vespertino. No se trata por tanto de una enfermedad concreta, pudiendo aparecer estos síntomas tras una insuficiencia venosa crónica por reflujo valvular profundo o superficial, trombosis del sistema safeno y de perforantes. Su causa no está totalmente clara, la inflamación tiene un rol fundamental, tanto como el daño valvular producido por el trombo, la hipertensión venosa crónica genera un incremento de la presión venosa-capilar, induce a la ruptura de vénulas con hemorragia subcutánea e incremento en la permeabilidad tisular. Cuando el edema persiste por la mañana y afecta pies y dedos, hablamos de flebolinfedema asociado. El SPT afecta entre un 23-60% de los pacientes a los 2 años de una TVP en MMII, de éstos un 10% desarrollará un síndrome severo con aparición de úlceras venosas, la incidencia de SPT en MMSS es menor (15-25%) y no suele ser tan limitante. La escala más utilizada para valorar tanto la presencia como severidad del SPT es la escala de Villalta (tabla 1). Afecta la calidad de vida en especial en el contexto físico y psicológico y puede limitar las actividades diarias, su tratamiento incrementa el coste del tratamiento de una TVP siendo el coste aproximado de unos 3500 euros por paciente el 1º año aumentando con el tiempo; produce además pérdidas de productividad laboral, los pacientes con SPT severo pierden hasta 2 días de trabajo al año. El diagnóstico es clínico, asociado a un precedente de TVP. Las opciones terapéuticas son limitadas y consisten en evitar el declive prolongado, terapia compresiva con medias homologadas, instrumentos de electroestimulación, medicamentos como el castaño de indias, rutósidos, pentoxifilina y recientemente la sulodexida. El cuidado de las úlceras es fundamental y en casos seleccionados los pacientes podrían beneficiarse de tratamientos quirúrgicos o endovasculares.

Tabla 1 - Escala de Villalta

Síntomas	Signos
Pesadez	Edema pretibial
Dolor	Piel indurada
Calambres	Hiperpigmentación
Prurito	Nueva ectasia venosa
Parestesias	Enrojecimiento
	Dolor a la compresión de pantorrilla
Definición	
Ausente	<5
Leve	5-9
Moderado	10-14
Severo	>15
Cada signo o síntoma recibe entre 0 (ausente) y 3 puntos (severo). La presencia de úlcera recibe 15 puntos	

LINFEDEMA ASOCIADO A SÍNDROMES CONGÉNITOS

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Aunque en la edad infantil también se pueden dar linfedemas secundarios a diversas causas (Infección, tumoraciones, traumas, excisión quirúrgica, etc...) en esta presentación incidiremos fundamentalmente en el Linfedema primario, y especialmente en los linfedemas que se presentan asociados a síndrome malformativos, la mayoría de ellos actualmente bien definidos clínicamente y con gen identificado, lo que permite su estudio con las actuales técnicas de genética molecular y el posterior asesoramiento genético/reproductor a la familia. Es de destacar que en estos linfedemas existe gran variabilidad clínica inter, e intrafamiliar (Diferente afectación clínica entre familias e incluso dentro de la misma familia). Un claro ejemplo de esto lo constituyen las mutaciones en gen *FOXC2*, con diferentes cuadros sindrómicos asociados a mutaciones en el mismo gen.

Desde el punto de vista clínico podríamos dividirlos en dos grandes grupos (Blein et al; 2012):

- Linfedemas primarios aislados: Linfedema es la única manifestación clínica sin otras anomalías o malformaciones asociadas
- Linfedemas primarios asociados a síndromes malformativos. Son los que podríamos también denominar: "Linfedemas sindrómicos"

1) LINFEDEMAS PRIMARIOS AISLADOS:

1. **Enfermedad de Milroy** (Linfedema hereditario tipo I): Típica afectación en extremidades inferiores. Puede existir presentación prenatal con afectación grave fetal con linfedema generalizado. Herencia autosómico dominante (50% riesgo transmisión a su descendencia). Gen: *VEGFR3*.
2. **Enf. De Meige** (Linfedema hereditario tipo I): Aparición de linfedema más tardío y menos severo que en Milroy. A. dominante. Gen: *FOXC2*.

2) LINFEDEMAS SINDRÓMICOS:

1. **Síndrome de Turner:** Diagnosticable en Cariotipo (45, XO u otras anomalías: crom. X en anillo, mosaicismo XX/XO ...) Linfedema "en bota" al nacer. Puede dar Higroma quístico nuchal en época fetal. Son mujeres estériles. En general buen desarrollo neurológico.
2. **Síndrome de Noonan:** Causado por mutaciones en gen *PTPN11* (50% casos). Otros genes menos frecuentes: *SOS1*, *RAF1*, *MEK1*. En época fetal puede dar: Higroma quístico nuchal y/o quilotórax. A. Dominante.
3. **Síndrome Microcefalia-Linfedema-Displasia retina:** Moderada-severa afectación neurológica. Linfedema "en bota" al nacer. A. dominante. Gen: *KIF1*
4. **Síndrome Distiquiasis-Linfedema:** Linfedema en m. inferiores + doble línea de pestañas. A. Dominante. Gen: *FOX2*
5. **Síndrome de Hennekam:** Linfedema en piernas, linfangiectasia intestinal, facies especial. Gen: *CCBE1*. A. recesiva (25% riesgo transmisión a nuevos hijos/as de los padres de un afecto)
6. **Síndrome uñas amarillas ("yellow nail"):** Linfedema tardío (>20 años) pero algunos al nacer. Uñas amarillentas, decoloradas. Bronquiectasias. Variabilidad intrafamiliar. Gen: *FOXC2*. A. dominante
7. **Síndrome Colestasis-Linfedema (s. de Aagenes):** Colestasis suele ser precoz (R. Nacido) y linfedema más tardío. Localizado en cromosoma 15q (No gen identificado aun)

LINFEDEMA: MÉTODOS DE MEDICIÓN

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Se hace una revisión de los métodos clínicos de medición de linfedema. La consistencia, mediante tonometría, la cantidad de fluido tisular mediante bioimpedancia o el tamaño son algunas de las características clínicas que pueden ser cuantificadas. La medida del tamaño es la más universalmente aceptada. La perimetría y el simple sumatorio de los perímetros puede servir tanto para el diagnóstico de linfedema como para la clasificación de su gravedad y para el control evolutivo. En cuanto a la cuantificación del volumen, el perómetro (o volumeter) y el método de desplazamiento de agua se disputan la calificación de método volumétrico gold-estándar. Los cálculos de volumen a partir de las medidas perimétricas se pueden realizar por el método del cilindro o del cono truncado. No existe una clara superioridad de uno sobre otro en cuanto a su exactitud y su utilidad. Se propugna un método que valore un buen número de medidas que permita valorar el miembro tanto en su conjunto como segmentariamente.

LINFOGRAFÍA ISOTÓPICA

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La linfografía isotópica no es una técnica indispensable pero es una herramienta útil en el diagnóstico diferencial del edema en miembros, ya que permite distinguir la patología linfática de las causas no linfáticas de edema^{1,2,3}.

La linfografía isotópica ha sustituido a la linfografía directa por ser un estudio más completo con una técnica menos cruenta, con escasa exposición a la radiación, y sobre todo su principal ventaja es que permite la exploración funcional del sistema linfático sin dañar al endotelio vascular linfático. Se realiza mediante la inyección subcutánea de nanocoloides marcados con tecnecio 99m (Tc-99). Los criterios de disfunción linfática incluyen: retraso o visualización asimétrica o ausente de los ganglios linfáticos regionales; presencia de actividad dérmica difusa; visualización asimétrica de vasos linfáticos o de linfáticos colaterales; interrupción de estructuras vasculares y ganglios en el sistema linfático profundo⁴.

¹ Pecking AP, et al.: *Rev Med Interne*, 2002; 23 Suppl 3: S391-7.

² Brautigam P, et al.: *Lymphology*, 1998; 31(2): 43-55.

³ Tiwari A, et al.: *Arch Surg*, 2003; 138(2): 152-61.

⁴ Szuba A, et al.: *J Nucl Med*, 2003; 44: 43-57.

VALORACIÓN DE DISCAPACIDAD EN LINFEDEMA

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La valoración que de una enfermedad podemos realizar viene determinada por el ámbito de dicha valoración.

1. En el ámbito clínico, es habitual la solicitud de reconocimiento de minusvalía. La minusvalía valora la implicación social que la discapacidad ocasiona en la vida y en las actividades diarias del paciente tras la aparición de un linfedema. No reconoce un diagnóstico, sino las limitaciones derivadas de la enfermedad. Se valora entre 0 y el 100%, según baremo recogido en las tablas AMA y RD 1971/ 1999 y contempla la posibilidad de sumar factores sociales al grado de minusvalía.
2. En el ámbito laboral, se considera la merma de la capacidad laboral que el paciente puede presentar, en base a los requerimientos del puesto de trabajo. En estos casos, se valora su capacidad residual y si le es posible continuar realizando la mayoría de las tareas fundamentales de su puesto de trabajo o sólo parte de ellas. En función de esta capacidad residual, el paciente presentará una incapacidad laboral parcial, total o absoluta. En este marco laboral, es importante determinar la contingencia que ocasiona dicha enfermedad, existiendo diferencias si se deriva de enfermedad común o de accidente laboral.
3. Cuando la aparición de un linfedema fuera consecuencia de un accidente traumático, por ej. un accidente de circulación, se trataría de un proceso de responsabilidad civil, y el sistema de valoración se regiría por el baremo recogido en el RD 8/ 2004. En este campo, es posible entrar en el ámbito penal si el linfedema fuera resultado de agresiones.
4. En el ámbito del seguro, si el paciente posee un seguro de vida que reconozca menoscabo por enfermedad, se hará una valoración según las tablas AMA, para obtener el % de menoscabo de la persona que se aplicará a su póliza para la posible indemnización.

ESCALAS DE VALORACIÓN EN LINFEDEMA

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La valoración clínica habitual del linfedema, se realiza mediante la exploración física, que incluye la inspección y palpación del miembro o la zona afecta, así como la medición de su volumen, que se compara bien con el del lado sano contralateral, o con el del mismo lado previo al desarrollo del linfedema. El indicador del volumen del miembro, es el parámetro más comúnmente empleado para valorar el impacto de los tratamientos aplicados en esta patología.

A pesar de las importantes limitaciones funcionales que se pueden producir en los pacientes afectados de un linfedema, y de sus repercusiones a nivel físico, estético y psico social, en España no disponemos de ninguna escala o instrumento específico adaptado y validado, que nos permita medir el impacto de esta enfermedad en la funcionalidad y la calidad de vida de los pacientes.

La calidad de vida relacionada con la salud es un "constructo" multidimensional, referido a las percepciones de los pacientes del impacto de la enfermedad y el tratamiento en sus funciones física, psicológica y social y su bienestar, y es crucial en la evaluación de las intervenciones y cuidados médicos. Una mejora en la calidad de vida se considera importante como primer resultado en la determinación de beneficio terapéutico. Puede por tanto usarse como indicador para valorar el impacto de actividades como el manejo de la morbilidad y la prevención de la discapacidad, en programas globales encaminados a eliminar por ejemplo la filarisis linfática. Es preciso utilizar instrumentos para valorar la calidad de vida relacionada con la salud, específicos para la enfermedad, y medir así los cambios longitudinales en la calidad de vida de los pacientes tras las intervenciones.

Las escalas genéricas de calidad de vida, están a menudo disponibles, pero en el caso del linfedema, son relativamente insensibles a los pequeños cambios clínicos de esta particular patología.

Cada día se hace más necesario por tanto, contar con herramientas específicas que nos permitan hacer una valoración completa del linfedema, y nos ayuden en el seguimiento y la medición de los resultados de los tratamientos actuales de esta enfermedad crónica.

En esta ponencia se revisarán las escalas de valoración actualmente disponibles y utilizadas en pacientes con patología linfática: escalas generales y escalas específicas tanto para la valoración del cáncer, como del estado de la piel, la funcionalidad y el edema.

EL DESARROLLO DE LA LINFOLOGÍA EN ANDALUCÍA

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El linfedema es una forma menos común de edema debido a una anomalía del sistema linfático. Se clasifica en primario (congénito) y secundario (adquirido). La causa más común en el secundario es la linfadenectomía axilar por enfermedad sistémica y/o radioterapia en cáncer de mama. Su elevada prevalencia y su impacto en la calidad de vida hace aconsejable la instauración de unidades de Rehabilitación del linfedema para una correcta atención de los pacientes que incluya la detección precoz, prevención primaria y secundaria y tratamiento eficaz con protocolos consensuados por el equipo de todos los profesionales implicados en esta patología. A pesar del conocimiento de esta necesidad el desarrollo de Unidades asistenciales para el tratamiento del linfedema en los servicios de rehabilitación de Andalucía ha sido muy variable a lo largo del tiempo. Hemos realizado un estudio para conocer cual ha sido este desarrollo pero en algunas de ellas ha sido imposible saber su inicio debido a múltiples factores (la ausencia de la/s profesionales que la pusieron en marcha y falta de registros escritos). Ante esta problemática hemos decidido describir la situación actual del tratamiento rehabilitador del linfedema en Andalucía (número de unidades de linfedema existentes y su organización).

Para la obtención de estos datos hemos realizado una encuesta combinando preguntas de respuesta múltiple y libre, autoadministrada en algunos casos y en otros realizada telefónicamente. Se consultan 46 centros sanitarios públicos de la Comunidad Autónoma Andaluza. De los 46 centros encuestados, se obtuvo respuesta de 43, de los cuales 11 poseen Unidad de Rehabilitación del linfedema. Todas las unidades están formadas únicamente por el equipo de rehabilitación, sin participación de otras especialidades, aunque en alguno de ellos otros profesionales colaboran de forma indirecta (enviando a los pacientes desde la consulta, haciendo hojas de consulta a las pacientes recién intervenidas, etc.). El 45,5% están constituidas por un médico rehabilitador y un fisioterapeuta y sólo una unidad está constituida por médico rehabilitador, fisioterapeuta y enfermería.

La coordinación es llevada a cabo por el médico rehabilitador en todas las unidades y con dedicación a tiempo parcial. Sin embargo el fisioterapeuta, en el 54,5% de las unidades posee dedicación exclusiva.

La patología consultada en el 63,6% de las unidades abarca todo tipo de linfedema.

La programación de la consulta es de una media de 4 días/mes y el seguimiento de los pacientes es semestral en el 82,8% de las unidades. El volumen de pacientes es de 15 pacientes/mes de primera vez y 32 pacientes/mes de revisión.

Con respecto al tratamiento, se aplica una media de 20 sesiones, en sala de fisioterapia específica en el 90,9% de las unidades, y se repite con una periodicidad anual en el 72,7% de los casos. Además el 100% de las unidades el tratamiento se basa en la terapia física compleja (drenaje linfático manual, presoterapia y vendaje multicapa).

LA VISIÓN DEL LINFEDEMA A TRAVÉS DEL CAPÍTULO DE FLEBOLOGÍA Y LINFOLOGÍA DE LA SEACV (SOCIEDAD ESPAÑOLA DE ANGIOLOGÍA Y CIRUGÍA VASCULAR)

Dr. VICENTE IBÁÑEZ ESQUEMBRE

Presidente del Capítulo Español de Flebología y Linfología (CEFyL) de la SEACV

Vamos a hablar de la problemática que existe en nuestro país respecto a esta dolencia y quisiera centrarlo recordando las palabras del Dr. Glovitzky: "El linfedema se desarrolla si algún proceso patológico reduce la capacidad de transporte y al mismo tiempo incrementa la carga linfática, extendiéndose a lo largo de todo el sistema linfático. Básicamente el linfedema se define como "un estado crónico y progresivo en el cual la acumulación de linfa excede a la capacidad de transporte de la misma". Es decir, se trata pues de un proceso crónico y evolutivo, lo que implica que cualquier abordaje terapéutico del mismo debe seguir esos dos condicionantes. Dentro del CEFyL se reconoció la importancia del diagnóstico precoz, del tratamiento mantenido y de la rehabilitación como pilar fundamental en este tipo de problema. Se discutieron aquellas orientaciones terapéuticas que fueran las mejores para estos pacientes: el drenaje linfático manual, la presoterapia, se iniciaron las primeras intervenciones para minimizar el problema con las anastomosis linfovenosas, que desgraciadamente se reconoció que no ofrecían, los buenos resultados que esperábamos. Conocimos, la experiencia que otros compañeros llevaban a cabo en otros países, y a la vuelta chocar con la cruda realidad de que no era tan fácil llevarlo a cabo en nuestro país. El linfedema es una patología que tiene varios perfiles y lecturas. No es igual el trato que sanitariamente tienen las mujeres portadoras de un linfedema post-mastectomía, que un linfedema post-irradiación, post-traumático o de un Flebolinfedema. La conclusión lógica pues, sería la creación de Unidades de Linfedema multidisciplinares en todas las capitales de provincia dentro del SNS, con suficientes fisioterapeutas especializados, en esta patología para planificar tanto su prevención como su tratamiento y el aprendizaje de los pacientes en vendajes y medias de compresión. Conclusión ideal, pero que veo bastante difícil de conseguir dada la situación de la sanidad española actual. El CEFyL intenta dentro de sus posibilidades, evidenciar el problema en sus congresos, hacer talleres de vendajes, cursos para fisioterapeutas, etc... Como presidente del CEFyL, tengo esperanzas de poder ver minimizado este problema y me comprometo a hacer todo lo que pueda para que la administración se conciente del problema y comience a ofrecer medios para abordarlo. Para ello junto con la SERMEF, está iniciado un Consenso sobre el Linfedema, y el CEFyL ha iniciado el primer Libro Blanco sobre la Patología Venosa y Linfática en España, dando también voz a las Asociaciones de Afectados por el Linfedema, y a los médicos rehabilitadores.

PROGRAMA EDUCATIVO: ESCUELA DE LINFEDEMA

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INTRODUCCIÓN: Diferentes autores alertan de la falta de información sobre el linfedema en mujeres intervenidas por cáncer de mama (1).

La falta de información dificulta la detección y el tratamiento precoz del linfedema que conlleva, un deterioro de la función y de la calidad de vida en estos pacientes.

Una correcta información influye positivamente en la satisfacción del paciente, en la forma de interpretar la enfermedad y afrontarla, en la adherencia terapéutica y en los resultados clínicos perseguidos.

Los Programas Educativos (PE) se apoyan sobre dos pilares fundamentales, la información y el ejercicio.

METODOLOGÍA: Charla informativa realizada por el médico rehabilitador que incluye: definición y fisiopatología del linfedema, factores de riesgo, reconocimiento precoz de los síntomas, medidas de autocuidado y prevención, medidas nutricionales, importancia del ejercicio y medidas posturales.

Coloquio tras la charla en el que intervienen los pacientes y sus familiares, el médico rehabilitador y el fisioterapeuta. Programa de ejercicios realizado por el fisioterapeuta que incluye: Respiratorios, ejercicios específicos dependiendo de la localización del linfedema y medidas posturales.

Va orientado a pacientes y familiares y se complementa con un folleto informativo.

EVIDENCIA: Existe una evidencia consistente del beneficio del ejercicio en el tratamiento del linfedema. La mayoría de estos estudios han investigado sus resultados en un ámbito institucional con la intervención de profesionales sanitarios (2).

El PE tiene como objetivo instruir al paciente en el automanejo del linfedema en el ámbito domiciliario, mediante la información y la práctica de ejercicio.

La investigación sobre PE en el linfedema es aún incipiente, con escasez trabajos pero algunos con buena calidad metodológica (3).

Gran parte de ellos ofrecen resultados beneficiosos sobre los síntomas, la calidad de vida relacionada con la salud, e incluso, la adherencia terapéutica en el linfedema.

Estos resultados pueden ser alentadores para proseguir la investigación sobre la efectividad de los PE.

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TERAPIA FISICA DESCONGESTIVA

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La terapia física descongestiva, es un conjunto de medidas terapéuticas para el tratamiento del linfedema con la finalidad de reducir y mantener el edema.

Se divide en 2 fases:

Primera fase o de Tratamiento: Tiene como objetivo movilizar el líquido del edema e iniciar la regresión de las alteraciones fibroscleróticas de los tejidos: Normas de higiene, ejercicios, drenaje linfático manual, vendaje compresivo.

Segunda fase o de Mantenimiento: El propósito es prevenir la reacumulación de líquido linfático y continuar evitando la formación de cicatrices tisulares. El tratamiento es ambulatorio: Normas de higiene, ejercicios, prendas de compresión, autovendaje, automasaje.

NORMAS DE HIGIENE: Son una serie de medidas que debemos aconsejar e informar a los pacientes para que tengan cuidados meticulosos de la piel con la finalidad de prevenir una celulitis.

CINESITERAPIA: Consiste en la movilización activa de la extremidad afecta con la finalidad de movilizar la linfa en el tejido celular subcutáneo, a través de un bombeo extrínseco sobre el sistema linfático aumentando el tono de vasos linfáticos y vasculares. Además ayudan al paciente a recuperar la movilidad completa de la extremidad, aumenta la fuerza y resistencia; favoreciendo el drenaje de la linfa.

DRENAJE LINFÁTICO MANUAL: Es una técnica de masaje aplicada sobre la superficie de la piel, basado en el conocimiento de la anatomía y fisiología linfática, estimulando el sistema linfático para derivar la linfa hacia áreas funcionales.

VENDAJE COMPRESIVO MULTICAPA: El objetivo es mantener el efecto del drenaje linfático manual. Son vendajes formados por más de una capa, con el fin de prevenir la acumulación de fluido linfático en los tejidos. A la vez puede suavizar el tejido edematoso.

PRENDAS DE PRESOTERAPIA: Son prendas de compresión confeccionadas a medida, que ayudan a una adecuada movilización de la linfa. Se utilizan en las horas de vigilia. El de tejido puede ser plano o circular.

TRATAMIENTO DE MANTENIMIENTO

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Tras la Terapia Descongestiva de Linfedema (TDL), el objetivo de la fase de Mantenimiento es MANTENER la reducción de volumen a largo plazo. Aunque existen pocos estudios que hayan analizado la eficacia de los distintos métodos que el paciente puede utilizar, estudios prospectivos demuestran que la COMPRESIÓN, tanto en forma de prenda de compresión como los vendajes, es efectiva para reducir y/o mantener el edema (Best Practice for the Management of Lymphoedema. International consensus, 2006; Patsch H et al, Int Angiol, 2008).

- La cinesiterapia: El paciente debe realizar los ejercicios específicos para el linfedema todos los días, estos deben realizarse siempre con la prenda de compresión colocada.
- Medidas higiénicas y de prevención de complicaciones.
- Dietas: los únicos estudios sobre dietas sólo concluyen que hay que mantener un peso adecuado evitando la obesidad (Shaw C. et al., Cancer, 2007; Shaw C. et al., Cancer, 2007).
- Drenaje Linfático Manual (DLM): se emplea frecuentemente con una frecuencia variable (1 vez/semana) También se les enseña a realizar auto-DLM. Aunque el resultado paradójico del estudio de Vignes (Vignes S. et al., Support Care Cancer, 2011) fue que el fracaso del tratamiento de mantenimiento fue mayor en los pacientes que llevaban DLM de mantenimiento (sesgo?) y menor en los que llevaban la manga de día y se vendaban al menos 4 noches por semana.
- El uso diurno de las prendas de compresión es la técnica que ha demostrado ser más eficaz para el control del edema a largo plazo (Vignes S. et al., Breast Cancer Res Treat, 2007). Las prendas de compresión constituyen el eje del tratamiento del linfedema y representan uno de los principales aspectos para que los pacientes asuman un mayor control de su enfermedad. Estas prendas deben de ser adecuadas, ya que son prendas muy específicas y la toma de medidas debe llevarse a cabo por técnicos ortopédicos con experiencia, los especialistas deben de supervisar su correcta confección y colocación, evaluando la adaptación para evitar efectos secundarios nocivos sobre el paciente tales como amplitud correcta, rozaduras, presión en axila y muñeca, colocación correcta, etc.
- Los vendajes multicapas nocturnos o los vendajes nocturnos de última generación. El uso de los vendajes multicapa (o como se denomina ahora "multicomponente" según el ICC International Compression Club [Patsch H. et al., Dermatol Surg, 2008; Flour M et al., Int Wound J, 2012]) se basa en la colocación de vendas de baja elasticidad. El aprendizaje debe de estar supervisado por un fisioterapeuta experimentado ya que requiere habilidad para conseguir una presión uniforme, pero mayor en zonas distales que en las proximales y requiere la colocación de almohadillas en algunas zonas. Existen unos vendajes para uso nocturno de última aparición, su colocación es mucho más sencilla y el paciente no requiere de grandes habilidades lo que facilita la colocación, la autonomía del paciente en los autocuidados y la consecuente cumplimentación por parte de los pacientes al tratamiento.

CINESITERAPIA EN EL LINFEDEMA Y CUIDADOS DE LA PIEL

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El ejercicio en el linfedema es una parte fundamental en el tratamiento como complemento de la terapia descongestiva. Mejorando la actividad muscular se ejerce un efecto directo sobre el automatismo de los vasos linfáticos y se estimula la red linfática. Además el ejercicio activa el sistema simpático y este a su vez aumenta el tono de vasos linfáticos y venosos. Los ejercicios que se realizan son de tipo aeróbico de corta duración, sin resistencia y repetidos, con el miembro afecto de linfedema combinándolos con ejercicios respiratorios para favorecer el drenaje linfático del conducto torácico¹. Para actualizar los conocimientos sobre el tema realizamos una búsqueda bibliográfica relacionada con el ejercicio en el linfedema, tipos de ejercicio y cuando iniciarlos. Varios estudios han investigado sobre los beneficios del ejercicio en los pacientes supervivientes del cáncer de mama. Encontramos una revisión sistemática del ejercicio en pacientes con linfedema, donde se revisaron artículos publicados desde 2004 al 2010, se concluyó que un ejercicio lento y progresivo de diferentes modalidades no se asocia con el desarrollo o exacerbación del linfedema y puede ser seguro con una supervisión adecuada². Una revisión del metaanálisis realizado por McNeely et al.³, indican que un programa de ejercicios bien planificado en el postoperatorio es mejor que proporcionar simplemente un folleto con la información escrita de los consejos y ejercicios a realizar pero sin enseñanza directa ni supervisión de un fisioterapeuta. Otro estudio sobre la efectividad de la realización de una fisioterapia temprana para prevenir la aparición del linfedema⁴, concluye que puede ser una intervención efectiva en la prevención del linfedema. A nivel de los miembros inferiores, solo encontramos un estudio piloto que nos habla del levantamiento de pesas, pero los resultados no son concluyentes⁵. Es muy importante que los ejercicios se realicen con los vendajes o con las medias de compresión, según The National Lymphedema Network debido a los conocimientos actuales en fisiología, el uso de las prendas de compresión está bien justificado⁵. Se recomiendan también los ejercicios aeróbicos: la natación, la danza, la caminata vigorosa (Nordic Walking), de este tipo de marcha, según diversos estudios se pueden beneficiar estos pacientes^{6,7,8}. Un cuidado esmerado de la piel con una adecuada hidratación, es muy importante para mantener un adecuado trofismo, elasticidad e integridad son fundamentales para el manejo del linfedema.

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PRENDAS DE COMPRESIÓN

JOSE FRANCISCO ALABAU RIBES

Key words: *tricotados, clase de compresión, presión de reposo y de trabajo.*

Para poder iniciar la terapia compresiva debemos poseer un Diagnóstico. El diagnóstico debe ser inicialmente realizado mediante la exploración clínica y posteriormente confirmado por una exploración hemodinámica (palpación de pulsos, Índice tobillo brazo > 0,8, eco-doppler, etc) para confirmar o descartar otros problemas vasculares asociados en el que este contraindicada la terapia compresiva. El grado de compresión producido por todo sistema de compresión durante un periodo de tiempo viene determinado por las complejas interacciones entre cuatro factores principales:

La estructura física y las propiedades elastoméricas del sistema compresivo

Van a estar fundamentados en tres tipos de fuerza que serán la alta, media y baja elasticidad que se podrán realizar tanto con vendajes como con medias de compresión. En el caso de medias nos encontramos con dos tipos de estructura física o tejido que le va a conferir diferentes propiedades y son :el tricotado plano y circular.

Tricotado circular: IVC, Varices, Sdrme postrombóticos, edemas

- Alta y media elasticidad
- Compresión

Tricotado plano: Linfedemas

- Baja elasticidad
- Compresión + contención

El tamaño y la forma de la extremidad en la que se aplica

Tenemos que considerar que los MMII y MMSS poseen longitudes y perímetros muy dispares de unas personas a otras y que en el caso de utilización de medias no nos podemos limitar a 5 tallas (S,M,L,XL,XXL) como ofertan algunas casas comerciales; Ya que la variedad en cuanto a medidas es múltiple y se demandan gran variedad de tallas. Hay que recordar que estamos hablando de medias compresivas ajustadas terapéuticas. Otro valor será el grado o fuerza de compresión a aplicar según el trastorno a tratar y tenemos la clase I que ejerce de 18 a 21mmHg, la clase II que ejerce de 23 a 32mmHg, la clase III de 34 a 46mmHg y por último la clase IV > de 49mmHg.

Las aptitudes y la técnica de la persona que lo aplica

La aplicación de *vendajes* requieren *entrenamiento* diferente para cada sistema de compresión. No ocurre lo mismo con el uso de *medias*, con las cuales independientemente de quien las ponga llevará el mismo grado de compresión, no variando ni un mmHg su grado y efecto terapéutico indicado desde un principio por el profesional que lo prescribió. Este hecho proporcionara seguridad al paciente, familiar y profesional de que estamos aplicando siempre la misma compresión. Para la colocación de las medias existen una serie de calzadores tanto en formato metálico como en forma de calcetín de nylon.

La naturaleza de cualquier actividad física que realice el paciente



Los pacientes que están encamados requieren muy bajos niveles de presión (10-20 mmHg) para controlar la estasis venosa.



Se recomienda la compresión baja para los pacientes que están en reposo o para aquellos con una articulación del tobillo fija.



La compresión alta es más eficaz y produce efectos hemodinámicos beneficiosos en los pacientes que pueden deambular sin problemas.

Una cuestión importante es conocer los tipos de presión ejercida por los diferentes sistemas, así tenemos:

La presión de reposo es la presión constante ejercida por los vendajes cuando el individuo está en reposo. Los mayores valores se alcanzan con los vendajes o las medias de alta elasticidad.

La presión de trabajo es la presión aplicada cuando los músculos aumentan de volumen, debido a la contracción y presionan contra el vendaje aumentando la presión en los tejidos y comprimiendo los vasos sanguíneos y linfáticos. Por lo tanto, debemos concluir que la presión de trabajo es clave en la terapia descongestiva bien sea venosa, linfática o flebolinfática; que al fin y al cabo será la más terapéutica. Los mayores valores se alcanzan con los vendajes o medias de media y baja elasticidad. En reposo la presión que ejerce es muy baja sin comprometer en absoluto la circulación arterial.

MANEJO HOSPITALARIO DEL PACIENTE PLURIPATOLÓGICO

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El paciente con linfedema que precisa ingreso hospitalario suele tener una comorbilidad asociada que empeora la respuesta al tratamiento local y, por tanto, su pronóstico. A menudo, el linfedema está asociado a factores que elevan el riesgo cardiovascular del paciente como la obesidad, hipertensión arterial, dislipemia, diabetes mellitus e insuficiencia cardíaca, entre otras. Junto a ello no se debe olvidar la valoración inicial de su estado nutricional, inmunitario y circulatorio. Esta visión global del paciente con linfedema debe motivar un tratamiento integral del mismo que es necesario para el manejo adecuado del linfedema.

Existen una variedad de medidas generales tanto para minimizar el grado de edema como para entretener la tasa de progresión, como mantener el peso corporal ideal para evitar el aumento del linfedema o procurar una higiene meticulosa de la piel y uñas, para evitar puertas de entrada de infecciones como celulitis, erisipelas y linfangitis. Pero también son importantes los ajustes de la medicación del paciente y el tratamiento de otras patologías asociadas.

El tratamiento local del linfedema puede conllevar una sobrecarga de volumen y derivar en un empeoramiento de la insuficiencia cardíaca del paciente, como el caso clínico que se presenta. Del mismo modo también resulta necesario procurar la oxigenación adecuada de los tejidos afectados, controlando la posible patología respiratoria subyacente (síndrome obesidad-hipoventilación, síndrome de apnea del sueño, EPOC...).

Por último, y no por ello menos importante, el linfedema puede ocasionar morbilidad psicosocial y alterar la calidad de vida, incluyendo aspectos emocionales, funcionales, psíquicos, y sociales, que ningún facultativo debe olvidar dentro de su actitud terapéutica.

MESA REDONDA: CASOS ESPECIALES DE LINFEDEMA

LINFEDEMA GENITAL

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La afectación de los genitales puede ser de origen primario, dentro de un cuadro de linfodisplasia, o secundario a la exéresis ganglionar y RT en el tratamiento del cáncer.

Con frecuencia, no se diagnostica pero hay que preguntar al paciente ya que si progresa resulta muy discapacitante.

Entre las opciones de tratamiento, la Terapia Descongestiva con DLM y vendajes es una técnica compleja aunque consigue reducir el volumen. Las técnicas quirúrgicas con exéresis de tejidos o con técnicas supramicroquirúrgicas de reconstrucción de vías linfáticas se emplean en algunos centros. Nuevas técnicas de linfangiografía terapéutica por vía trasnodal se han mostrado eficaces en algunos casos.

LINFEDEMA DE LA MAMA

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Paciente de 50 años IQ por cáncer de mama D el 23-01-2012: Mastectomía derecha, Linfadenectomía axilar de niveles I-II; 7/15, Reconstrucción con colgajo de dorsal ancho, Estadio: mpT2pN2a. Ha recibido QT complementaria con FECx 4 c-taxol semanal x8c. Finalizó la radioterapia complementaria cadenas ganglionares el 10/9/12. En curso de tamoxifeno 20 mg/24 h vo.

Resultados: Reducción Stemmer, Reducción del dolor y la tumefacción, Persistencia del aumento de volumen.

Plan: MDL manual, TDC, Prenda de compresión.

LINFEDEMA EN EL ANCIANO

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La edad avanzada es un factor de riesgo en la aparición y gravedad del linfedema (LE), debido a su influencia en diversos factores etiopatogénicos. El diagnóstico y tratamiento del LE en pacientes con edad avanzada hace que se complique, por un lado a mayor edad, existe menos actividad y mayor debilidad muscular, por otro lado, se asocia frecuentemente, a edemas de otras causas, como insuficiencia venosa y enfermedad cardíaca, lo que hace que las respuestas al tratamiento sean peores o incluso contraindiquen algunos tipos de terapias. También se añaden otras comorbilidades propias de la edad que se deben tener en cuenta para el tratamiento, como por ejemplo, para la prescripción de prendas de compresión ya que se debe buscar un equilibrio entre la optimización del nivel de compresión y la tolerancia, así como fragilidad de la piel o dificultades para la colocación de la misma. En cualquier caso, pero especialmente a nivel geriátrico, hay que valorar el estado de salud basal del paciente, calidad de vida, situación psicosocial y económica y enfermedades coexistentes.

LINFEDEMA MALIGNO

Dr. JOSE MUÑOZ LANGA

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El linfedema ocasionado por infiltración del sistema linfático tiene unas características propias que es necesario identificar: afectación más global del miembro, extremada dureza de los tejidos, doloroso, asociado a rigidez articular e impotencia funcional. Tiene dos formas de aparición: en pacientes con enfermedad neoplásica conocida y tratada como signo de recidiva o diseminación metastásica, y como primer signo heráldico de un cáncer oculto. El paciente debe ser remitido de forma preferente al Servicio de Oncología Médica para completar el diagnóstico y valorar la indicación del tratamiento del linfedema.

El tratamiento del linfedema maligno es controvertido, pero puede realizarse en pacientes paliativos y en las ocasiones en las que el oncólogo lo autorice.

LINFEDEMA DE ORIGEN DESCONOCIDO

CAROLINA DE MIGUEL BENADIVA

El linfedema se produce como resultado de alteraciones a distintos niveles de las vías de drenaje (capilares, colectores, ganglios o troncos linfáticos principales). En ocasiones malformaciones linfáticas localizadas, que habitualmente son asintomáticas, pueden interferir en el drenaje linfático produciendo un edema localizado. El linfedema puede volverse clínicamente evidente tras un traumatismo, un proceso inflamatorio, infeccioso o tras un periodo de inmovilidad.

El edema de miembros puede aparecer por múltiples causas y puede ser difícil de diagnosticar adecuadamente. Las causas pueden ser sistémicas como la insuficiencia cardiaca congestiva, hipoalbuminemia, insuficiencia renal, síndrome nefrótico y hepatopatía avanzada, o locales como el linfedema, enfermedad venosa crónica, lipedema y trombosis venosa profunda. Si el edema es unilateral, se descartará trombosis venosa profunda, síndrome postrombótico, artritis, quiste de Baker o recidiva tumoral. En los casos bilaterales, se debe descartar enfermedades sistémicas, hipoproteinemia, hipotiroidismo o edemas provocados por medicamentos, insuficiencia venosa y lipedema.

Cuando aparece un linfedema sin causa aparente debemos realizar un diagnóstico diferencial y se emplearán pruebas diagnósticas, para conocer el origen.

- Analítica sanguínea y de orina para descartar causas sistémicas,
- Ecografía y ecodoppler: método rápido y no invasivo para el diagnóstico diferencial de todas las formas de edema no sistémico.
- La linfografía isotópica o linfogammagrafía: aporta información del estado de las vías linfáticas y ganglios, permite la exploración funcional del sistema linfático. Es útil en el diagnóstico diferencial del edema en miembros, permite distinguir la patología linfática de las causas no linfáticas y distinguir entre linfedema primario y secundario.
- La Tomografía Axial Computarizada (TAC) permite diagnosticar posibles causas de obstrucción linfática, como masas o tumores. El patrón en panal de abeja sólo aparece en el linfedema.
- La Resonancia Magnética nuclear: (RM) valora la cantidad de líquido de los tejidos. Útil en la valoración anatómica y funcional del sistema linfático.
- La linfangiografía por RM tras inyección de contraste permite observar diversos patrones anatómicos y funcionales de los ganglios y vasos linfáticos, característicos de los pacientes con linfedema.
- Las pruebas radiológicas de la cavidad abdominopélvica (TAC y RM): útiles para el estudio de las cadenas ganglionares y de las vísceras en la detección de patología tumoral o presencia de adenopatías.

En ocasiones todas las pruebas diagnósticas son negativas, por lo cual desconocemos el origen del linfedema.

LINFEDEMA Y EMBARAZO

Dra. ISABEL FORNER-CORDERO

Unidad de Linfedema Hospital Universitari i Politènic La Fe, Valencia, Spain

Con frecuencia las pacientes jóvenes, afectas de linfedema primario en miembros inferiores nos hacen esta pregunta. “¿Qué me pasaría si me quedase embarazada?”

¿Hay que desaconsejarles que tengan hijos?

La sobrecarga linfática relacionada con el embarazo explica el hecho de que el embarazo pueda desencadenar el desarrollo de un linfedema primario en casos de linfodisplasia preexistente (Földi, 2000). También se han descrito progresión de linfedema de forma irreversible tras el embarazo (Brunner, 1989). Sin embargo, según Vignes, que estudiaba de forma retrospectiva la evolución de pacientes con linfedema primario en miembros inferiores tras el embarazo, sólo sufrieron una exacerbación subjetiva de su linfedema en 11% de las gestaciones (Vignes, 2010).

Se discutirá qué recomendaciones dietéticas, deportivas y terapéuticas dar a las pacientes.

LINFEDEMA FACIAL

Dra. DOLORES MALDONADO GARRIDO

Hospital Universitario y Politécnico La Fe, Valencia, Spain

El linfedema secundario a cirugía oncológica de cabeza y cuello es el más frecuente en nuestro medio. Este linfedema asocia complicaciones específicas derivadas de la cirugía y radioterapia como son retracciones cicatriciales y fibrosis por radioterapia. Estas pueden dificultar el drenaje linfático a territorios sanos. Previo al drenaje linfático hay que suavizar y flexibilizar dichas zonas para poder realizar un drenaje linfático eficaz. El tratamiento es largo y requiere enseñanza de auto drenajes y ejercicios específicos faciales que el enfermo realiza en su domicilio. La terapia de mantenimiento se puede realizar con prendas de compresión a medida que son de difícil adaptación a las curvas y orificios faciales. Existen tanto en termoplástico como en tejido. La tolerancia de estas prendas es complicada ya que pueden interferir en actividades vitales como son la deglución, y respiración y en funciones sensoriales visión y audición. Dado que el linfedema facial empeora con el decúbito se aconseja la utilización de las prendas de compresión durante el periodo nocturno, resultando más eficaz y tolerable para el enfermo. Este tipo de pacientes asocian complicaciones específicas que debemos conocer y tratar junto al linfedema coordinados con un equipo multidisciplinar, para mejorar la calidad de vida y funcionalidad de los enfermos.

39th Congress of the European Society of Lymphology

Friday 7th June 2013 - Auditorium: Salon de Actos - H 8:30-11:10

Session 1: CLINICAL FEATURES AND DIAGNOSIS

GENETIC STUDIES IN LYMPHEDEMA

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Primary lymphedema develops clinically in different moments of life with the appearance of an edema affecting the limbs or external genitalia which tends to progress, as a malformation developing in the later stage of lymphangiogenesis. We know familial forms, where usually it is inherited as an autosomal dominant disease linked to heterozygous mutations in genes involved in lymphangiogenesis, including *VEGFR3* and *FOXC2* genes. Taking into account these familiar forms, lymphoscintigraphy studies have never been performed on subjects with inherited mutations but without clinical presentation in an exhaustive genotype-phenotype.

We already reported a clinical and genetic analysis of 52 Italian probands screened for *VEGFR3* and *FOXC2* mutations [Michelini S. et al., 2012], where we focused nine familial cases with positive molecular diagnosis (6 with mutations in *VEGFR3*; 3 in *FOXC2*). These patients and their relatives also underwent lymphoscintigraphy. In one of the nine families we identified a subject carrying a *FOXC2* heterozygous mutation, not affected by lymphedema. The same variant was detected in his daughter, who has an overt phenotype.

The lymphoscintigraphic patterns of affected patients in the same family proved to be very similar, with bilateral delay in lymphatic drainage through inguinal nodes in *FOXC2* patient without clinical manifestations. Age of onset, clinically involved limbs and evolution were considered and a genotype-phenotype correlation was observed in patients carrying the same mutations from this and previous case studies.

Lymphoscintigraphic of the normal patient with *FOXC2* mutation, but not affected by lymphedema, indicate that subjects without manifestations but carrying mutations may have silent lymphatic insufficiencies, suggesting that in late forms, subclinical disease is already present at birth and manifests only after a triggering event. Primary lymphedema should therefore be regarded as having variable clinical expression and not, as currently considered, incomplete penetrance.

Others genes are plausibly involved as major genes in the primary lymphedema phenotype and hence an experimental strategy is necessary for identify these causative genes.

SCARS AND LYMPHATICS

ELISKA O., ELISKOVA M.

Department of Anatomy, 1st Faculty of Medicine, Prague, Czech Republic

We compared the development of the new lymphatics in the different types of wounds and scars in the secondary type of the healing.

Material and methods: 1/ we evaluated lymphatics in 20 patients after surgery of the axilla 2/ in patient with venous ulcer. 3/ In 30 dogs in femoral region open wound was performed by scalpel incision of the skin and subcutaneous tissue. The wounds were not surgically sutured. 4/ In eleven dogs, lymph flow through individual lymphatic vessels proximally and distally to the scar was measured.

Methods of investigation: coloured lymphangiography, injection methods of lymphatics with India ink, clinical lymphangiography, histology and electron microscopy methods.

Results: After the surgical interruption of the lymphatics lymphedema developed. The bulk of the granulation tissue of the open wound was devoid of lymphatics. The lymphatics ended at the margin of the granulation tissue. After two weeks new lymphatic capillaries attempt to bridge the granulation tissue sprouting from the interrupted lymphatics. The wounds were completely closed in the period of one to five months and scars developed. Limited lympho-lymphatic anastomoses in the scar were established. The anastomoses traversing the scar had the diameter of capillaries and did not reach the diameter of the lymphatic collectors. This fact corresponds with the decrease of lymph flow through the scar (Eliska, Eliskova, Eur. J. Lymphology 8, N 30, 28-32, 2000). The endothelial wall of sprouting lymphatics in this period was not completely developed. In patients the different types of lymphatics traversing the scars are presented.

ESTIMATING THE SIZE OF THE PROBLEM OF CHRONIC OEDEMA IN AN URBAN POPULATION IN THE UK

Professor CHRISTINE MOFFATT CBE

Professor of Clinical Nursing, University of Nottingham, Nurse consultant, Royal Derby Hospital, Derby, United Kingdom

There is a lack of robust evidence to describe the number of patients with chronic oedema in the population. This is the second study in the population of the UK to try to estimate the prevalence of patients within the health care system using a standardised methodology. An epidemiology study to estimate the number of patients with chronic oedema and leg ulceration in the population of Derby city in the East Midlands, UK, was undertaken (pop=246,900). Case ascertainment through health professionals was supplemented by clinical assessment of Derby City residents who were hospital in-patients at the Royal Derby and London Road Community Hospitals. Community services involved in the project included: community nurses; GP practices; nursing homes and tissue viability services. Information was collated on current patients within the Lymphoedema service at Royal Derby Hospital.

In all 985 patients living in Derby City were identified with chronic oedema of greater than 3 months duration. The mean age (SD) was 68.1 (16.7) years. The prevalence of chronic oedema was 3.99/1000 in Derby City. This is three times higher than previously estimated using the same methodology. There was a strong age gradient with a prevalence of 10.31 /1,000 in those aged over 65 to 74 rising further to 28.57 in those aged over 85 years of age. Leg ulceration was present in 50% of patients identified with chronic oedema in the community or inpatient services with 31% having an ulcer for more than 5 years.

Control of swelling was poor. Of the 298 patients identified in the community or inpatient service, 200 were defined as “not controlled”, 10 fell within an “unsure” category and only 88 patients were described as ‘stable’. No treatment was being provided for 241 patients.

The specialist Lymphoedema service at Royal Derby has shown an incremental rise in patients over the last decade with an increasing number with secondary and lymphovenous disease. Six hundred and eighty eight patients (resident in Derby city) were identified within the service. Based on the standard classification of patients used in this service the largest patient group was found to have secondary lymphoedema (n=246,37%), followed by lymphovenous disease (n=169,25%). Primary lymphoedema was diagnosed amongst 80 patients (12%). An additional 60 (9%) had swelling due to venous disease, which therefore increases the lymphovenous category to over a third of the patients treated. Oedema due to advanced cancer was relatively rare with only 25 (2%) patients being identified. Obesity was a major problem with 44% classified as obese (BMI 30 - 39.9) and 25% morbidly obese (BMI >40).

AWS: NATURE AND LOCALIZATION. MRI AND US IMAGING CORRELATED WITH CLINICAL ANATOMY

Prof. OLIVIER LEDUC* PH.D., ERIC FUMIÈRE** M.D., SOPHIE BANSE* P.T., CHARLOTTE VANDERVORST* P.T. BELGIUM

* *Haute Ecole P.H. Spaak, Unité de lympho-phlébologie, Bruxelles, Belgium*

** *Hôpital Vésale, Service de Radiologie, Charleroi, Belgium*

In a precedent study, comparing the positioning of the superficial lymphatic pedicles of the upper arm with the positioning of the axillary web syndrom (AWS), the authors seem to identify the cords as being lymph vessels.

To improve the objectivation of the identification of the cords, the authors use MRI and US imaging techniques.

The cords are detected by palpation and mobilization of the upper limb in abduction and external rotation. US imaging are performed in different attitudes of the elbow.

The web is followed from distally until the axilla.

In order to obtain the best correlation between US imaging and MRI, before performing MRI, a tube, containing a gel that MRI can detect, is fixed on the skin at the level of the cords trajet. The images are performed on the limb and in the axilla.

The origin of the web is identified as being at the proximity of the localization of the adenectomy.

The origin of the cords is also identified by mean of lymphocela observation.

In this specific case we observe cords reaching the lymphocela localized in the axillary region.

The correlation between the different observations on human cadaver's specimens and the images obtained by MRI and echography gives us the opportunity to confirm the lymphatic origin of the Axillary Web Syndrome.

PATIENT: THE CENTER OF PATHOLYMPHOLOGY-PROBLEMS AND QUESTIONS

EVANGELOS P. DIMAKAKOS MD, PHD, EDA, MLD (P)

Vascular Unit of Oncology Department of 3rd Internal Clinic of the University of Athens School of Sotiria General Hospital. Athens. Greece. Lymphology Unit of AngionMedicine- Center of Vascular Diseases Athens, Greece

Keywords: *Patient, Lymphedema, Problems.*

It is a fact that the human lymphatic system has been neglected by the medical community all over the world. Lymphedema, one of the most known lymphatic diseases, can be an important problem for the patient as well as for the health system because it is a chronic situation. This chronic condition consists a severe financial, social and psychological burden on the patient and his family. The fight between patient (woman) and cosmetic problems as lymphedema is bigger than the fight between patient and cancer.

Patient presents psychological problems, change dramatically his quality of life and he feels disappointment and anger with his problem. He is looking for the someone specialist and for the best treatment for him: prevention?, conservative treatment (MLD, elastic garments or bandage prevent exercises)? surgical treatment? And finally for insurances. Therapists usually give few and general advises for the problem called lymphedema.

Educational for Patients and for Physicians and the other persons as nurses, physiotherapists ecc... is necessary especially in our days They must have high knowledge about what is lymphedema. Therapists must have the ability to inform the patients: the possibility to present lymphedema, what to avoid or to pay attention in order to not present lymphedema, to give the correct advises to prevent or not to worse the lymphedema or to give the right directions for the treatment of the lymphedema. Patients and therapists must organize together lessons or meetings or national days in order to learn more things and solutions about the lymphedema.

Patient is going to have lymphedema all his life. He supports his hopes on the specialist and so we have to be experts of the field called Lymphology. He needs the specialist, as professionals of health and we must support him and to give him the correct solutions and treatments for his disease Moreover, it is his right and he must demand to learn how to make the treatment himself. Teaching centers are necessary for the correct and high level of communication between physicians and patient. Additional, we need more centers with the real team of lymphologists and that centers must be approved by ESL.

O1- LYMPHEDEMA PREDICTOR FACTORS AFTER BREAST CANCER SURGERY, A SURVIVAL ANALYSIS

SANDRA MONLEON, CRISTIANE MURTA-NASCIMENTO, IRIA BASCUAS, FRANCESC MACIÀ, ESTHER DUARTE, ROSER BELMONTE
Parc de Salut Mar, Barcelona, Spain

Keywords: *Breast Neoplasms; Lymphedema; Survival Analysis; Lymph Node Excision; Therapeutics Radiotherapy*

Introduction: Factors associated with lymphedema development after breast cancer surgery are not well established.

Objectives: The goal of this study is to access the value of patient-, disease- and treatment-related factors for lymphedema development.

Method / Design: this study included 371 women with primary invasive breast cancer treated surgically between 2005 and 2009 and followed until December 2011. At each follow up visit (1, 6 and 12 months after surgery and then every year) upper limb symptoms were recorded, and upper limb and surgical area were examined. Both upper limbs circumferences were measured at seven points. Kaplan-Meier and Cox regression models for survival were applied.

Results: By the end of the follow-up period, 33.4% of women (n=124) developed lymphedema. According to volume, lymphedema at diagnosis was mild in 78.5%, moderate in 19.0% and severe in 2.5% of them. Lymphedema appeared within the first year after surgery in 83.4% of the patients. The probability of developing lymphedema within 12, 24 and 36 months post-surgery was 28.7% (95%CI 24.1-34.0%), 34.6% (95%CI 29.5-40.2%) and 38.3% (95%CI 32.8-44.3%), respectively. High stages, axillary lymph node dissection, chemotherapy, radiotherapy and postoperative seroma were predictors of lymphedema in the univariate survival analysis. However, only axillary lymph node dissection and radiotherapy maintained their significance in the multivariate model. When the analysis was restricted to patients who underwent axillary lymph node dissection, the number of nodes excised did not influence the occurrence of lymphedema. Lymphedema development was independent of age, body mass index, histological grade, cancer subtype, surgery on the dominant side, type of breast surgery, hormonal therapy and the presence of hematoma or infection after breast surgery.

Conclusions: Axillary lymph node dissection and radiotherapy affected lymphedema development. This study provides support that some factors may be used as predictors of lymphedema for breast cancer survivors.

O2- STAGING LYMPH EDEMA BY MEANS OF ECHOGRAPHY IMAGING: SUBJECTIVE IMAGE EVALUATION, ECHODENSITY ANALYSIS AND ACOUSTIC STRUCTURE QUANTIFICATION

AN TASSENOY, TIM VANDERHASSELT, RONALD BUYL, JAN LAMOTE, PIERRE LIEVENS

Vrije Universiteit Brussel, Brussels, Belgium

Keywords: *postmastectomy lymphedema, staging edema, echographic imaging.*

Introduction: Postmastectomy lymph edema is a common and disabling complication caused by surgery and radiotherapy for breast cancer. Left untreated, lymphedema evolves from a subclinical stage, to an acute stage, dominated by fluid to finally end up in a chronic stage with tissue fibrosis and adipose tissue accumulation. Accurate staging is important for optimal treatment and preventing the edema of getting worse. Echography is cheap and easily feasible but results are operator dependent. Acoustic Structure Quantification (ASQ) is a tool of Toshiba which makes it possible to quantify tissue fibrosis, based on raw data of the images, making analysis less operator dependent. This technique is standardized for diagnosis of liver fibrosis. **Objectives:** The aim of the study was to evaluate different stages of lymph edema on echographic images by means of histogram analysis, subjective evaluation of tissue changes and ASQ evaluation. **Method:** Inter and intra-rater reliability of the ASQ procedure was first tested on healthy subjects. Breast cancer patients were recruited at the breast clinic of the UZBrussels. Arm volume was determined by means of perometry. Four echographic images were made on edema and non-edema arm. Subcutaneous tissue changes on these images were evaluated subjectively by the examiner, echodensity was calculated by means of an histogram and ASQ analyses were made with Toshiba software. **Results:** Inter- and intra-rater reliability was high in both control and patient group. Depending on arm volume difference of both arms, a significant difference was found in ASQ value and mean echodensity of the edema arm between the three groups (<5%, 5-10% and >5% volume difference). Subjective staging based on the images (no change, image dominated by fluid or by fibrosis and fat) resulted in significant different ASQ and echodensity values (Lower than normal in acute stages, higher in chronic stages). **Conclusion:** These preliminary results indicate that ASQ quantification could be a useful tool in staging edema, but further investigation is necessary.

Friday 7th June 2013 - Auditorium: Salon de Actos - H 11:30-14:00

Session 2: DIAGNOSTIC TOOLS IN LYMPHOLOGY

LYMPHOSCINTIGRAPHIC DEMONSTRATION OF THE COLLATERALISATION PATHWAYS IN EDEMAS OF THE BREAST, THE UPPER LIMBS AND THE LOWER LIMBS

Prof. Dr. PIERRE BOURGEOIS, MD, PHD

Service of Nuclear Medicine and Lymphology Unit, Institute Jules Bordet, Université Libre de Bruxelles, Brussels, Belgium

The knowledge of the lymphatic collateralisation pathways is of the utmost interest for the physicians and physical therapists who are managing and treating patients with edema at the level of the breast, of the upper limbs and of the lower limbs (either primary, or secondary). Within the framework of our presentation, we will show these lymphatic collateralisation pathways observed in these patients and as demonstrated by our lymphoscintigraphic examinations (the Phase 4 and 5 of our methodological protocol). We will report their frequencies and precise the clinical indications when these investigations have to be performed.

GROWTH, OVERGROWTH, ASYMMETRIC GROWTH. II.

Prof. CRISTOBAL PAPPENDIECK

Especialista en Cirugía Infantil y Cirugía Vascular. Angiopediatria. Grupo de Estudio y Tratamiento del Linfedema, Angiomas, Malformaciones y Síndromes Vasculares, Buenos Aires, Argentina

Segmentary and or hemicorporeal, direct or crossed, asymmetric growth, and overgrowth, is an important observation in pediatrics. Some "perfect" cases, like the Beckwith Wiedemann Syndrome, in which it is complex to establish a hyper or hypotrophy, or the Silver Russel Syndrome, and others well known, or others with dysmophies, that define the compromised side. There exists an important number of corporeal asymmetries which are not a Beckwith Wiedemann Syndrome (Hemihypertrophy, macroglossia, ear increases, hipoglucemia, exomphalos /omphalocele, umbilical hernia, increased risk of Wilms tumor and others) such as some combined angiodysplastic Syndromes, with corporeal asymmetries, because hypertrophy, and overgrowth, that includes the bones, such as the Klippel Trenaunay Weber and Savelle Syndromes, Proteo, CLOVEs, F.P.Weber, Sturge Weber, Cobb, Maffucci, some N 1 and N2 Syndromes, and with pseudohypertrophies without primary compromise of osseus tissue, like Primary Lymphedemas related to LAD I and or LAD II (lymphangio adeno dysplasias). Trunkular venous malformations, and macro or micro AV Shunts, lead, because of venous hypertension, to segmentary corporeal hypertrophies, and extratrunkular venous malformations, to hypotrophies of the bones. The Gorham Stout and or Haferkamp Syndrome is the onliest Lymphatic malformation which involves bones - the Phantom Bone Disease or Bone Disappearing Syndrome, with the risk of a simultaneous hem angio sarcoma. Interstitial hypertension due to lymphatic system dysplasia lead to a pseudo hypertrophy because of a hyperplasia-hypertrophy? of the regional adipose tissue. In pediatrics, the skeletal growth in Primary Lymphedema Syndromes, develops normal and symmetrically, which is a significant radiological detail, in the Grades 0 and I; in Grades II and III, develops hypertrophy because of movement with overload. The combined angiodysplastic Sydromes can be segmentary, hemicorporeal or systemic, It was not seen or described, a complete direct hemicorporeal compromise with Primary Lymphedema. This observations are important in the clinical and differential diagnosis in pediatrics, and eventually as a therapeutical resource.

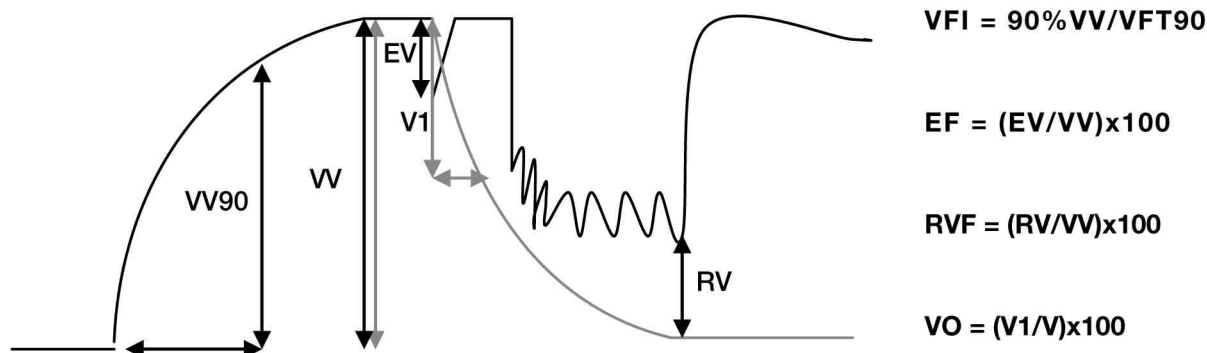
THE ROLE OF DUPLEX SCANNING IN THE DIAGNOSIS OF VENOUS DISEASE

Dr. MANUEL MIRALLES

Vascular Surgery Unit, Hospital Universitari i Politécnic La Fe, Valencia, Spain

Lymphatic disorders are usually associated with limb oedema. Under these circumstances, differential diagnosis with venous disease is mandatory. Non invasive testing, include venous plethysmography and duplex scanning.

In this presentation, basic venous physiology, based on plethysmographic data (venous filling index [VFI], outflow volume [OV], ejection fraction [EF], or reserve volume [RV]) is reviewed.



In addition, main topics related with current applications of venous duplex scanning in the diagnosis and evaluation of deep venous thrombosis and venous insufficiency/ varicose veins, including its advantages and drawbacks, are analyzed. A practical approach, based on clinical cases, demonstrative images with short video presentations is intended. This presentation is complementary of a hands-on workshop on live exams with venous duplex scanning.

NEAR INFRARED FLUOROSCOPY : AN EMERGING IMAGING TOOL IN LYMPHOLOGY. OVERVIEW OF POSSIBLE APPLICATIONS

BELGRADO J.P.*, GIACALONE G.***, BOURGEOIS P.***, VANDERMEEREN L.***, SINEGRE A.*, VALSAMIS J.B.*, DERAEMAECKER R.***, MORAINÉ J.J.*

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Key words: near infra red fluoroscopy applications, lymphology.

Background: Lymphoscintigraphy is the gold standard to study lymphatic anatomy and physiology in vivo. Recently, near infrared fluoroscopy emerged as an interesting imaging technique in the field of lymphology. After a subcutaneous injection of highly diluted Indocyanine Green, and with the help of a PDE® camera, it allows not only to observe the architecture of the superficial lymphatic network, but also the lymph propagation. Using this new tool, we obtained high quality static and dynamic images of healthy subjects and patients with lymphedema. The major advantage of this technique is the possibility to observe in real-time fluid movements from the interstitial space to the lymphatics, lymph propagation velocity, contraction rate, kinesiology of the lymphangions and substitution pathways.

Aims: We assembled various videos of lymphofluoroscopy we realized during clinical and experimental exams in order to illustrate an overview of the potentiality of lymphofluoroscopy:

- identification and characteristics of the area of dermal backflow;
- mapping of functional lymphatic pathways;
- identification of ectopic lymphnodes;
- early detection of subclinical lymphedema;
- kinesiology of the lymphangion;
- efficiency on the resorption of fluids and the acceleration of the lymph flow by using:
 - different manual lymphatic drainage techniques,
 - intermittent compression therapy,
 - multicomponent bandages.

BACK AND FORWARD IN DIAGNOSTIC AND THERAPEUTIC LYMPHANGIOGRAPHIES: LIPIODOL TRANSNODAL LYMPHANGIOGRAPHY, HIGH FREQUENCY SKIN ULTRASOUND AND MRI LYMPHANGIOGRAPHY

Dr. FERNANDO M. GÓMEZ

Servicio de Radiología Intervencionista. Hospital Universitari i Politècnic La Fe, Valencia, Spain

Classically, lipiodol lymphangiography technique after pedal dissection with lymphatic vessel cannulation has been the main tool to diagnose and stage lymphatic pathology.

With the advent of new techniques such as lymphoscintigraphy, computed tomography or magnetic resonance imaging this old technique apparently lost its interest because its risk to worsen some lower limb lymphoedemas.

However, in certain situations it can be used to diagnose lymphatic problems in the abdomen and pelvis being replaced by direct ultrasound-guided lipiodol injection in the lymphatic nodes, avoiding this way the need of affecting the lower limbs lymphatic vessels.

Indeed, in some cases with low debit in the lymphatic leaks, lipiodol lymphangiography can improve or even resolve this pathology. Computed tomography and magnetic resonance imaging lymphangiographies can be helpful in the diagnosis or procedure planning (depicting the leak or fistula, showing the relation of lymphatic and venous anatomy...) and patient follow up.

MRI lymphangiography can show the lymphatic system using the proper sequences in a completely non invasive manner.

Also, intradermic or direct nodal gadolinium injection by means of ultrasound can help to pacify the lymphatic vessels and nodes being evaluated. In a similar way, iodine contrast can be injected in similar locations allowing a similar evaluation with the classical advantages and disadvantages of CT over MRI.

CONGENITAL CHYLOUS EFFUSIONS OF THE NEONATE. A WORLDWIDE EXPERIENCE

CARLO BELLINI, MD, PHD

Medical Doctor, PhD, Gaslini Institute of Genoa, Italy

Key Word: *Congenital chylous effusion, Congenital Chylothorax, Newborn.*

In this presentation, our experience in diagnosis and treatment of Congenital Chylothorax of the Newborn is reported. Recent insights on the pathophysiology of chylous pleural effusion, the role of the lymphatic system, essentials on morphological features of the pleura and pleural liquid turnover, the structure of the pleura, the origin and structure of pleural lymphatics, and the endothelial cell plasticity are discussed.

The results of a retrospective study that was carried out at eight Neonatal Intensive Care Units (NICU) Centers worldwide on 33 newborns presenting at birth with pleural, pericardial, or abdominal chylous effusions are presented and discussed.

Diagnosis of chylous effusion was based on the findings of fluid with a milk-like appearance, a concentration of triglycerides in pleural effusion >1.1 mmol/l, and a total cell count >1,000 cells/ml with a predominance of >80% lymphocytes.

Thirty-three newborns met the inclusion criteria and were studied. Six subjects who presented at birth with fetal effusion were treated by in-utero pleuro-amniotic shunt. Five of these patients are alive at follow-up.

At birth, pleural drainage was performed in 29/33 patients and abdominal drainage was carried out in 3/33. Total parenteral nutrition (TPN) was given to 32/33 patients; 19/23 patients were fed a medium-chain triglycerides (MCT).

No adverse effects were observed. Eight patients were treated with Octreotide at dosages ranging from 1 to 7 mcg/kg/hour for 8 to 35 days. All patients showed decreased chylous production. Two patients were treated by pleurodesis. Twenty-two babies are alive after at least 6 months follow-up, 9/33 are deceased, and 2 were lost to follow-up. Clinical conditions of survivors were basically good except for lung involvement [chronic lung disease (CLD) or lung lymphangiectasia] and lymphedema.

All patients were using a MCT diet at follow-up with good control of chylous effusion. Visceral chylous effusions of the fetus and neonate are rare disorders and there currently is only partial agreement on decision-making strategies.

We suggest the need for an international prospective trial in an effort to establish the efficacy and effectiveness of diagnostic and therapeutic options we described.

Session 3: DECONGESTIVE LYMPHATIC THERAPY

O3 - CONTRIBUTION OF AN EDUCATIONAL PROGRAM TO THE MANAGEMENT AND SELF-CARE OF LYMPHEDEMA

MARTA GARCÍA MIFSUD, MARÍA JOSÉ NAVARRO COLLADO, MARÍA SOLEDAD CHUMILLAS LUJÁN, ROSA JIMENO BERNAD, RAQUEL ORTIZ HERNÁNDEZ, TERESA LIDON MEDINA

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Key Word: breast cancer, arm lymphedema, knowledge, self-care practices.

Introduction: The information about lymphedema in women after breast cancer surgery, improves self-management of lymphedema.

Objectives: Assess if an educational program (EP) improves knowledge about lymphedema, adherence to the exercises and self-care, perceived satisfaction and functionality.

Method / Design: Descriptive study of women referred to rehabilitation assessment, prevention and/or treatment of lymphedema after breast cancer surgery. All were subjected to EP. We collected socio-demographic variables and therapeutic. From at least 3 months after EP was administered a questionnaire of 17 questions, of which 16 have 4 possible answers from one (lowest) to four (maximum) and measured seven dimensions: prior knowledge of lymphedema, knowledge (theoretical and practical), EP assessment, motivation, exercise adherence, perception of the functionality of upper limb. Question 17 assesses overall satisfaction between 1 and 10.

Results: The sample consists of 39 women, mean age 58.67 ± 11.86 and predominant involvement of the right arm (66.7%). Most had subclinical lymphedema (49%). Lumpectomy predominated with 46%, and nodal excision of 100%. 92% received chemotherapy and 66% radiotherapy. 38% received complex physical therapy and 31% compression garment. Most have primary education (35%) and 44% work outside the home. Mean between the administration of the questionnaire and the educational program was 8.82 ± 4.60 months. The median score and the percentiles (25,75) of the dimensions of the survey was: prior knowledge of lymphedema 2(1,2), 3,33(3,4) theoretical knowledge, practical 3,5(3-3,5), adequacy EP 3,5(3-75), motivation 3,5(3-3,5), adhesion 3(2,5-3,5), functionality 3(2,5-3,5). The median overall satisfaction was 9(8-10). There aren't significant differences in adhesion with time elapsed between the EP and the administration of the survey.

Conclusions: Patients refer insufficient information before the EP, they improve their knowledge about lymphedema after that program. The therapy adhesion persists in the time period studied. The overall satisfaction of the educational program is high.

O4 - BREAST EDEMA FOLLOWING BREAST CONSERVING SURGERY AND RADIOTHERAPY. PRELIMINARY RESULTS

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Key Word: Breast edema, radiotherapy, tissue dielectric constant.

Introduction: Breast edema following cancer treatment is very rarely documented.

Objectives: The aim of this study was to evaluate the incidence of breast edema in patients treated with breast conserving surgery and radiotherapy (RT) and to compare axillary node dissection to sentinel node biopsy.

Method / Design: One hundred twenty patients were included and measured at start and end of RT, 2 weeks, 1, 3, 6 and 12 months post RT. Local edema in both breasts was measured with MoisturMeterD (Delfin Technologies Ltd, Finland) A parameter, tissue dielectric constant (TDC), directly proportional to tissue water content to the effective depth of 2.5 mm, was measured. Breast edema was defined as a TDC ratio exceeding 1.3 (mean + 2SD) between the irradiated and healthy breast. Patients' experience of tension, heaviness and pain in the breast was scored on a visual analogue scale (VAS).

Results: The mean TDC ratio between the treated and healthy breast at the 7 test occasions were 1.3, 1.4, 1.4, 1.4, 1.6, 1.5 and 1.4 with no difference between the axillary dissection and sentinel node biopsy except for increased tendency of axillary dissection group ($p=0.08$) at 3 months. The percentage of patients with breast edema were 41%, 57%, 50%, 56%, 72%, 80% and 54%. On the VAS score the tension during this one-year follow-up was registered in 27% to 73% of the patients, heaviness in 19% to 72% and pain in 26% to 74%.

Conclusions: Incidence of breast edema was high already before RT, increased up to 6 months but decreased at 1 year. However, the incidence of patients' experience of tension, heaviness and pain in the breast were continuously increasing. The study is on-going and the next follow-ups will be made at 2 and 3 years.

O5 - AN EASY DEVICE FOR NIGHT COMPRESSION IN THE MAINTENANCE TREATMENT OF LYMPHEDEMA

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Background: The cornerstone of maintenance treatment of lymphedema is compression therapy, but few studies have been performed in this field.

Aim: To assess the effectiveness and compliance to a new type of self-bandage for the maintenance phase of limb lymphedema.

Methods: Prospective cohort study in patients with upper (UL) and lower limb (LL) lymphedema, stages II-IV, with medical prescription of night multilayer bandages (MLB) to maintain the volume of the limb. Patients not compliant to flat-knitted compression garment during the day were excluded from the study.

Patients were provided with a FarrowWrap devices (Haddenham Healthcare Ltd) (FW) that is a Short Stretch Technology device, free of charge, to be used during the night and were assessed at baseline, 1 and 3 months.

At each time point (tx), relative-volume-change (RVC) of the treated limb was calculated using volume ratios of treated (T) to non-treated (N) side compared to baseline (t1) [$RVC = (Ttx/Ntx)/(Tt1/Nt1) - 1$]. We used a 10%-threshold of RVC to define the progression of lymphedema.

Satisfaction degree, compliance with night compression and adverse events were also recorded.

Results: Seventeen patients were included, 19 limbs (11 LL, 8 UL), the median age was 60.5 years (range: 35-79), 64.7% were secondary, 89.4% in stages III and IV. The mean of volume was in UL 3285 ml (SD:482) and in LL 13542 ml (SD:4561) at baseline. The mean of RVC at 1st month was -5.3% (95%CI:-8.2 to -2.3) and at 3rd month -8.6% (95%CI:-13.3 to -3.9).

The mean of satisfaction with MLB was 6.2 (95%CI:4.6-7.7) and with FW 8.1 (95%CI:7.9-9.5). Ninety percent of the patients evaluated as very useful both methods of night compression to maintain the volume of the limb, and also would recommend them to other patients. However, whereas 68.8% of the patients found difficult doff-and-donning MLB, only 6.3% found difficult to put on FW.

A 31.3% of the patients were able to put MLB alone and 81.3% got to put FW alone. The patients used MLB a mean of 3.9 days/week (95CI:2.1-5.6) and were compliant with FW a mean of 6.9 days/week (95CI:6.6-7.0).

Conclusion: The volume of the limb was maintained with the studied device, with a better satisfaction because of the ease of doff-and-donning providing improved compliance with night compression. Further research is needed.

Conflicts of interest: None.

O6 - LONG-TERM CONSEQUENCES ON THE QUALITY OF LIFE AND FUNCTION OF PATIENTS WEARING COMPRESSION GARMENTS IN TREATMENT OF CHRONIC UPPER LIMB LYMPHOEDEMA RELATED TO BREAST CANCER

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Introduction: Compression garments (CG) are mainstay in long term treatment of upper limb lymphoedema related to breast cancer (ULLRBC), used as single treatment or as part of the maintenance phase in physical complex therapy. Despite its widespread use in Lymphology, there are no studies that measure long-term consequences of this treatment on quality of life (QL) and function (F) of upper limb (UL).

Objectives: To compare QF and F of UL affected in patients with ULLRBC wearing versus those not wearing CG and to relate the volume of aedema with QL and F.

Design: From November 2012 to April 2013, 52 women with chronic ULLRBC were included in the study. Any patient with ipsilateral orthopedic UL pathology were excluded. Collected data: age, lymphoedema laterality, dominance, compliance in garment use, reason for rejection of garment, oedema volume measured by circumetry, generic QL scale SF36 and DASH functional UL scale. Statistical analysis was performed with a regression model for each response variable (DASH, DASH Labor, SF-36 Physical Health and Mental Health SF-36). In each of these models we compared the variables age, lymphedema volume, CG use, glove use and dominant side affected as potential predictors of QL and F.

Results: No predictor showed a statistically significant association with DASH or with SF-36 Physical and Mental Health, but some trends have been found: relationship between decrease DASH and age ($p = 0.065$), increase DASH and glove use ($p = 0.078$), increase labor DASH and glove use ($p = 0.083$) and involvement of dominant side ($p = 0.069$), decrease Mental Health as SF-36 and involvement of the dominant side ($p = 0.098$), and use of CG ($p = 0.061$). No evidence between volume and QL.

Conclusion: These features should be considered to realize clinical trial with higher power of study, with higher number of samples in order to confirm whether the trends found are real or not.

MLD AND OTHER TREATMENTS; HOW DO WE KNOW THEY ARE WORKING?

Prof. NEIL PILLER

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Key words: *Bio Impedance Spectroscopy; Dielectric Constant; Limb Volumes; Limb Composition.*

Manual lymphatic drainage has long been heralded as being a key means of removing excess extracellular fluids (and its contents) from lymphoedematous tissues. Bandaging, garments and compression pumps are indicated to reduce the outflow from the venous system and when applied in concert with exercise and movement, vary tissue pressure and facilitate increased lymphatic up take and flow. In both cases it's likely that optimal results are not obtained due to a tendency to poorly clear proximal drainage areas.

Most other treatments or management strategies we can think of work broadly similarly ways whether they be electrical stimulation of the lymphatics, hand held massage units, massage pads beds, LED or laser.

But how do we know they really move the fluids, or perhaps make a change to the composition of the lymphoedematous tissues? Traditionally, as a basic measure we have used circumference (and associated volume calculations) or plethysmography. Certainly over short time periods these are fine and accurate indicators of effectiveness, but over longer times how do we know that a limb becoming smaller is improving and a limb becoming larger is getting worse. The answer is generally we do not! Weight changes, muscle build-up or atrophy can mask actual changes in the lymphatic system function and our interpretation of treatment effect.

A range of relatively new, clinically verified and objective whole of limb and local area measures are available to assess limb changes but still are not utilized by many clinics. Techniques of Bio-impedance spectroscopy and Tissue Di-electric constants can tell us accurately about segmental or local area changes in fluids, the latter at various depths. Techniques of Tonometry and Viscoelastic indurometry can tell us about fibre and the way in which fluids between leave when pressured.

Using these, we can get an accurate objective picture of the impact of our Lymphatic Drainage Massage, our compression both in the short and longer term. We can see where the system's function has improved and where it has not. In short we can better target treatment, but importantly measure subtle changes which by other means we may not see. This talk will focus on these techniques and their benefits in providing an answer to one question (among many) of Does MLD really work?

URBAN LEGEND: ATTITUDES LIKE PHYSIOTHERAPY MAY WORSEN THE PROGNOSIS IN ADVANCED CANCER PATIENTS

Dr. ANTONIO LLOMBART-CUSSAC

Head Medical Oncology Service, Hospital Arnau Vilanova, Presidente del Grupo de Investigación SOLTI Valencia, Spain

Cancer-related lymphedema remains a challenge for health care professionals. Great efforts have been done to reduce the incidence of cancer-related lymphedema with the validation of the sentinel-node surgery and the massive use of porth-a-cat delivery systems.

Treatment of lymphedema is generally based on intensive decongestive physiotherapy followed by a long-term maintenance approach. Although objective improvements appear quickly, long term effectiveness is strongly dependent on patient's compliance and motivation. To our knowledge, there is no clinical evidence that lymphatic massage may contribute to the spread of breast cancer.

However, in patients with locally advanced breast cancer, the presence of lymphedema may be related to wide lymph node involvement and lymphatic physiotherapy may be done under the close follow-up of physicians.

Physical exercise and weight control are determinants in the control of cancer-related lymphedema. In recent years it has been highlighted a strong correlation between physical exercise and reduced risk of tumor recurrence in breast cancer. Although the relationship between low-calorie diets and lower risk of relapse for breast cancer is not so solid, the management of overweight and obesity is a basic recommendation for breast cancer patients. In fact, these two factors are changing the role of breast cancer units, reinforcing the needs for lifestyle measures including the promotion of physical activity among patients.

Lastly, physiotherapy has an important role in the palliative management of patients with advanced cancer. Although the contraindications of physiotherapy in these patients are minimal, it requires an adequate assessment by oncologists and medical rehabilitation. Lymphatic drainage is effective for edema-related pain and improves quality of life.

Improving collaboration of professionals involved in the management of patients with breast cancer is crucial. Medical rehabilitation specialist as well as physiotherapist should be incorporated to breast cancer units in order to complete patient's potentials.

O7 - "LYMPHO-TAPING" TO REDUCE HEMATOMA AFTER LIPOSUCTION: A "DOUBLE BLIND" CLINICAL RANDOMISED TRIAL, PRELIMINARY RESULTS

VANDERMEEREN L.** , BELGRADO J.P.* , PIERRE P.* , KINET J.* , HELIE C.**** , LENNE A.** , VALSAMIS J.B.* , FAILLA A.*** , MORAINÉ J.J.* , DERAEMAECCKER R.**

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Keywords: *Lymphotaping, hematoma after liposuction*

Introduction: Skin taping to reduce local edema or hematoma is worldwide and commonly used by numerous therapists. "Lympho-taping" (LT) is derived from the kinesiotape technique, announcing drainage capacity without actual demonstration of it. The frequent use of skin taping is in large contrast with the poverty of biophysical background and almost inexistence of scientific literature on the subject.

We propose our preliminary results of a prospective randomised clinical trial in which LT was used to study the post-liposuction hematomas in reconstructive surgery patients.

Material and Methods: 36 reconstructive surgery patients underwent a liposuction of the buttocks using a "superwet" technique with the aim of harvesting fat for lipofilling purposes. Patients were randomised in three groups. Only one buttock was taped using one of three different taping techniques following the study protocol. The taping was performed directly after liposuction and renewed at day 5 and 10. Progressive reduction of the hematoma was semiquantitatively evaluated by spectral analysis of pictures at day 5, 10, 15 and 30 and comparison was made between the taped and not-taped buttock.

Results: Preliminary results show in all groups faster resorption of the hematoma at the skin covered with tape. There was a significant difference in absorption between the different taping techniques used. We observed less pain and swelling in the taped areas.

Discussion: Observation of LT seems to indicate that the skin undergoes variations underneath the tape independent of the application modality. We suggest several hypotheses to explain the observed phenomenon.

Conclusion: In this randomised clinical trial, we scientifically demonstrate for the first time that LT, used in liposuction areas, can reduce postoperative pain and swelling but can also fasten hematoma resorption.

O22 - LINFOROLL: A NEW DEVICE FOR LYMPHOEDEMA TREATMENT. PRELIMINARY EXPERIENCE

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Background and aim of the study

The need to use therapeutic methods scientifically correct and reproducible led them to manufacture this equipment dedicated to the lymph drainage in which the physical parameters to be used, operator dependent, can be universally standardized. This fact in the view of compliance with the current concepts of EBM. Manual techniques commonly used today, are too subjective and operator dependent: so not universally standardized.

Linforoll consists of a roller magnetically applied to a handpiece which is connected with a computerized system containing a program that transmits in real time the pressures exerted by the roller on the same underlying tissues. The device is calibrated so that the ideal pressure to be exerted is positioned about 60 millimeters of mercury, and provides, through lighting systems of "alarm", any reduction or excess pressure that differ from those set as optimal. for each clinical case must be performed at least 10 sessions (with a variable time per session variable between 20' and 45'). At the end of the treatment is performed a multilayer bandage inelastic on the anatomical area concerned as for the traditional treatment protocols.

In the study were enrolled 86 patients suffering from primary and secondary lymphedema, 38 male and 48 female, located in the lower limbs, upper limbs, external genitals and face, both unilateral and bilateral, age ranging from 2 to 80 years old. Exclusion criteria: cardiac failure, hepatic failure, renal failure, arterial hypertension, particular psychiatric disorders to clinical judgment. Before the drainage must be carried out maneuvers 'emptying' of the lymph nodes that are encountered in the individual anatomical areas (as by manual).

The pressure exerted by the operator that rotates the roller on the skin surface of the patient must be constant. This was possible by observing the LED positioned on the handpiece, which must always coincided with a green light, throughout the maneuver rolling. During the maneuvers do not have to produce pain or redness of the skin.

The study aims to examine the volume of the anatomical region affected by edema and the tissular consistency.

The values are relevated at baseline and after 10 sessions of drainage. The volume is calculated automatically by means of a computerized processing based on the formula for the volume of a truncated cone, based on the detection of the circumferences of limbs affected by edema. The tissue texture should be detected at the same levels of the measurements of the circumferences of the limb (with the tonometer) with the foresight to detect mainly in correspondence of the anatomical areas in which clinically is more increased the local consistency.

After the treatment the Aa. Observed a medium decrease of 22% of circumference of limbs and a medium decrease of 72% of tonometric parameters.

This preliminary study testifies the effectiveness of the device and the availability according to the EBM.

Session 4: MAINTENANCE PHASE

PRESSURE TIME INTEGRAL AND EFFICACY OF COMPRESSION DEVICES

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Keywords: *compression pressure, oedema reduction, pressure time integral*

Background: The question of an optimal compression level to reduce oedema in the extremities is still not fully understood¹. After application of a compression device to a swollen extremity the pressure drops in a variable fashion, depending on underlying conditions of the treated area (configuration and consistency of the tissue), the mobility of the patient and on the properties of the material used (pressure, elasticity). The amount of pressure drop determines the time when the device needs to be renewed.

Aim: To evaluate the dose-response relationship between the pressure of a compression product and its oedema reducing effect not only by measuring the initial pressure but by calculating a pressure time integral.

Material and Methods: In order to compare the pressure time integral of different compression bandages and stockings the interface pressures of four compression devices were measured every afternoon up to one week in 40 patients with leg-oedema (CEAP C3-C6), 10 for each material: two types of inelastic bandages, a four-component system and a double compression stocking. The area under the pressure curves was calculated by summing up the daily trapezoid areas.

Pressure time integrals were also calculated from several published studies in which pressure- and volume changes of extremities had been measured before and after varying time intervals between 2 hours and one week.

Results: To obtain pressure time integrals with inelastic bandages comparable to less stiff material the initial pressure after application needs to be much higher. The dose response relationship between the pressure time integrals and percent volume reduction of the oedematous extremity showed that higher integrals showed an inverse correlation with %volume reduction demonstrating that there is an upper limit of pressure beyond which compression may be counterproductive.

Conclusion: Time pressure integral is a more meaningful parameter for characterizing the compression dose than punctual pressure values alone. This parameter may also allow a comparison between different intermittent pneumatic pumps.

¹ Partsch H., Damstra R.J., Mosti G.: *Dose finding for an optimal compression pressure to reduce chronic edema of the extremities*. *Int Angiol.*, 2011 Dec; 30(6): 527-33.

LYMQOL: A CONDITION SPECIFIC QUALITY OF LIFE TOOL FOR LIMB LYMPHOEDEMA

Prof. VAUGHAN KEELEY

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Limb volume measurements have been used routinely in the assessment of lymphoedema of the arms or legs and as treatment outcome measures. However, there are limitations associated with these, as patients sometimes feel improvements occur without a significant change in limb volume. In recent years, a number of condition specific lymphoedema quality of life (QoL) tools have been developed to address this and contribute to the assessment of people with lymphoedema and their response to treatment.

One of these, LYMQOL, was developed and validated in 209 patients in the UK. (Keeley et al., 2010). LYMQOL (arm) has 21 items and LYMQOL (leg) 22. These cover 4 domains: function, symptoms, appearance and mood, together with an "overall QoL" score.

Face and content validity were confirmed by questionnaire, criterion validity by comparison with the EORTC QLQ-C30, and internal validity by Cronbach's Alpha (0.83-0.95) and split half testing of each domain. Interestingly, in the original study there was no significant correlation between initial limb volume and LYMQOL score.

Since its publication, LYMQOL has been used in both clinical and research settings. It is available free (from vaughan.keeley@nhs.net). Users are asked to register and are invited to provide feedback to facilitate refining the tool.

To date, registered users are from 12 countries around the world and LYMQOL has been translated into Spanish, Japanese and Norwegian. It has been further validated in Japan. It is in use clinically, in audit and in research.

Reference:

Keeley V. et al.: A quality of life measure for limb lymphoedema (LYMQOL). *Journal of Lymphoedema*, 2010; 5 (1): 26-37

SKIN CHANGES IN CHRONIC LYMPHOEDEMA: CAUSES AND THERAPEUTIC CONSEQUENCES

ETELKA FÖLDI

Medical Doctor, PhD, Professor, Medical Director, Foldi Klinik, past-President of the International Society of Lymphology (ISL), Hinterzarten, Germany

THERAPEUTIC EDUCATION OF CHILDREN WITH LYMPHOEDEMA AND THEIR FAMILIES

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Constitutional lymphoedema is a rare disease that causes disabling deformities. Children may find it particularly difficult to cope with. This life-long disease has social and psychological impact on children growing up with lymphoedema and on parents and other members of the family. On the other hand, the long-term nature of lymphoedema requires a person-centred, rehabilitative approach to support self-management and maximise independence and quality of life. Such long-term therapeutic approach for children with lymphoedema should take into account all these socio-psychological and care dimensions. A pilot International Lymphoedema Framework (ILF) study was carried out with families from Canada, Sweden, Denmark and France during a one-week summer camp in order to experiment a Self-management Therapeutic Education Program for children, young adults with lymphoedema and their families. A presentation of the experiment and of the one-year results will be discussed.

Friday 7th June 2013 - Room H004 - H 16:30-18:00

Oral Communications

O8 - ADAPTIVE ABILITY OF CARDIAC LYMPHATIC VESSELS AND VEINS IN RESPONSE TO CARDIAC HYPERTROPHY

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The total cross sectional area of epicardial lymphatic vessels (CSA-ly) and that of epicardial veins (CSA-v) were measured and analysed in relation to the weights of their left ventricles (WLW).

We used human autopsied hearts whose WLW's were 70-140g as the material. Before fixation, epicardial lymphatics and veins were inflated by differential injection with solidifiable liquid media. The histological sections of the cross cut surface of the epicardium were made and photographed. The CSA-ly and CSA-v of the hearts were measured by point intercept method on the photographs. The correlation coefficient between CSA-ly and WLW (CSA-ly-LV) was 0.955 ($p < 0.01$).

In response to cardiac hypertrophy, the lymphatic system shows adaptive ability until at least the WLW reaches 140g. Although venous system responds until the WLW reaches 99g, it shows no further development with WLW more than 99g.

O9 - TREATMENT OF LYMPHEDEMA OF THE LOWER LIMBS IN PATIENTS AFFECTED BY SEVERE PERIPHERAL ARTERIAL DISEASE

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Keywords: Peripheral arterial diseases, Lymphedema of lower limbs.

Introduction: Normally compression therapy is not indicated in patients with severe peripheral arterial disease (PAD). The problem becomes serious when the PAD is associated with lymphedema of the lower limb (LLL). We thus established a protocol for treating these patients.

Method: In all patients affected by LLL we measure the ankle-brachial pressure index (ABI). When ABI is lower than 0.50 compression therapy (TC) is not indicated; revascularisation of the lower limb is attempted before treatment.

If ABI is between 0.50 and 0.55 we use microcirculatory activity: Transcutaneous oxygen tension (TcPO₂); when TcPO₂ is more than 30 mmHg the patient is treated. When TcPO₂ is between 20 and 30 mmHg, we use TcPO₂ with hanging legs and when the microcirculatory reserve is more than 40 mmHg CT is indicated.

ABI is not applied in diabetic patients with LLL, we use TcPO₂ directly and the systolic pressure index of the big toe (BTI). In PAD with significant lymphedema of the foot, we only use ABI associated with BTI (TcPO₂ gives false results).

Conclusion: This protocol allows us to treat 20 patients without significant adverse effects of compression.

O10- USE OF TAPING TECHNIQUE IN HEALING PROCESSES RELATED TO THE PRESENCE OF OEDEMA

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Taping means application on the skin of a particular adhesive tape, having peculiar characteristics, in order to achieve a draining effect. It's important to note that the taping is not impregnated and, therefore, does not release, neither substances nor drugs, but stimulates the natural healing processes. While being able to consider a bandaging technique, this new therapeutic approach gives no compression of the skin, muscles or bands and, therefore, does not limit or reduces the movement, nor hinders the physiological flow of blood and lymph. The taping plays draining effect and, at the same time, analgesic. Its effectiveness is activated by the movement, that "does wrinkle" the tape. The wrinkles, associated with the particular manner "wave" in which the glue is spread on tape, produce convolutions and induce an effect of decompression of the skin and vascular structures that are found in it, improving microcirculation and stimulating mechanoreceptors receptors contact, antagonists of nociceptors (pain receptors). The microscopic lifting of the skin produced by the tape reduces interstitial pressure and allow to the lymph to flow more freely.

The use of taping in Rehabilitation aims:

- to improve blood circulation and lymphatic drain congestion;
- to remove the accumulation of load attributable lymphatic present in the interstitial tissue;
- to reduce inflammation and the heat;
- to reduce the skin and muscle pain;
- to reduce muscle fatigue, thanks to the removal of accumulation of lactic acid and toxins present in it;
- to facilitate drainage of the hematoma;
- to soften the fibrotic areas;
- to increase the freedom of movement and the range of motion.

We applied the method to 100 pts in rehabilitation unit: 25 undergo knee prostheses replacement –20 hip prostheses replacement –5 pts leg amputees –35 pts with secondary lymphedema, upper and lower limbs –15 pts neurologically affected by stroke. All the pts were subjected to ultrasound, measuring limb compared, pain tests, articulation test to verify the degree of improvement of the rom. After treatment (1 week application) in pts was observed medium decrease of oedema of 33%, (from 18% to 67%), re-absorption of blood collection (ecchymosis) within 48 hours after application, functional recovery documented by the Rom and from the reading of the tests and early disappearance of pain. In conclusion: the method offers advantages such as: ease of application, the complete absence of contraindications, well-tolerated by the subjects. Aid to the maneuvers of lymphatic drainage and to elastic traditional compression using construction techniques of the tape to follow alternative anatomic ways. In spite of the excellent clinical significance is desirable greater scientific evidence. The technique obviously must always be performed by health care professionals and medical environment.

O11 - HOMEOSTATIC INFLAMMATION IN LYMPHEDEMA

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Keywords: Homeostatic inflammation, lymphedema.

Introduction: In metabolic syndrome gigantic fat cell has a bad penetration of oxygen and releases inflammatory cytokine such as TNF alpha inducing inflammation. Then the tissue has a better blood circulation and also an increased vascular permeability to oxygen. This is called homeostatic inflammation. Its pathophysiology shows activated Toll-like receptor 4 by saturated fatty acid with the help of danger signal inducing inflammation and further remodeling of the tissue.

Objective: To answer the question whether lymphedema has a similar inflammation or not.

Method: Lymphedema is investigated for the items mentioned in the result. Anti-inflammatory treatment is tried using unsaturated fatty acid.

Results: Lymphedema shows lymphocytic infiltration (T-cell) and lysozyme-positive macrophages in the histology, elevated ESR, Il-6, adhesion molecules as well as free fatty acid in serum. Lipoperoxide is also rich in the lymphedematous tissue. Antiinflammatory treatment by unsaturated fatty acid is effective.

Conclusion: Lymphedema is suspected to have homeostatic inflammation which makes the disease worse, although it is slowly. Unsaturated fatty acid works to decrease extremity's volume.

REFERENCE: Michiko Ito, Takayoshi Suganami and Yoshihiro Ogawa: *Metabolic syndrome and lipotoxicity*. Experimental Medicine, Vol. 30, No. 3: 418-422, 2012.

O12 - IMAGING OF LYMPH COLLECTORS AND NODES BY RMI IN LYMPHEDEMA. INTEREST FOR PHYSIOTHERAPY

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In the past different exams have been employed in case of lymphedema:

- scanner for diagnosis of compression,
- echography to show the aspect of the tissues,
- echo doppler to show vascular associated lesions,

Actually RMI allows to see anatomical approach of lymphatic vessels and nodes.

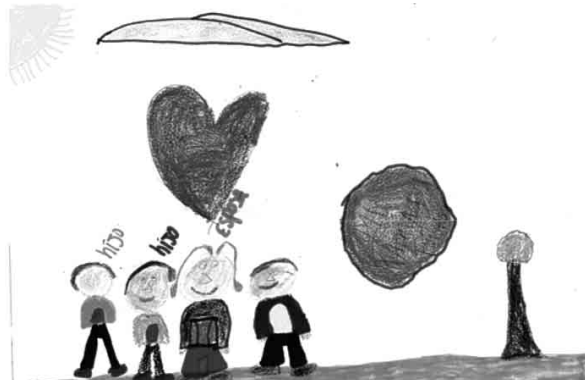
The author explains the use of RMI in case of primary or secondary upper or lower limb lymphedema. The application of manual lymphatic drainage is oriented and so seems less virtual.

O13 - PSYCHOSOCIAL INTEGRATION IN PEDIATRICS COMBINED ANGIODISPLASIC SYNDROMES

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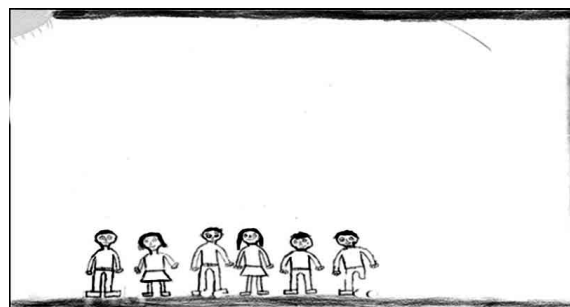
The evaluation of the psychosocial and family integration of children with combined vascular malformations such as the Klippel Trenaunay Servelle Syndrome and others, and primary Lymphedema, dominant, pathologies in our group of 102 pediatric patients. 30 of them, between 8 and 15 years, were evaluated with the Porot Test, suggesting the children to draw with full colors his family. This is a graphic projective free drawing test that explores the personality of children, and allows us to investigate many aspects of their lives. The instruction for the application is: "Draw a family, a family that you can imagine", to facilitate the projection of personal trends. Then the child explains what has drawn. The materials used for the application of the test are: pieces of papers, colored pencils, crayons and other materials that the child could use to carry out its creation. Besides these, chairs and tables were used for the appropriate age of the children (Fig. 1).

Figure 1



The picture is made in the lower section of the sheet, denoting his primordial instinct for the preservation of life. He draws the figure of what would be his ideal family model reflecting his desire to make a commitment to create his family (Fig. 2).

Figure 2



Sadness is evident for his monochromatic drawings, in which black prevails and only on the top of the sheet he uses colors to paint the sky which is a reflection of his hopes. He uses the bottom of the page and the drawings are small, which is associated with feelings of inferiority and not growing desires, his insecurity may be due to the lack of assimilation of the amputee member. Taking as a basis Porot theory, which investigates child affectivity, and its emotional values allows to see his communication with the rest of the family members, and can get to analyze dynamics in each one of the drawings, the functionality or malfunction in family relations and the mood of patients. This kind of evaluation makes possible the psychological approach as a complimentary treatment.

Keywords: psychosocial integration, angiodysplasia, combined vascular malformations, family test.

Session Oral Communications

O14 - SELECTIVE LIPOSUCTION IN FIBROSIS OF LIMB LYMPHEDEMA

BRUN J.P., BECKER C.

Paris, France

Fibrosis in lymphedema of the limb is a real problem to resolve.

A conservative treatment with manual lymphatic drainage, multilayer bandaging, exercises under bandaging and containment hosiery improves largely the skin status but sometimes is not completely effective especially in case of fibrosis.

Large liposuction is too much shattered and aggressive for the lymphatic's.

On the contrary, a selective liposuction applied gently respecting the lymphatic anatomy improves the volume of the affected limb.

The cares following a selected liposuction need to be a hard compression by bandages for 3 weeks – day and night – then new session of manual lymphatic drainage is applied.

In our experience this particular approach using selective liposuction included in the conservative treatment allow to help again our patients.

O15 - MICROSURGICAL LYMPHOVENOUS ANASTOMOSES AFTER 45 YEARS- FOLLOW-UP AND CONTEMPORARY INDICATIONS

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Keywords: Lymphovenous shunts, lymphedema, lower limbs.

Introduction: The microsurgical lympho-venous shunts have an established position in treatment of certain types of lymphedema in all parts of the world.

Objectives: Over the last 45 we performed above 1000 microsurgical lympho-venous shunts (lymphnode-vein, lymphatics-vein) in patients with lymphedema of lower limbs. The follow-up was 5 to 40 years. Evaluation methods. Improvement criteria were: decrease in limb circumference (compared to contralateral normal limb), range of movements in knee and ankle joints, no progress in hyperkeratosis, decrease in frequency of inflammation attacks.

Results: Five years results were in postsurgical group 80% (cancer survivals), 40-50% in postinflammatory, above 80% in inborn hyperplastic, and 5-10% in idiopathic. In all pts followed for 5-40 years stabilization of clinical status after initial improvement was observed. Present conditions to be met for lv shunts: (i) on lymphoscintigraphy at least one lymphatic and fragment of inguinal lymph node visualized within 3h, (ii) fast growing edema after hysterectomy or groin dissection not controlled by elastic support, (iii) hyperplastic lymphedema in children and teenagers, (iv) decompression of thigh lymph stasis before lower leg debulking.

Contraindications: (i) lack of lymphatics on lymphoscintigraphy, (ii) inflammatory changes in skin and lymphatics, (iii) idiopathic lymphedema. **Postoperative evaluation:** lymphoscintigraphy with liver scanning (time of appearance of tracer in blood circulation), subsidence of DLA attacks, lack of increase of circumference.

Conclusions: The 5-year follow-up of patients operated in the 1960- and 70-ties showed evident efficacy of microsurgical shunting. Today's evaluation is partly overshadowed by MLD, administration of long-lasting penicillin and elastic support.

O16 - OUTCOMES OF LYMPHATICOVENOUS SIDE-TO-END ANASTOMOSIS IN PATIENTS WITH BREAST CANCER RELATED LYMPHEDEMA

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Keywords: lymphaticovenous shunt, breast cancer, upper limb lymphedema, patency, side-to-end anastomosis.

Introduction: There are few reports on results of lymphaticovenous anastomosis in upper limb lymphedema. We report outcomes of lymphaticovenous side-to-end anastomosis (LVSEA) in upper limb lymphedema after breast cancer treatment.

Objectives: The aim of this study is to evaluate volume changes of the affected limbs and patency of the anastomoses.

Methods: Between 2006 and 2012 34 limbs of 34 patients who underwent pre-and postoperative CDP by one institute and LVSEA by one surgeon were evaluated. Lymphedema related to breast cancer. Volumes were calculated based on circumferential measurements at several points of the upper limb pre- and postoperatively. Moving average method was used for comparison of the volume at each period (100days). Patency of 114 anastomoses of the 34 patients was evaluated by ICG fluorescence lymphography more than 5 to 34 months (mean 9) after surgery.

(Continued on front page)

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Results: Out of 114 anastomoses 56 (49%; 56/114) were detectable. Out of 56 detectable sites 25 (38%; 25/56) were patent. The mean volume of the affected limb was 1232ml at the initial visit, 1173ml during 1 to 100 days before surgery, and 1146ml during 1 to 100 days after surgery. There was statistical difference between the mean volumes of a 100-days period before and after surgery.

Discussion: The patency rate of LVSEA in the upper limb lymphedema was similar to that in the lower limb lymphedema (Maegawa et al, JVS 2012). There are some difficulties of LVSEA in the patients with upper limb lymphedema compared with that in lower limb lymphedema, smaller size of the lymphatics, low lymph flow, and so on regardless of gravity effects.

Conclusions: LVSEA seemed to be effective to improve lymphedema in the breast cancer related patients. Further study is needed to improve patency rate in LVSEA.

O17 - LYMPHEDEMA AFTER AXILLARY LYMPH NODE DISECTION VS SENTINEL LYMPH NODE BIOPSY

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Keywords: Lymphedema, axillary dissection, sentinell node biopsy.

Introduction: In breast cancer Sentinel Lymph Node Biopsy (SLNB) is considered the gold standard technique for axillary staging. If we compare it with common Axillary Lymph Node Dissection (ALND), one of its advantages is to reduce the risk of developing lymphedema. The target of this study is to determinate the development of lymphedema in both axillary evaluation techniques.

Methods: We have managed a cross-sectional study in patients operated of breast cancer between the years 2005 to 2011 Also, we used the Kuhnke's or Mortimer's Formula to measure and classify the degree of lymphedema and the Quick Dash score (QD) has been used in order to estimate the clinical symptoms.

Results: The sample included 168 women with a mean age 54.76 years old. The following up average time was 31. 62% of the patients did not develop lymphedema. 23.4% developed mild lymphedema, 14% developed lymphedema and only 3% developed severe lymphedema. The ALND developed lymphedema more frequently than other patients ($p=0.031$). The risk of appearing lymphedema with ALND is twice more than the SLNB (OR 2.1, 95% CI 1 to 4.25). The patients with ALND who developed lymphedema in a 53.5% was level I, 25.6% level II and 15.1% level III. From the whole number of patients, around 64 were submitted to SLNB and 25.9% developed lymphedema level I. There is a significant difference between the number of sentinel lymph nodes extracts from the group which developed lymphedema regarding to the group which did not develop it: the mean of nodes removed was 2.47 and 3.56 respectively ($p=0.012$). Many of the patients (85%) with lymphedema did not develop symptoms. The QD mean value in our patients was 16.32 (ED 15.4). The QD value is significantly lower in patients who did not develop lymphedema regarding to the group which did develop it. There are no differences between QD values of women with lymphedema level I regarding to women without it. QD value increases progressively with the degree of lymphedema.

Conclusion: Although one of the advantages of SLNB is to minimize surgery complications, especially to avoid lymphedema, in our experience, one third of this group may develop lymphedema, usually, with a lower level and mild symptoms. Also, in this group, the risk of lymphedema is four times lower than ALND group, but it is not completely removed.

O18 - ARM LYMPHOEDEMA IN PATIENTS WITH SENTINEL-NODE NEGATIVE BREAST CANCER

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Keywords: lymphoedema, sentinel-node negative, breast cancer.

Introduction: Arm lymphoedema is a quite frequent complication after breast cancer treatment (21.4%). One in five women with breast cancer develops secondary lymphoedema. This is about four times more likely when axillary-lymph-node dissection is used (19.9%) compared to the more conservative sentinel-lymph-node biopsy procedure is used (4-6%).

Objectives: Our purpose is the analysis of the percentage of patients with breast cancer, who had a negative sentinel-node biopsy without additional axillary dissection and developed arm lymphoedema after three years of this surgical procedure.

Method/Design: This retrospective observational study involves a total of 66 women with a diagnosis of breast cancer when negativity of the sentinel-lymph node biopsy was confirmed during 2010. Variables: age, affected breast side, treatment (neoadjuvant chemotherapy, coadjuvant chemotherapy, radiation therapy, hormonal therapy), developing and treatment of lymphoedema, assistance to The School of Lymphoedema. Statistical analysis: SPSS.

Results: Median age was 60 years. The most affected breast side was the left one -60.3%- (29.4% right, 10.3% both). After surgery, these patients received the following treatment: 1.5% neoadjuvant chemotherapy, 48.5% coadjuvant chemotherapy, 60.3% radiation therapy and 77.9% hormonal therapy. 4.4% of our patients developed lymphoedema and received rehabilitation's treatment of lymphoedema and only 6% attended to The School of Lymphoedema.

Conclusions: We found the percentage of women with breast cancer who had sentinel-node biopsy and developed lymphoedema to be similar to that reported in the bibliography. The risk of developing arm lymphoedema decreases and quality of life increases for patients who had sentinel-lymph-node biopsy compared with patients who had axillary-lymph-node dissection. However, 4-6% of those patients will develop lymphoedema (risk factors: high body-mass index, extensive surgery, adjuvant therapy, infection, low physical activity),so prevention -through School of Lymphoedema and health recommendations- and treatment strategies are necessary to avoid this complication.

O19 - POST-MASTECTOMY PAIN SYNDROM AND SECONDARY LYMPHOEDEMA

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Keywords: Post-mastectomy pain syndrome, Lymphoedema, Therapy.

Introduction: Post-mastectomy pain syndrome (PMPS) is a condition affecting 22% to 72% of the women who have had surgery for breast cancer. Its symptoms include: burning, achy feeling around the breasts and chest, frozen shoulder that restricts range of motion at the shoulder and arms, tenderness around the area, and pain and tingling in scar tissue. PMPS is believed to be primarily caused by a neuropathic disorder associated with phantom breast pain, intercostobrachial neuralgia and neuroma pain.

Objectives: The crucial question is: Does the PMPS really exist? Or is it only result of the long-lasting insufficient lymphedema care for the patients who underwent onco-surgery treatment for breast cancer?

Method: The study analyses the health condition of 119 living patients, who have had surgery for breast carcinoma from January 1998 to January 2002, and from whom have been available complete data as at March 2009. The average time from the operation having been 8.5 years (7.2 - 10.9 years). The main emphasis during monitoring of the patients was put on the case-history, clinical examination, lymphoscintigraphy and/or sonography of the venous system and the differential diagnostics of subjective and clinical problems, which included the acute and chronic and latent stage of limb and non-limb lymphedema, WEB syndrome, neurologic disorders, post-mastectomy pain syndrome and active cicatrix.

Results: In the study there was proved statistically significant relationship between occurrence of lymphoedema and both post-mastectomy pain and mobility disorders of upper extremity and shoulder and their disappearance after lymphoedema therapy ($p=0.00002$).

Conclusions: The authors present evidence that an early diagnosis and treatment of lymphoedema, followed by a physical therapy of the musculoskeletal system when indicated, can eliminate PMPS almost completely.

O20 - THE CONCEPT OF SENTINEL LYMPHNODE: ARE WE CONFIDENT? OPENING THE REFLECTION

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The sentinel lymphnode seems to be a very interesting concept for it participates to the respect of the body with less injury and economical strategy in lymphadenectomy. We focus our discussion only in the circumstance of treating breast cancer. We deeply think that there are two very important obstacles to accredit this concept:

1. One of the most important aim is to prevent the apparition of secondary lymphedema, but this one never occurs if vicariant lymphpathways are not wounded (deltopectoral Mascagni's way, tricipital, scapular posterior). This is demonstrated!
2. The peritumoral injection depends, with evidence, of the technique of the operator, and we are not sure that the visualized node is really the first relay, for our important experience of lymph injections on corpses gave us very paradoxal results!

For all those limits, we are convinced that, although it is an interesting attitude, because it respects the body, the fundamental concept does not participate of those of Evidence Based Medicine.

O21 - THE INFLUENCE OF PREVENTIVE MICROSURGICAL LYMPH NODE TRANSPLANTATION AND LYMPH-VEIN ANASTOMOSE(S) ON THE INCIDENCE AND PROGNOSIS OF BREAST CANCER RELATED LYMPHEDEMA IN HIGH-RISK BREAST CANCER SURVIVORS

NELE ADRIAENSSENS, MOUSTAPHA HAMDI, ASSAF ZELTZER, JAN LAMOTE, PIERRE LIEVENS
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Introduction: Breast cancer related lymphedema is one of the most common complications following breast cancer treatment and can induce significant decrease in the health related quality of life of breast cancer survivors. Due to the fact that complex physical therapy does not always offer a solution, plastic surgeons developed promising microsurgical methods, resulting in a long-term reduction of breast cancer related lymphedema. **Objectives:** The main aim of this project, that started in January 2013, is to study the influence of preventive microsurgical lymph node transplantation and/or lympho-venous anastomose(s) on the incidence and prognosis of breast cancer related lymphedema in high-risk breast cancer survivors. **Method/Design:** The project is built-up by three sections to come to the main objective. The first section, section A, is a prospective study that focuses on the effects of the microsurgical breast cancer related lymphedema treatments (lymph node transplantation and/or lympho-venous anastomose(s), in combination with standard complex physical therapy, in breast cancer survivors with BCRL. In the second section, section B, breast cancer survivors with high risk for onset and development of breast cancer related lymphedema are determined. The first potential risk factor is the autonomic nervous system and the hypothalamic-pituitary-adrenal axis. The second potential risk factor is anatomic variants of the lymphatic system. In section B, retrospective designs, prospective designs and animal models are used to determine potential risk factors. The last section, section C, is a randomized clinical trial, studying the main aim of the project, as discussed in the first paragraph.

Results/Conclusions: At the congress we will discuss preliminary results of section A and B, the protocol of section C and retrospective results of section A (the influence of the intervention on quality of life in breast cancer related lymphedema patients, referring to the Thematic Area "Session 6: Surgical techniques in lymphedema").

Keywords: lymph node transplant, lymph-venous anastomoses, breast cancer related lymphedema, quality of life.

Session 5: LIPEDEMA

PATHOPHYSIOLOGY OF LIPEDEMA

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Introduction: Lipoedema is a disproportional and symmetrical obesity featuring spontaneous or palpation induced pain, spontaneous or moderate injury provoked bruising and relative unresponsiveness to diet where familial penetration and hormonal influence are also reported however the exact pathomechanism is yet to be elucidated.

Objective: We intended to study the most prominent lipoedema hallmarks and their response to decongestive lymphatic therapy (DLT) therefore were interested to see the effects of DLT+intermittent pneumatic compression (IPC) on capillary fragility (CF) (an important factor in hematoma development) and pain. We also aimed to measure arterial characteristics and lower limbs of lipoedema patients were subjected to nerve conduction studies.

Method: DLT comprised once daily manual lymph drainage, IPC at 30 mmHg pressure and multilayered short-stretch bandaging performed throughout a 5-day-course. Volume measurements were performed in accordance with Kuhnke's disc model or optoelectronic measurement, CF was evaluated upon the count of vacuum suction method (VSM) induced petechiae and pain was measured with a 10-item questionnaire, Wong Baker Faces and visual analogue scale (VAS) prior and subsequent to therapy cycles. CF was also measured in lipoedema and obese persons. Aortic stiffness (AS) and pulse wave velocity (PWV) were calculated using blood pressure measurement and transthoracic echocardiography (TTE). Nerve conduction examinations measured sensory and motoric nerve functions of lipoedematous legs.

Results: Decongestive therapy resulted in a significant reduction of limb volumes in both CDP and CDP+IPC groups, of the number of petechiae and pain severity ($p < 0.05$; respectively). VSM might be an easy-to-use tool in differentiating between non-complicated obesity and lipoedema. There were notable differences in AS and PWV between lipoedema and control groups. Lipoedematous legs showed various nerve functions.

Conclusion: Beyond marked edema reduction, CDP considerably diminishes CF and pain in lipoedematous legs. Patient and healthy groups showed apparently different aortic functions.

CLINICAL ASPECTS OF LIPEDEMA

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Lipedema is a syndrome characterized by symmetrical swelling, pain and frequent hematomas in the lower limbs and mainly affects women. It is an often misdiagnosed and poorly investigated disorder and only few publications have been devoted to Lipedema. Nevertheless, it is very common and has an immense psychological impact. Patients often feel rejected by medical staff, especially when they are stigmatized as being simply "obese".

Despite the increasing research in this disease, lipedema has not yet been included in the International Classification of Diseases (ICD) by the World Health Organization. The European Society of Lymphology has recently asked for its inclusion in the ICD. Diagnosis of lipedema is usually based on clinical features. Patients complain about swelling and pain. The clinical examination reveals symmetrical edema in the lower limbs that spares feet, with an abnormal increase of adipose tissue from the hips, involving the buttocks as well as the regions of thigh and calf. The enlargement of the lower limbs is disproportionate in relation to the upper part of the body. Patients have increased sensitivity to pain and spontaneous or minimal trauma-induced bruising due to capillary fragility. First symptoms usually appear at puberty and lipedema often affects several members of the same family. These strong familial background suggests that lipedema is a genetic disorder.

Main disorders considered for differential diagnosis are lymphedema, obesity, lipohypertrophy and phlebedema. The most significant differences between lymphedema and lipedema are:

- Lymphedema can be either uni- or bilateral, while lipedema is always bilateral.
- Lymphedema patients often present a positive Stemmer sign, whereas in pure lipedema Stemmer sign is negative, the feet are spared and the fat deposits begin abruptly above the ankles.
- Lymphedema is usually painless, whereas lipedema patients report spontaneous or even minimal pressure-induced tenderness.
- Lipoedematous skin gets easily bruised.

Early diagnosis and treatment are mandatory for this disorder otherwise gradual enlargement of fatty deposition causes impaired mobility and further co-morbidities like osteoarthritis and lymphatic insufficiency.

LIPOEDEMA- TREATMENT OPTIONS

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Lipoedema is a symmetrical disorder of distribution of fatty tissue which occurs especially in the thighs and legs and about 60% in the arms. This clinical picture also includes the accumulation of water (oedema), which usually forms in the second half of the day and is accompanied by painful tension and tenderness to pressure and touch.

Non invasive therapy: Therapy today has consisted of decongestive lymphatic treatment (DLT) with skin care, lymphatic drainage, wearing compression garments and exercises. However, with a few exceptions, only modest reductions in circumference up to 12% volume reduction were achieved, pain was relieved and, with intensive compliance in the conservative therapy, progression of the disease was prevented.

Invasive therapy: If the lipoedema is already further advanced, gentle liposuction is a logical step in definitive therapy. With this method, the fatty pads are saturated and softened with a tumescence fluid (Klein solution). After a short exposure time they can then be aspirated with thin vibrating cannulas.

Lympho-scientific associations have now acknowledged this therapeutic technique as a true alternative. The tenderness improves immediately, susceptibility to oedema is markedly reduced, and there is the side effect of getting a better shape of the column like legs. Like all operations on the human body, liposuction in lipoedema is not completely without risks and side effects. However this can be considerably reduced.

Nevertheless, the patients have to keep on with changing of nutrition, because about 30% are taking on more weight after operation and the fat cells start to grow again. Liposuction reduces the number of the cells.

Summary: In both therapy methods, invasive and non invasive, the changing of nutrition is the most important step for better health and dealing with lipoedema.

O23 - TONOMETRY IN MEASURING EFFECTIVENESS OF CONSERVATIVE COMBINED TREATMENT IN LIPEDEMA PATIENTS

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Lipedema is a chronic disease that results in symmetrical impairment of fatty tissue distribution with additional oedema formation, particularly in advanced stages. Pitting oedema is the result of additional oedema and it represents a displacement of extra cellular fluid, that can be assessed by tonometry. In this illness traditional conservative treatments combine compression therapy, manual lymphatic drainage, and diet modification. The main goal of these conservative treatment is the reduction of the additional edema formation and of pain. Aim of the study was to evaluate effectiveness of these treatments in reducing swelling of the legs, with reduction of values of tonometry, such as compressibility of tissues. 15 women affected by a II stage lipedema underwent 10 sessions of treatment addressed to the fatty tissue of the legs, twice a week. Leg measurements, VAS pain scale and tonometry were performed before and after treatment. The results showed a reduction of leg measurements (of 0,8 cm of circumference) and of compressibility of tissues (values from 0,9 to 0,4). Average values of VAS pain scale showed significant reduction after treatment of 2,8 points. The results confirmed the presence of additional oedema in lipedema patients and its importance in pathogenesis of symptoms, since with the displacement of oedema with conservative treatment we observed an improvement in clinical aspects.

Session 6: SURGICAL TECHNIQUES IN LYMPHEDEMA

PRESENT ROLE AND EFFECTIVENESS OF DERIVATIVE-RECONSTRUCTIVE LYMPHATIC MICROSURGERY FOR LIMB LYMPHEDEMA: 40 YEARS OF RESEARCH AND CLINICAL EXPERIENCE

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A wide clinical experience in General Surgery has developed a remarkable knowledge about lymphatic disorders; both primary and secondary. Diagnostic and histopathological studies of lymphatic diseases gave a better understanding of the etiological aspects and pathophysiological mechanisms responsible for the complex clinical features associated with lymphatic dysfunctions. Translational, lymphologic, basic, and clinical research has helped to improve therapeutic approaches from both the medical and surgical point of view. Thus, strategies of treatment are proposed to prevent lymphatic injuries, avoid lymphatic complications, and to treat lymphatic diseases as early as possible in order to be able to, in some cases, cure these pathologies.

Methods: The authors' wide clinical experience in the treatment of patients with peripheral lymphedema by microsurgical techniques is reported (Over 2600 cases with a follow-up of at least 5 years, to over 15 years). Derivative multiple LVA or lymphatic pathway reconstruction using interpositioned vein-grafted shunts (MLVLA) were performed at a single site, either the axillary or inguinal-crural region. Objective pre- and post-operative clinical evaluations consisted of limb volumetry, lymphoscintigraphy, and duplex scan. Patients were followed for a minimum of five years to over 20 years. Clinical outcomes included excess limb volume (ELV), frequency of dermatolymphangioadenitis (DLA) attacks, and use of conservative therapies.

Results: Over 2600 patients affected by upper and/or lower limb lymphedema, between 1983 and 2013, underwent lymphatic microsurgery. Compared to pre-operative conditions, patients obtained significant reductions in ELV of over 84% on average. Over 86% of patients with earlier stages of disease (stages IB or IIA) progressively stopped using conservative therapies and 42% of patients with later stages (stages IIB and III) decreased the frequency of physical therapies. DLA attacks considerably reduced by over 91%. Histological findings showed adverse lymphatic and lymph-nodal tissue changes in early stage lymphedemas, whilst significant fibrotic lesions were demonstrated in late stage lymphedemas.

Conclusion: Microsurgical lymphatic derivative and reconstructive techniques give positive results in the treatment of peripheral lymphedema; above all in the early stages when tissue changes are slight and allow almost a complete restoration of lymphatic drainage.

LYMPHA TECHNIQUE: FIVE YEARS FOLLOW-UP IN PRIMARY SURGICAL PREVENTION OF SECONDARY LYMPHEDEMA

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Breast cancer related lymphedema (LE) represents an important morbidity that jeopardizes breast cancer patients' quality of life. Different attempts to prevent LE brought about improvements in the incidence of the pathology but LE still represents a frequent occurrence in breast cancer survivors.

Five years ago, LYMPHA (Lymphatic Microsurgical Preventing Healing Approach) was proposed and long-term results are reported in this study.

From July 2008 to December 2012, 74 patients underwent axillary nodal dissection for breast cancer treatment together with LYMPHA procedure. Volumetry was performed preoperatively in all patients and after 1, 3, 6, 12 months and once a year. Lymphoscintigraphy was performed in 45 patients preoperatively and in 30 also postoperatively after at least over 1 year.

71 patients had no sign of lymphedema and volumetry was coincident to preoperative condition. In 4 patients lymphedema occurred after 8-12 months postoperatively. Lymphoscintigraphy showed the patency of lymphatic-venous anastomoses at 1-3 years after operation.

LYMPHA technique represents a successful surgical procedure for primary prevention of arm lymphedema in breast cancer patients.

QUALITY OF LIFE AFTER RECONSTRUCTIVE LYMPHOVASCULAR MICROSURGERY

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Quality of life assessment studies gain importance in the evaluation of treatment procedures.

In a cross-sectional study 212 patients were investigated according to the changes in quality of life, after reconstruction of an interrupted lymphovascular system via autologous lymphatic vessel transplantation. All patients had undergone at least 6 month of complex physical decongestion treatment with a mean duration of edema treatment of 7 years.

The goal of the reconstructive lymphovascular microsurgery is to bypass an interrupted lymphovascular system using the patient's own lymphatic vessels, connecting main lymphatic trunks in front and behind the interruption like performed in other vascular systems.

By that way lymphatic flow can be restored considering the normal lymphatic pressure, the specific ability of lymphatic vessels to drain the lymph and to take advantage of the low coagulability of the lymphatic fluid.

Lymphatic vessels are harvested from the ventromedial bundle without touching lymphnodes in a length up to 30 cms.

In armedemas the grafts connect ascending lymphatic vessels at the upper arm and lymphatic vessels at the neck, bypassing the axillary region.

In unilateral edemas of the lower extremities, the grafts, remaining attached at the inguinal lymphnodes are transposed to the affected leg and anastomosed with ascending lymphatic main trunks.

Quality of life was assessed using a modified standard questionnaire examining the physiological and psychological status of the patients. The results document a significant improvement in quality of live. The improved lymphatic outflow by the lymphatic vascular bypasses is assumed as responsible for the reduction in volume, increased mobility and at a great extent to the avoidance of wearing compression garments.

SIX-YEAR EXPERIENCE IN COMBINED SURGICAL TREATMENT OF LYMPHEDEMA RELATED TO BREAST CANCER

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Lymphedema is one of the most feared complications of breast cancer therapy and its treatment is a challenging problem for plastic surgeons. Although more conservative surgery has been introduced, it continues to be a prevalent iatrogenic problem that affects quality of life. In an attempt to provide breast cancer patients with an integral treatment we initiate lymphedema treatment using two surgical techniques: lymph node transplant and lympho-venous anastomosis. We present our working protocol and results.

Material and Methods: Retrospective study from January 2006 to January 2012 in 86 breast cancer patients (mean age 51.1 y) with lymphedema (levels I-IV) who underwent surgical treatment. All were studied preoperatively with lymphogammagraphy and the study was completed with ICG lymphography (Photodynamic Eye - PDE) from 2008, and also with lymph-MRI from 2009. Eight patients underwent lymph node transplant, 52 received lympho-venous anastomosis and 26 patients underwent both techniques.

Results: We clinically assessed the quality of skin tissue and the reduction of the circumference of the affected limb. After a follow up of 6 - 72 months, we observed the circumference of the arm decreased from 0,9 to 6,1 cm (average 3,25 cm). The rate of preoperative versus postoperative excess circumference decreased in range from 12 to 95,7% (average 39,72%).

Conclusion: Results are very variables and difficult to predict. They depend on many factors but the most important is the functionality of the lymphatic channels and its intraoperative identification. Treatment must thus be individualised for each patient in order to achieve optimal results.

FROM LYMPH TO FAT: THE ROLE OF LIPOSUCTION IN LYMPHEDEMA

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Key Words: fat, adipose tissue, lymphedema, liposuction.

In 1987 we noted an excess of adipose tissue in the lymphedematous tissues and recommended liposuction in order to remove the excess volume. This was questioned by several lymphologists. In recent years more and more information show that we now have clear evidence that lymphedema leads to deposition of adipose tissue. Thus we now know that patients with chronic, non-pitting, lymphedema develop large amounts of newly formed subcutaneous adipose tissue, which precludes complete limb reduction utilizing microsurgical reconstruction or conservative treatment. Although incompletely understood, this adipocyte proliferation has important pathophysiologic and therapeutic implications.

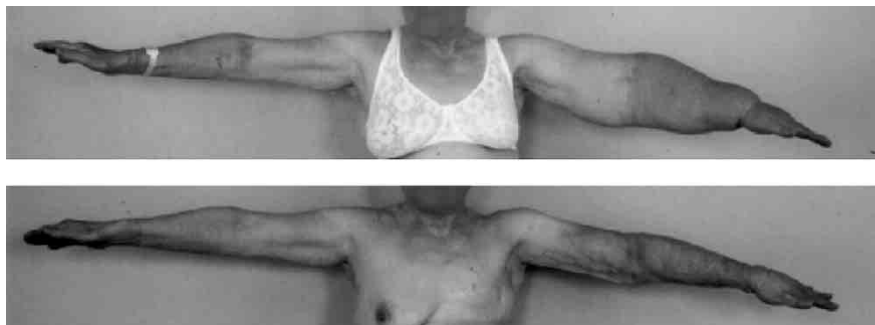
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1. The findings of increased adipose tissue in intestinal segments in patients with Crohn's disease, known as "fat wrapping", have clearly shown that inflammation plays an important role (Borley NR, Mortensen NJ, Jewell DP, Warren BF. The relationship between inflammatory and serosal connective tissue changes in ileal Crohn's disease: evidence for a possible causative link. *J Pathol*, 2000; 190: 196-202).
2. Consecutive analyzes of the content of the aspirate removed under bloodless conditions, using a tourniquet, showed a very high content of adipose tissue in 44 women (mean 90%, range: 58-100) was found (Brorson H, Åberg M, Svensson H. Chronic lymphedema and adipocyte proliferation: Clinical therapeutic implications. *Lymphology*, 2004; 37(Suppl): 153-5).
3. In Graves' ophthalmopathy a major problem is an increase in the intraorbital adipose tissue volume leading to exophthalmus. Adipocyte related IEGs (immediate early genes) are overexpressed in active ophthalmopathy and CYR61 (cysteine-rich, angiogenic inducer, 61) may have a role in both orbital inflammation and adipogenesis. (Lantz M, Vondrichova T, Parikh H, Frenander C et al. Over-expression of immediate early genes in active Graves' ophthalmopathy. *J Clin Endocrinol Metab*, 2005; 90: 4784-91).
4. A functional inactivation of a single allele of the homeobox gene Prox1 led to adult-onset obesity due to abnormal lymph leakage from mispatterned and ruptured lymphatic vessels. Prox1 heterozygous mice are a new model for adult-onset obesity and lymphatic vascular disease. (Harvey NL, Srinivasan RS, Dillard ME, Johnson NC et al. Lymphatic vascular defects promoted by Prox1 haploinsufficiency cause adult-onset obesity. *Nat Genet*, 2005; 37: 1072-81).
5. Tonometry can distinguish if a lymphedematous arm is harder or softer than the normal one. If a lower tissue tonicity value is recorded in the edematous arm, it indicates that there is accumulated lymph fluid in the tissue, and these patients are candidates for conservative treatment methods. In contrast, patients with a harder arm compared with the healthy one, have an adipose tissue excess that can successfully be removed by liposuction (Bagheri S, Ohlin K, Olsson G, Brorson H. Tissue tonometry before and after liposuction of arm lymphedema following breast cancer. *Lymphat Res Biol*, 2005; 3: 66-80).
6. Investigation with VR-CT (Volume Rendering Computer Tomography) in 8 patients also showed a significant preoperative increase of adipose tissue in the swollen arm, followed by a normalization at 3 months paralleling the complete reduction of the excess volume. (Brorson H, Ohlin K, Olsson G, Nilsson M. Adipose tissue dominates chronic arm lymphedema following breast cancer: An analysis using volume rendered CT images. *Lymphat Res Biol*, 2006; 4: 199-209)
7. Analyses with DXA in 18 women with postmastectomy arm lymphedema showed a significant increase of adipose tissue in the non-pitting swollen arm before surgery. Postoperative analyses showed normalization at 3 months. This effect was seen also at 12 months. These results paralleled the complete reduction of the excess volume ("edema volume") (Brorson H, Ohlin K, Olsson G, Karlsson MK. Breast cancer-related chronic arm lymphedema is associated with excess adipose and muscle tissue. *Lymphat Res Biol*, 2009; 7: 3-10).
8. Parathyroid hormone-like hormone (PTHrH), which can inhibit adipogenesis, is downregulated both in active and chronic ophthalmopathy, indicating the possibility of an increased risk of adipogenesis (Planck T, Parikh H, Brorson H, Mårtensson T, Åsman P, Groop L, Hallengren B, Lantz M. Gene expression in Graves' ophthalmopathy and arm lymphedema: similarities and differences. *Thyroid*, 2011; 21: 663-74).
9. Adipogenesis in response to lymphatic fluid stasis is associated with a marked mononuclear cell inflammatory response (Zampell JC, Aschen S, Weitman ES, Yan A, Elhadad S, De Brot M, Mehrara BJ. *Plast Reconstr Surg*, 2012; 129: 825-34).
10. Lymphatic fluid stasis potently up-regulates the expression of fat differentiation markers both spatially and temporally (Aschen S, Zampell JC, Elhadad S, Weitman E, De Brot M, Mehrara BJ. *Plast Reconstr Surg*, 2012; 129: 838-47).

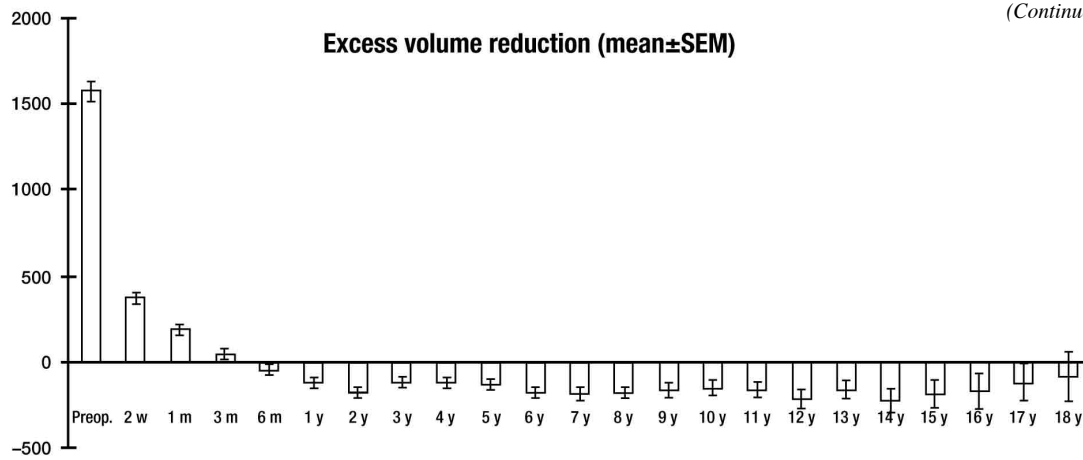
Liposuction can be performed in patients who fail to respond to conservative management or microsurgical reconstruction because the hypertrophy of the subcutaneous adipose tissue cannot be removed or reduced by these techniques.

The long-term results of liposuction for chronic large postmastectomy arm lymphedema (18 years) and primary and secondary leg lymphedema (9 years) leading to complete reduction, without recurrence, will be described.



A 74-years-old woman with a non-pitting arm lymphedema of 15 years.
Preoperative excess volume is 3090 ml and postoperative result.

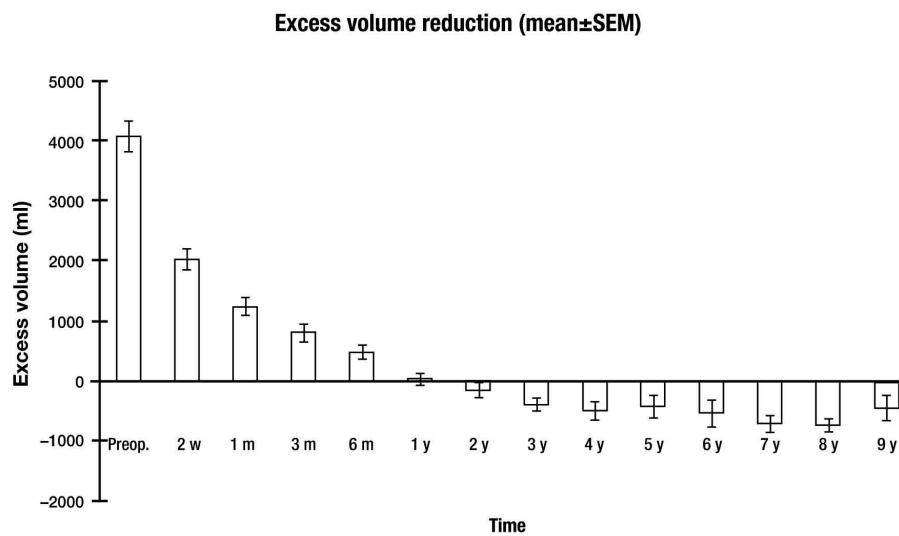
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Mean postoperative excess volume reduction in 139 patients with postmastectomy arm lymphedema.



Preop. excess volume 14 310 ml (left). Preop. excess volume 6630 ml (left).
8 years postop (right) 2 years postop (right)



Mean postoperative excess volume reduction in 48 patients with primary or secondary leg lymphedema.

WORKSHOPS

WORKSHOP 1: MANUAL LYMPHATIC DRAINAGE

Prof. Dr. ETELKA FÖLDI

Medical Doctor, PhD, Professor, Medical Director, Foldi Klinik, past-President of the International Society of Lymphology (ISL), Hinterzarten, Germany

Workshop sponsored by JOBST

Lymphoedema treatment in practice, by Prof. E. Földi

Manual Lymphatic Drainage, by Lymphotherapist Regina Englisch from Földi Klinik

Bandages, by Lymphotherapist Regina Englisch from Földi Klinik

Compression garments, by Hans von Zimmerman

WORKSHOP 2: THE CHALLENGE OF MANAGING COMPLEX CHRONIC OEDEMA

Professor CHRISTINE MOFFATT, CBE

Professor of Clinical Nursing, University of Nottingham, Nurse consultant, Royal Derby Hospital, Derby, United Kingdom

Workshop sponsored by 3M

This workshop will explore the challenges and solutions of managing complex chronic oedema. Many different patient groups suffer with chronic oedema and multiple co-morbidities. Pathological changes in the limb result in tissue changes and limb distortion that further exacerbate the problem of applying correct compression therapy. Problems of morbid obesity are a growing global challenge that impacts significantly on the suitability of compression systems. Traditional methods of bandaging rely on complex methods using many layers of bandage to correct the limb shape. This can further reduce the mobility of the patient and thus lymphatic flow. Recent advances in materials such as the Coban2 layer compression system have been designed to overcome these difficulties by producing a light, flexible system with minimal slippage. This presentation will present the complex challenges faced in every day practice and how these can be addressed. Results from a pilot RCT and observational study will also be presented.

WORKSHOP 3: CUIDADO DE LAS HERIDAS CRÓNICAS EN PACIENTE CON AFECTACIÓN LINFÁTICA

CARMEN ALBA MORATILLA

Enfermera referente de heridas en el Dep. de Salud Valencia-Clinico-Malvarrosa,

Responsable de la "Unidad Funcional de Heridas" del H. Clínico de Valencia, Spain

Introducción: El linfedema se produce, por la acumulación de líquido en los tejidos blandos del cuerpo, cuando el sistema linfático está dañado o bloqueado. Linfa está formada por plasma sanguíneo (97%) y glóbulos blancos o leucocitos (3%) La linfa se encuentra en el interior del sistema linfático, capilares, vasos, troncos y ganglios linfáticos (circulante) o impregna el espacio existente entre todas las células del organismo (Intersticial).

Objetivos: Al finalizar esta sesión el asistente deberá ser capaz de:

- 1- Diferenciar el proceso de cicatrización normal del patológico
- 2- Conocer los problemas derivados de la inflamación crónica y la actividad de MMP elevadas causada por bacterias (planctónicas y biofilm) en las heridas.
- 3- Conocer los protocolos de tratamiento y seguimiento recomendados.
- 4- Seleccionar las opciones adecuadas de dichos protocolos en función de las características de los pacientes y de las disponibilidades terapéuticas.

Descripción: El abordaje de los pacientes con heridas y afectación linfática requiere un conocimiento profundo del proceso de cicatrización y del manejo de la compresión terapéutica. Las complicaciones cutáneas que se detectan en los pacientes, son insuficientemente identificadas como consecuencia de los problemas linfáticos Celulitis/Erisipela, Linfangitis, Hiperqueratosis, Foliculitis, Infección por hongos, Linfangiectasia, Papilomatosis, Linforrea, Úlceras en la piel, Eczema venoso, Linfangiosarcoma, angiosarcoma o síndrome de Stewart- Treves, con demasiada frecuencia estos pacientes no reciben el tratamiento adecuado (compresión terapéutica) y se cronifica la lesión, incluso por años.

Independientemente de este último aspecto, la disparidad de productos tópicos que existen en el mercado, la variabilidad en sus características y la disponibilidad de los mismos, dificulta la elección del producto ideal para cada caso. En las revisiones bibliográficas¹ se recomienda, que las decisiones con respecto a qué tipo de apósito conviene aplicar deben basarse en los costos locales de los apósitos y en las preferencias de profesionales o pacientes.

Nivel: medio.

Sesión: es participativa.

1- Palfreyman SJ, Nelson EA, Lochiel R, Michaels JA Apósitos para la cicatrización de las úlceras venosas de la pierna (Revisión Cochrane traducida). En: La Biblioteca Cochrane Plus, 2008 Número 4. Oxford: Update Software Ltd. Disponible en: <http://www.update-software.com>. (Traducida de The Cochrane Library, 2008 Issue 3. Chichester, UK: John Wiley & Sons, Ltd.).

WORKSHOP 4: DIAGNOSTIC TOOLS IN LYMPHOLOGY. HERRAMIENTAS DIAGNÓSTICAS EN LINFOLOGÍA

TALLER ECO-DOPPLER VASCULAR: IGNACIO SÁNCHEZ NEVÁREZ, M^a ANTONIA SANTISO

*Servicio de Cirugía Vascular, Hospital Universitari i Politècnic La Fe, Valencia, Spain
2 Salas simultáneas, Equipos Philips HD11*

Objetivos: Conocer los principios básicos de la exploración vascular con eco-doppler, con especial énfasis en su aplicación al estudio de la patología venosa y su diagnóstico diferencial con el linfedema.

Desarrollo: 1. Ajuste de parámetros de imagen y Doppler. 2. Sistemática de exploración; maniobras de potenciación de flujo. 3. Exploración Normal. 4. Exploración patológica (paciente con edema por insuficiencia venosa)

LINFOGRAFÍA TRANSNODAL CON LIPIODOL: Dr. FERNANDO M. GÓMEZ

Servicio de Radiología Intervencionista, Hospital Universitari i Politècnic La Fe, Valencia, Spain

En esta parte del taller los objetivos serán la descripción de la linfografía transnodal con lipiodol y de la interpretación de las imágenes obtenidas mediante dicha técnica así como de sus posibles aplicaciones terapéuticas. Igualmente, describiremos las particularidades de las linfografías mediante resonancia magnética con y sin inyección de gadolinio intranodal o intradérmico y de la linfografía mediante tomografía computerizada con inyección intranodal o intradérmico de contraste yodado hidrosoluble.

LINFOGRAFÍA ISOTÓPICA: Dra. CRISTINA RUIZ-LLORCA

Servicio de Medicina Nuclear, Hospital Universitari i Politècnic La Fe, Valencia, Spain

La linfografía isotópica ha sustituido a la linfografía directa por ser un estudio más completo con una técnica menos cruenta, con escasa exposición a la radiación, y sobre todo su principal ventaja es que permite la exploración funcional del sistema linfático sin dañar al endotelio vascular linfático. Se realiza mediante la inyección subcutánea de nanocoloides marcados con tecnecio 99m (Tc-99). Los criterios de disfunción linfática incluyen: retraso o visualización asimétrica o ausente de los ganglios linfáticos regionales; presencia de actividad dérmica difusa; visualización asimétrica de vasos linfáticos o de linfáticos colaterales; interrupción de estructuras vasculares y ganglios en el sistema linfático profundo.

WORKSHOP 5: NEW SYSTEMS OF BANDAGES AND COMPRESSION GARMENTS

MARIA KUMLIEN-VALERO

Workshop sponsored by THUASNE

WORKSHOP 6: MAINTENANCE TREATMENT: NEW COMPRESSION DEVICES. INELASTIC BANDAGES IN DECONGESTIVE LYMPHATIC THERAPY

ELS. R. BROUWER, Dr. R.J. DAMSTRA

Nij Smellnghe Hospital, Drachten, The Netherlands

Key words: *adjustable compression wraps versus bandages*

Inelastic multi-component bandages are the standard of compression in the initial treatment phase of Lymphedema. The inelastic Juxta-Fit™ device (JFD), which can be easily adjusted by the patient to the circumference of the limb and was originally developed to maintain the effect of a Lymphedema treatment but not for initial treatment.

Aim: To compare the efficiency of JFD with classic short stretch bandages concerning volume reduction and interface pressure loss in the initial treatment phase.

Material and Methods: Thirty (30) hospitalized patients suffering from moderate to severe Lymphedema (stage 2-3) of the leg were randomized in two (2) groups of fifteen (15) patients each. One (1) group received the new Juxta-Fit™ device. These patients were trained by an experience nurse on how to adjust the compression themselves as soon as the patients sensed the therapeutical pressure became ineffective. The control group was treated with conventional Inelastic Multilayer Compression bandages (IMC) applied by an experienced nurse. Bandages were removed and reapplied after two (2) and after twenty-four (24) hours. Primary outcome parameters were volume reduction of the affected leg and interface pressure loss after 2 and 24 hours.

Results: A preliminary evaluation of thirteen (13) patients in each group showed a mean volume reduction after 24 hours of 11.3% in the JFD group compared to 7.3% in the IMC bandages group (n.s.). The interface pressure dropped significantly after 2 and 24 hours in the IMC group, but much less in the JFD group due to self-adjustment.

Conclusion: The JFD is very effective in the initial treatment phase compared to IMC bandages in the conventional treatment of moderate to severe Lymphedema. The possibility of self-adjustment of JFD enhances the efficacy of the clinical outcome.

POSTERS

P1 - i-Press' PNEUMATIC DRAINAGE VERSUS MANUAL DRAINAGE IN UPPER LIMB SECONDARY LYMPHOEDEMA: SAME COMPRESSION, SAME BENEFIT?

THOMAS HENNEQUART¹, MARIA E AGUILAR FERRÁNDIZ², SERGE THEYS¹, THIERRY DELTOMBE¹

¹ Cliniques Univ Godinne, Yvoir, Namur, Belgium

² Univ Jaén, Jaén, Andalucía, Spain

Key words: *lymphoedema, manual drainage, plethysmography, pressotherapy, upper limb.*

Introduction: Pressotherapy is widely used but is often said to have lesser compression yield than manual drainage in upper limb secondary lymphoedema. This idea is difficult to wipe out. One of the main complaints is to find in the anterograde mode of non professional material used or using. Since 1993, some pumps can work in a retrograde mode.

Objective: Our aim was to compare the effects of two light retrograde drainage options: a pneumatic and a manual one's.

Method: Retrograde pneumatic (a seven-compartment i-Press' 10th serial; Electronique du Mazet, France) and manual drainage is successively and randomly carried out on 9 women (71 years old) with an old (14 years) persistent upper limb lymphoedema that appeared 7 years after radio-surgical treatment against breast cancer. All volume variations are recorded continuously with a plethysmograph (JSI, SU4). Mercury gauges are fitted 4 inches (20 cm) above the elbow. The protocol of pneumatic drainage consisted of a standardised retrograde approach with constant pressure (40 mm Hg) (without regressive pressure) at a single to double-level of compression.

Results: By use of Kruskal and Wallis, one-way ANOVA on ranks, the effect of 40 mm Hg was similar (NS) when the drainage was applied manually (0.03 ml/100 ml/ed/mmHg/min) or using the pneumatic pump (0.03 ml/100 ml/ed/mmHg/min). After 15 min stopping management, improvement mainly persisted. **CONCLUSION** Whatever the technique used, there is no better edema reduction at 40 mm Hg: with the help of a same retrograde mode, light drainages give the same benefit.

P2 - PRESSOTHERAPY: INTERFACIAL PRESSION ALWAYS IN EXCESS?

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² Univ Jaén, Jaén, Andalucía, Spain

Key words: *compliance, interfacial pressure, lymphedema, pressotherapy, tonometry.*

Introduction: The main problem optimizing the conservative treatment of a resistive lymphedema is the choice of the effective compression. What has complicated the problem is that the compression value of a pneumatic pressotherapy has been presented to be in excess between cuff and the skin. This has lead to block the therapeutic pressure to low value, disregarding the compliance of the support on which the pressure is exerted.

Objective: Does the interfacial pressure varies with the compliance of the compressed element?

Method: The impact of intra-cuff pressure on the interfacial ones has been evaluated by a Kikuhime[®], TT Meditrade Aps, Denmark during a 40 mmHg cuff inflation on three cylinders that had the same diameter but a different tonometric compliance: 0, 1.1, 2.3 mm.

Results: By modifying the compliance of the compressed element, it appeared that on a firm element (tonometric compliance of 1.1 mm) the intra-alveolar pressure equalizes almost that measured in interface: 40 mm Hg = 40 mm Hg. The interfacial pressure increased (25-45%) to 50-56 mm Hg on a solid cylinder (tonometric compliance of 0 mm). It decreased (-10 to -15%) to 36-34 mm Hg on a softer cylinder (tonometric compliance of 2.3 mm).

Conclusions: It is random to choose the value of compression of a lymphedema on basis of the fear of an excess of intra-alveolar pressure. Let's walk the talk! External pressure does not always produce an excess on the skin. The compliance of the element compressed seems a dimension of very first order in an effective protocol of decongestion.

P3 - PSYCHOSOMATIC BASIS OF LYMPHEDEMA TREATMENT IN MAINTENANCE PHASE

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Medical Faculty, Masaryk University and University Hospital Brno, ARCUS onco- and lymphocentre Brno, Czech Republic

Key words: *lymphedema treatment, maintenance phase, psychosomatology.*

Introduction: Paramount problem of chronic lymphedema management seems to be patient's acceptance of long-termed complex decongestive therapy (CDT). For achieving positive outcomes patient's psychical compliance takes decisive role.

Objectives: Lymphedema causes both physical as well as psychical burden to the ill. Therefore, integrated therapy of patient's body and soul is needed. Present state of this problem is not generally respected.

Methods/Design: Since 10/2005 till 12/2012 in general 652 lymphedema patients underwent complex treatment in maintenance phase, including regular checking, educational seminars and specialized questionnaire evaluation. Collected data evoked consequential cognitions.

Results and recommendations: As decisive items in patients' management: communication, therapy acceptance, cooperation and self-treatment were identified. In clinical survey:

- (a) Communication: main goals for lymphologic staff* to evoke patients' feeling of confidence, trust and of being an integrated and self-responsible member in the team combating patients' disease; training in communication skill is needed.
- (b) Acceptance of long-term treatment: there are rational and emotional factors (positive/negative) influencing patients' attitude to CTD; identification of factors and support of positive ones is necessary.
- (c) Cooperation's prospective steps: contact? communication? cooperation? compliance? adherence. Self-treatment: must be incorporating in daily-régime (skin care, self-applied manual and pneumatic lymph drainage, self-bandaging, elevation of the limbs, appropriate sport activities, etc.; requirements: patients' information, motivation and education focused on positive changes in patients' behaviour.

Conclusion: Treatment of lymphedema in maintenance phase has to be based on psychosomatic approach to the disease integrating both somato- and psychotherapy.

P4 - EVALUATION OF PLANTAR PRESSURE IN PATIENT WITH UNILATERAL PRIMARY LYMPHEDEMA - A CASE REPORT

AKIN BASKENT¹, ISMAIL YILDIZ¹, AYSE KILIC¹, EMIN UNUVAR¹, FATMA OGUZ¹, EKIN AKALAN², YENER TEMELLI¹, SHAVKAT KUCHIMOV³, GAMZE BASKENT⁴

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Key words: *Lymphedema, plantar pressure, force.*

Introduction and Objectives: The aim of this case report is to evaluate plantar pressure scan in patient with unilateral primer lymphedema. Data obtained from a plantar pressure assessment can be used for the evaluation and management of patients with foot impairments. Lymphedema therapy includes bandages and garments. This case report describes the differences of plantar pressure of extremities with bandages, garments and barefoot.

Method/Design: The patient was a 10-years-old child with unilateral lower limb primer lymphedema. Right lower limb is affected and has a edema. There were 2cm differences on metatarsal part and dorsal foot part at the affected side than the other side for both sides at the circumferential lower extremity measurement. The patient was measured three times on standing position with bandage, barefoot and with garment. Foot scans were collected using a insole pressure scanning (Tekscan Inc, Boston, MA). Peak force (N) and peak pressure (kg/cm²) was calculated.

Results: Lymphedema is a chronic disease. The patient has to use the garment during their life. There was %11 difference for both sides for the applications with bandage and the garment. There was %6 difference with barefoot. The difference with bandages and barefoot was %9; between bandage and garment was %8; and between barefoot and garment was %1 for the affected side. These results demonstrate that the application of garment doesn't effect peak force value. The %13-14 difference between bandage and barefoot; and %8 difference bandage and garment. Demonstrate that there was pressure difference for the applications with garment and bandage to the affected side than the other side.

Conclusions: Foot pressure scanning seems that it is not sensitive enough tool to analyze the clear difference between barefoot and garment. Even though all measurements were taken in the same session, it was realized that garment application had a great superiority on bandage application. We need more clinical researches with more patient outside of only one case report.

(Continued on front page)

Table 1: Peak force (N) percentage difference in the extremities and applications.

	Left (L) extremity		Right (R) extremity lymphedema		Percentage
					R – L %
Bandage (B)	230,55± 5,59		260,13± 5,39		% 11,38
Barefoot (Bf)	269,25±16,56		288,20±10,84		% 6,58
Garment (G)	253,37±11,93		285,02±10,84		% 11,11
Percentage	B-Bf	%	% 14,38	% 9,74	
	B-G	%	% 9,01	% 8,74	
	Bf-G	%	% 5,90	% 1,11	

Table 2: Peak pressure (kg/cm²) percentage difference in the extremities and applications.

	Left (L) extremity		Right (R) extremity (lymphedema)		Percentage
					R – L %
Bandage (B)	79,39		92,04		% 13,75
Barefoot (Bf)	76,58		89,93		% 14,85
Garment (G)	80,09		87,82		% 8,81
Percentage	B-Bf	%	% 3,54	% 2,30	
	B-G	%	% 0,88	% 4,59	
	Bf-G	%	% 4,39	% 2,35	

P5 - ADAPTATION OF MULTILAYER BANDAGING TO A BREAST-FED BABY SIZE SUFFERING PRIMARY CONGENITAL LYMPHOEDEMA. A PROPOS OF A CASE

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Key words: Multilayer bandaging; Milroy disease; breast-fed baby; Complex Decongestive Therapy; adaptation.

Introduction: Mutations in FLT4, the gene coding the production of endothelial growth factor VEGF3, cause primary congenital lymphoedema, also known as Milroy disease. Milroy disease is an autosomal dominant condition, with incomplete penetrance and variable expression. The main sign is edema in feet, extending to toes and shins.

Objectives: This case describes how multilayer bandage is adapted to the leg size of a breast-fed baby, suffering hereditary lymphoedema, being part of the Complex Decongestive Therapy and its effects on the edema.

Material and Methods: A multilayer banding was applied to a 1 month old baby, displaying edema Stage II (2009 International Society Lymphology consensus) at birth in feet and toes with upslating nails, positive pitting in right leg and dorsal side of the feet and positive Stemmer sign in toes. A tape measure was used to measure both limbs, including the dorsal side of the feet. At baseline, a small difference of 0.5 cm between both legs was observed, with both feet being similar in size. Treatment with manual lymphatic drainage and multilayer bandaging using short elasticity bandages was performed by adapting the material to the limb size.

Results: A reduction of 0.5 cm in right leg edema and absence of pitting were observed after the second session. The foot dorsal side edema was progressively reduced by approximately 0.5 cm after the 10th session. After 3 months, no evidence of pitting was observed in the dorsal side of feet.

Conclusions: The multilayer bandaging therapy used as a treatment of lymphoedema in breast-fed babies, despite the difficulty in its application due to the small size of the limbs, is of importance in reducing of edema volume and consistence, as described in this case.

P6 - BRACHIAL PLEXOPATHY AND LYMPHOEDEMA: A CASE REPORT

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Key words: Breast cancer, brachial plexopathy, lymphoedema, neoplastic infiltration.

Introduction: Brachial plexopathy in breast cancer is associated with tumour infiltration or injury caused by radiation therapy. Some of the neurological manifestations are hypesthesia, hypalgesia, dysaesthesia, paresis, hyporeflexia and muscular atrophy. Brachial plexopathy is often associated with arm oedema and may worsen the symptoms of lymphoedema due to limited mobility. In addition to this, the substantial increase in the volume and weight of the affected upper limb may cause excessive stretching of the brachial plexus.

Objectives: To assess the benefits of decongestive physical therapy in patients with tumour infiltration who develop severe lymphoedema and brachial plexopathy.

Method/Design: We report the case of a patient who underwent breast cancer surgery and developed lymphoedema and brachial plexopathy secondary to neoplastic infiltration 6 years after surgery.

Results: After decongestive physical therapy, upper limb volume decreased and oedema was reduced from stage III and severe grade to stage II and minimal grade, as classified by the International Society of Lymphology. Currently, the patient is receiving physical therapy treatment (kinesitherapy and proprioceptive neuromuscular facilitation) for her brachial plexopathy, what is leading to progressive improvement of motor activity.

Conclusions: Apart from lymphoedema, there are other complications associated with breast cancer, such as brachial plexus injury. This has an impact on the patient's quality of life and causes serious disability. Physiotherapy and rehabilitation treatment can help improve the patient's physical condition. Traditionally, decongestive physical therapy has been contraindicated in patients with chronic tumour disease. However, current studies suggest that this contraindication should be reconsidered and that we should assess the possible benefits to the patient.

P7 - LYMPHOEDEMA AND RECURRENT ERYSIPELAS IN A PATIENT WITH POLIOMIELITIS

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Key words: Erysipelas, lymphoedema, recurrence, physical therapy.

Introduction: Erysipelas (cellulitis) of the leg is a painful infection of the skin or subcutaneous tissue. Recurrent episodes of erysipelas cause significant morbidity and health costs. There is a relationship between recurrent erysipelas and lymphoedema. Lymphoedema predisposes to recurrent erysipelas, which worsens the former. In the same way, recurrent erysipelas may damage the lymphatics, which causes lymphoedema. The inefficient muscular contraction due to muscle paresis may predispose to the development of oedema.

Objectives: This study has two main aims: In the first place, to show the importance of correct treatment in order to prevent skin infections. To do so, we will present a case report. In the second place, to carry out a literature review in order to determine the relationship existing between decongestive physical therapy and the reduction of infection frequency in patients with erysipelas and lymphoedema.

Method/Design: We present the case of a 68-year-old woman with sequelae of paraparesis of lower limbs secondary to poliomyelitis during childhood. The patient suffers from severe equinovarus deformity of her left foot as well as from lymphoedema secondary to erysipelas/recurrent cellulitis over a 6-year period. The patient was referred to Lymphoedema Unit, where she was empowered with the necessary skills to undertake self-care and hygienic measures. She was treated with bilateral decongestive physical therapy and custom-made flat-knit stockings were prescribed.

Results: After treatment, limb volume of both lower extremities decreased and stabilized. No episodes of cellulitis/erysipelas have been experienced in the last year.

Conclusions: Decongestive physical therapy and suitable custom-made stockings have been shown to be effective to prevent complications of lymphoedema.

P8 - THE INCIDENCE OF THE DEFLATING TIME ON THE VENOUS FLOW DURING INTERMITTENT COMPRESSION THERAPY

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The aim of the study is to check the incidence of the deflating time on the venous flow in the low limb. Through echography we recorded the incidence of the inflating/deflating process on the venous flow. We observed that, at the end of the deflating process, the venous flow is significantly decreased in comparison to the flow during rest. More than 25 seconds deflating time is necessary to provide the possibility for the venous system to recover to a flow similar to the flow present during the rest period.

P9 - NORDIC WALKING FOR THE MANAGEMENT OF LYMPHOEDEMA

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Key words: *Nordic Walking, lymphoedema, physical activity.*

Introduction: Nordic Walking is a full body physical activity currently expanding in Europe and it is associated to important health benefits for healthy and vulnerable or diseased populations. It consists on adding specially designed poles to the natural way of walking, helping propel the body forward and integrating the work of the upper and lower body. Although most of the research on the effects of Nordic Walking has been done on lymphoedema secondary to breast cancer, this modality has been proposed as an appropriate intervention in the management of both primary and secondary lymphoedema.

Objectives: To determine the benefits of Nordic Walking as a physical exercise indicated for populations suffering from lymphoedema.

Methodology: Literature review.

Results: Nordic Walking presents several advantages over other types of aerobic exercise and is a viable intervention to implement from a social-healthcare setting. Nordic Walking has been successfully used as an intervention in populations with lymphoedema secondary to breast cancer.

Conclusions: Nordic Walking is presented as a viable intervention in the management of lymphoedema. It presents advantages both from the physiological and implementation points of view. There is a need for further research to determine general recommendations regarding frequency and intensity of the exercise programs depending on the severity of the lymphoedema.

P10 - PROPOSED COMBINED PHARMACOLOGICAL TREATMENT FOR LYMPHEDEMA AND LIPOEDEMA

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Key words: *Lymphedema - Lipoedema Combined pharmacological treatment.*

Introduction: 2000 patients of different sex and age, secondary lymphedema and lipoedema of various degrees, particularly following chronic venous insufficiency. Lymphovenous disorders generally lead to lipoedema.

- Lymphedema: lymph accumulation in the interstitial space of the subcutaneous fatty tissue caused by lymphatic system defects.
- Lipoedema: connective tissue disorder surrounding adipocytes in epidermis, dermis and hypodermis, predominantly observed in women as a lower limb and gluteal localized dermatosis. Other findings: genetic predisposition, endocrine, metabolic and immunological dysfunctions, venous stasis, nutritional disorders, stress and sedentarism.
- Mixed Lymphostatic Disease: last stage venous insufficiency or lipoedema develops lymphedema and results in phlebolymphostatic insufficiency or lipoedema.

Objective: Show successful outcomes with combined pharmacological treatment: 2H-1 Benzopyran-2one tablets, cream or powder together with phlebotonics (hydroxyethylrutinosides and Diosmin-Hesperidine). Orthomolecular medicine maintains the molecular balance and improves circulatory disorders and thus reestablishes homeostasis. Calcium and magnesium strengthen the lymphovenous wall and prevent cramps. Vitamin D3: recommended as immunomodulator, increases phagocytosis in macrophages. Vitamin C: improves the venocapillary fragility and prevents easy bruising. We prescribe: normoproteic hyposodic diet, orthopedic compression elastic bandages, lymphokinetic physical exercise, manual lymphatic drainage, weight control, monthly measurement of the affected extremities and skin care to prevent Erysipela, a frequent complication.

Material and Method: - 1996-2012 period, - Age: 29 - 63 years, Sex: predominantly female, - Topography: lower limbs, abdomen and gluteal region

Results: Lymphedema and lipoedema reduction, with decreased cm waist, hip and lower limb measurements that prevents functional, aesthetic, psychological, work and social disorders.

Conclusion: Combined pharmacological treatment reduces lymphedema and lipoedema up to 90%. This is important given their negative impact on the patient's quality of life and the lack of effective manners of treatment to date.

P11 - TONOMETRY OF LIMB LYMPHEDEMATOUS TISSUES PROVIDES DATA FOR APPLYING EFFECTIVE COMPRESSION FORCE

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Key words: *Tonometry, lymphedema, compression.*

Introduction: Manual and pneumatic compression as well as elastic garments exert force generating tissue fluid (TF) pressure gradients necessary for fluid flow. The level of applied force propelling fluid is never exactly known. The generated transmural fluid pressures should exceed 30 mmHg, what is known from our previous studies. Generated pressures depend on skin compliance (rigidity) and subcutis hydraulic conductance.

Objectives: To learn what external force should be applied to produce flow-effective TF pressure, we pressed skin with a tonometer with force gauge and recorded fluid pressure with a subcutaneously placed sensor.

Methods: A tonometer with a force gauge 0 to 2500g per sq.cm, 10mm deep and 11.8mm diameter plunger was constructed. It was pressed against soft tissues at 5 limb levels to a depth of 10mm and exerted force was read off on scale. Simultaneously, TF pressure was recorded. Studies were carried out on 50 pts lymphedema stage I to IV. A chart with TF pressures on y-axis and applied force on x-axis was created. Correlation curve was drawn.

Results: There was good correlation between applied force and fluid pressure in stage I and II with soft skin. Force of 1000g/sq.cm produced pressures 25-40 mmHg. In stages II and IV correlation curve was flattened and high force was needed to obtain >30mmHg. In some cases 2500g was needed for generation of TF of 50mmHg.

Conclusions: Tonometer data of a given patient allow to set pneumatic device at a pressure ensuring TF flow. They also serve selection of garments of proper elasticity degree. Therapists can apply their hand force depending on tonometry measurements.

P12 - LYMPHEDEMA AND SPINAL CORD INJURY

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Key words: *Lymphedema, complication, infection, spinal cord injury.*

Introduction: Cellulite is one of the complications of lymphedema occurring in 25.5% of the cases. Usually the infection's gateway is a microtrauma by a bite, needles, scratches ... The most common reported microorganism is group A streptococci hemophilic especially staphylococcus. The symptoms can be pain, swelling, redness, heat, lymphangitis, chills, fever, vomiting ... requiring outpatient or inpatient antibiotic treatment. The incidence of spondylodiscitis varies from 4 to 24 cases per million per year. Staphylococcus aureus is the predominant pathogen accounting for about half of non-tuberculous cases followed by gram negative bacillus and others. Pyogenic spondilodiscitis affects preferentially the lumbar spine, only 10% occurs in the cervical spinal. Diagnosis is difficult and often delayed or missed due to rarity of the disease and high frequency of low back pain in the general population.

Objectives: To report a case of bad evolution of side effects of a lymphedema.

Case report: We report a case of 78 years old woman, independent in daily living activities, with medical record of chronic lymphedema due to lymphadenectomy for melanoma 20 years ago. As a consequence of multiple syncopal episodes, she was admitted to Department of Cardiology.

Cellulite was observed in the lymphedema and she related chronic neck pain. There were significant changes in the cervical region, as revealed by MRI, leading to the diagnosis of C5-C6 spondylodiscitis and C3-C4 prevertebral fluid collection.

Surgery treatment was ruled out and therefore she completed antibiotic therapy. The infection eased off but led to an incomplete tetraplegia ASIA D.

Conclusions: Lymphedema can be prevented or controlled with some measures including skin care, daily inspection and reporting to the health provider any signs of an infection. We would like to pinpoint the importance of good hygiene habits and preventive measures to avoid complications of lymphedema, such as local and systemic infections.

P13 - SCHOOL OF LYMPHEDEMA PREVENTION: YOUR CARE, OUR GOAL

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Key words: *Lymphedema, prevention, rehabilitation, education, school.*

Introduction: Patients who undergo lymphadenectomy need advice on preventive care to avoid the development of lymphedema.

Objective: To present the School of Lymphedema Prevention after Breast cancer Surgery.

Material and Methods: Prospective observational study of the rehabilitation outpatient medical consultation assessed woman. Patients were referred from Department of Gynecologic Oncology, Oncology, Radiotherapy? Preventive measures were explained individually in the first appointment, prevention standards and home exercises were delivered.

If they required lymphatic drainage therapy, they were recruited for the School of Lymphedema Prevention. A monthly meeting is organized up to 14 people. It is opened to patients and one family member is allowed. We inform about what the lymphedema is, how to prevent and treat it. Then, we establish a roundtable where patients can express their worries and concerns. At the end of each session, they are given a satisfaction survey.

Material resources: meeting room, computer, projector and roundtable. Human resources: rehabilitation physician and skilled physiotherapist.

Results: 27 meetings were conducted from 17 March 2010 until 20 March 2013. 184 people attended to School of Lymphedema Prevention. The survey showed high degree of satisfaction.

Conclusions: School of Lymphedema Prevention focuses on training and educating patients at risk of developing lymphedema or suffering from lymphedema and its families. Emphasis is on prevention, promotion of autonomy and activities of daily living, psychological and emotional support and reducing waiting list.

P14 - LYMPHEDEMA REHABILITATION UNIT. A DESCRIPTIVE STUDY OF THE CURRENT SITUATION IN ANDALUCÍA

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Key words: *Lymphedema, lymphedema unit, Andalucía.*

Introduction: Lymphedema is an unusual form of edema due to an abnormality of the lymphatic system. Because of its high prevalence and impact on quality of life, to establish a specific rehabilitation unit can be recommended.

Objecives: Description of lymphedema management in the current Lymphedema Rehabilitation Units in Andalucía.

Method and Design: Descriptive study. Data obtained, June 2012-February 2013, through a free and multiple choice combining survey, self-administered or by phone. Statistical Analysis: SPSS v.20.

Results: 46 centers were surveyed. We obtained responses from 43 of them, and only 11 centers have Lymphedema Rehabilitation Unit. All units are formed by a rehabilitation team, without involvement of other specialties. 45.5% composed of a rehabilitation physician and a physiotherapist.

Coordination is carried out by the rehabilitation physician in all units with part-time work. The physiotherapist, in 54.5% of the units is working full-time. 63.6% of the units cover all types of lymphedema.

The medical consultation takes place an average of 4 days a month, and the follow-up of the patients is every six months in 82.8% of the units. An average of 15 patients for the first time and 32 for review are seen per month. An average of 20 sessions are applied within a specific room (90.9%) and the treatment is repeated annually in 72.7% of the units. 100% of unit's treatment is based on complex physical therapy.

Conclusion: The existence of Lymphedema Rehabilitation Units enables prevention and early, effective and efficient treatment, for this chronic disease that requires high technical specialisation of all professionals involved.

P15 - ASSESSMENT OF DISABILITY IN PATIENTS WITH LYMPHEDEMA OF THE UPPER LIMB AFTER BREAST CANCER TREATMENT IN LUGO CENTER SANITARY AREA IN 2011

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Key words: *Lymphedema, breast cancer, complications, disability.*

Introduction: Lymphedema is described as an abnormal increase of protein-rich liquid in the interstitial space, due to an alteration of the lymphatic system's transport capacity. It is considered as the second cause of disability in the world.

Objectives: To analyze the epidemiology and the clinical features of breast cancer treatment-related lymphedema in our sanitary area, to determine the frequency of complications and to assess the disability level in these patients.

Method: This is a descriptive, retrospective epidemiological study including patients consulted in the Rehabilitation Service of Lucus Augusti University Hospital (Lugo) in 2011 with lymphedema of the upper limb after tumorectomy or mastectomy and axillary dissection. Patients with lymphedema in other localisations and with a different etiology were excluded, resulting in 34 patients.

Results: Pain was one of the most usual complications. Almost half of the patients showed shoulder pathology. Over 80% of the patients were independent in daily life activities. According to the classification of lymphedema severity, regarding the upper limb perimeter, the most frequently found stage was the moderate one, and according to the International Society of Lymphology staging, it was the ISL stage II. 44,1% of the patients had no disability, 50% had a mild level of disability and only in two patients it was moderate.

Conclusions: 7,05% of the patients operated for breast cancer in 2011 were seen in our Rehabilitation Service. The most frequent complications are pain, dermatological pathology and shoulder functional limitation. Almost all the sample showed a disability stage between non-existent and mild. Disability level is significantly related to the severity and the ISL staging of the lymphedema, shoulder pathology and shoulder functional limitation, dermatological pathology and age.

P16 - EVALUATION OF THE UTILITY OF THE SCHOOL OF LYMPHOEDEMA

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Introduction: Breast cancer is the most prevalent tumor in women and thanks to new treatments their life expectancy has increased; however it has also increased the risk of suffer from lymphoedema, which is the main complication after surgery and the first cause of disability. Because of the disinformation about this pathology, we created a school of lymphoedema in our hospital in order to educate patients about their pathology, risk factors and prevention measures. It is organized in groups of 40 patients and imparted by rehabilitation physician and physiotherapists during one hour.

Objective: To assess comprehension and application of the guidelines explained in school of lymphoedema.

Method: We took a poll to 100 patients with lymphoedema or risk of developing it, who attended to school of lymphoedema in which were recorded: infections, application and frequency of the health and diet guidelines and exercises, information received and satisfaction.

Results: 60% suffered from lymphoedema; all of them applied the theory the first 4-6 months, 88% 6-12 months and 92% continued after 12 months. 98% performed the exercises during 4-6 months, 82% during 6-12 months and 78% more than one year. The health and diet guidelines were performed even one year after the school. 4% did not apply the theory and 50% of these suffered and infection of the affected arm. 18% did not perform the exercises and 33% of these developed lymphoedema. Global score of the school was 8'7/10.

Conclusions: Lymphoedema is not curable but it is tractable and patient's information with risk factors must be given as early as possible. Education can reduce the incidence of this complication. Most of the attendees to the school of lymphoedema put into practice the guidelines taught, so it is an useful tool to inform patients to improve their quality of life.

P17 - IS LYMPHATIC DRAINAGE HELPFUL IN MUSCULOSKELETAL GRAFTS?

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Introduction: Open fractures in lower extremities with an important loss of tissue are treated with musculoskeletal grafts, being latissimus dorsi a quite common choice. Rehabilitation procedures are considered as irreplaceable techniques to achieve the best functional results, but there are not enough studies about how to use them for the esthetical improvement.

Objectives: Our aim is to demonstrate how lymphatic drainage can be a good option for the treatment of patients with muscular grafts, when there are not contraindications for its prescription.

Method / Design: Clinical case: Male 41 years old without remarkable illnesses or surgeries. He had a motorbike accident in August 2012 suffering an open Lisfranc's fracture-dislocation in his left foot, what was classified as a Gustilo IIB, and a severe tissue loss. Orthopedic surgeons operate him to reduce the dislocation using 5 Kichner's needles. Plastic surgeons operated him in two times: cleaning and replacing the tissue loss with latissimus dorsi graft made by microsurgery techniques as first surgery act and covering with skin grafts as the second act. The patient was examined in our Rehabilitation Department in February 2013 with the following main findings: swelling, redness, high skin temperature, serous exudation from skin wrinkles and pachyderm skin. Range of articular motion: 20° of ankle extension / 10° ankle flexion. Perimeter measurement (cm): 31 foot, 38 ankle, 32 leg.

Results: After lymphatic drainage combined with pressure dressing, the perimeter was reduced up to 4 centimeters per measurement and the external aspect was improved.

Conclusions: The volume decreasing achievement should be one our main purposes when prescribing kinesiotherapy in this sort of patients. That will help us to get an early movement of the affected join and to avoid stiffness as well. Reducing the edema by the activation of the lymphatic system seems to be a good method to fulfill this goal.

P18 - COMPARISON OF QUALITY OF LIFE IN PATIENTS WITH LYMPHEDEMA AND CHRONIC VENOUS INSUFFICIENCY

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Key Words: *Quality of Life, Lymphedema, Chronic Venous Insufficiency*

Introduction: Lymphedema and Chronic Venous Insufficiency are chronic, incurable, debilitating condition, usually affecting a limb and causes discomfort, pain, heaviness, limited motion, unsatisfactory appearance and impacts on quality of life.

Objectives: The aim of this study was to compare quality of life in people with lymphedema and chronic venous insufficiency.

Method/Design: This study was conducted on 18 people with lower extremity lymphedema and 14 people with Chronic Venous Insufficiency. Lymphedema group's participants mean age was 46.65±15.00 years and chronic venous insufficiency group was 51.86±9.83 years. The Nottingham Health Profile (NHP) was used to measure the quality of life.

Results: Lymphedema group participants NHP total scores found as 120,31±121,32 and Chronic Venous Insufficiency group's total scores found as 97,39±60,36. Subsections of NHP's like pain, physical activity, energy levels, sleeping, social isolation and emotional reactions mean values of the Lymphedema group as order 19,10,63±26,91, 25,10±27,61, 36,80±42,86, 26,22±30, 30±2,37±6,90, 10, 70±16,65 and values of the Chronic Venous Insufficiency group found as 27,58±22,30, 22,94±15,58, 21,37±24,32, 18,42±26,29, 3,01±11,26, 4,10±8,81. There wasn't any significant difference found between two groups quality of life scores (p>0.05).

Conclusion: Chronic diseases like Lymphedema and Chronic Venous Insufficiency reduces individuals quality of life. Symptoms like edema, pain, limitations and discomfort which we encounter both diseases. We believe that reduction of these symptoms will positively effect quality of life the participants.

P19 - DOES COMPLEX DECONGESTIVE PHYSIOTHERAPY DECREASE FALL RISK IN PEOPLE WITH UNILATERAL LOWER LIMB LYMPHEDEMA?

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Key Words: Balance, Lymphedema, Fall Risk, Complex Decongestive Physiotherapy.

Introduction: Balance can be defined as the ability to return the center of mass within the base of support to maintain body stability against perturbation. It is known that postural asymmetry can be affected first in measures of the body weight applied to both feet among specific patients as a result of some diseases like lymphedema.

Objectives: The aim of this study was to evaluate the static postural stability and fall risk people with unilateral lower limb lymphedema after complex decongestive physiotherapy.

Method/Design: This study was conducted on 8 people who had lower limb lymphedema. Mean age of participants was 39,25±18,43 years. Complex decongestive physiotherapy was applied for 4 weeks. Participants balance evaluated before and after treatment. The Biodex Balance System was used to measure the parameters of postural stability and fall risk. The data acquisition involved 3 trials of 20 seconds to test the postural stability test. It was made in 3 directions (overall, anterior-posterior [AP], and mediolateral [ML]). The fall-risk test was performed under the following conditions: (1) eyes open, firm surface; (2) eyes closed, firm surface; (3) eyes open, foam surface; and (4) eyes closed, foam surface.

Results: For the fall risk, significant difference ($p > 0.05$) was observed in actual score after the treatment. There were no statistically significant differences in the eyes open, firm and foam surface; eyes closed, firm and foam surface; and overall, AP, and ML displacement parameters results the lower limb lymphedema ($p > 0.05$).

Conclusion: Reduction of lymphedema could be effective in decrease postural sway. Complex decongestive physiotherapy reduces the risk of falling caused by lymphedema.

P20 - LYMPHEDEMA SURGICAL APPROACH

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Key Words: Surgical, lymphedema, conservative, evidence, long-term.

Introduction: Lymphedema surgery has opened a pathway to a chronic and disabling pathology. Although we have no long-term follow-up studies, expectations seem good. There are two types of surgery: lymphatic-venous anastomoses (LVA) and nodal transpositions. The LVA is the most used technique. The main difficulty lies in the selection of patients who will benefit from the surgery.

Objectives: The goal is to reduce limb volume, reduce episodes of infection, decrease associated treatments drainage and containment and improve quality of life. We report surgical lymphedema cases in our hospital and a literature review with the aim of picking up its indications and evaluate results.

Methods: We report four cases: two upper limbs by ganglion transposition (secondary to breast cancer) and two lower limbs by lymphatic-venous anastomosis (one primary and one secondary) and a literature review using PubMed, Cochrane Library and Tripdatabase. We analyze the few existing treatment protocols pre/postoperative.

Results: We evidenced a volume decrease, lymphangitis and patient satisfaction, but not in postoperative containment. In the literature we found: The volume reduction varies between 118-13%. The earliest secondary lymphedema represent the best indication for surgery. The greatest reductions were found after LVA (54.9%), followed by ganglionar transfer (47.6%). Most series are small, measuring techniques used are nonstandard or inconsistent, with a short tracing. Subjective improvements have been obtained between 40-87% of the surgical patients. There are no prospective clinical studies comparing long-term outcomes among patients with lymphedema operated and nonoperated. Complications are not usually published.

Conclusions: These surgical techniques do not obviate the need to continue the conservative lymphedema treatment, including long-term compression, with evidence of long-term good results and good patient adherence. The success of the surgery should be measured not only by the volume reduction, but also by decreasing the consistency edema, patient satisfaction, improved quality of life.

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P21 - LYMPHEDEMA REHABILITATION TREATMENT IN HOSPITAL JARRIO, ASTURIAS: A CASE REPORT

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Key Words: *Rehabilitation, lymphedema, lymphatic drainage, acupressure.*

Introduction: Lymphedema is an abnormal increase of protein-rich fluid in the interstitial space due to an impaired ability to transport the lymphatic system, which is manifested by an increase in size or swelling of a limb or body region.

Objectives: To assess the effectiveness of the rehabilitation treatment of lymphedema in a Hospital 2nd level.

Method: In the first query history, explores and takes measures to patients, they explained their pathology, postural measures and skin care. After Rehabilitation treatment performed 2 or 3 times a week with a specialized physiotherapist based on:

1. Manual Lymph Drainage: Vodder technique that stimulates the lymph nodes draining collectors and compresses edema proximal to distal.
2. Air Pressotherapy with multicompartiment sequential compression pumps with linear pressure (less than 40-50 mmHg) from distal to proximal.
3. Following the same should carry out a bandage until the next day with Low Elasticity Bandages to improve the efficiency of the muscle pump.
4. Explain Exercises to do at home: Breathing exercises, neck, upper limb.
5. Once stabilized reduced lymphedema used as maintenance therapy Garments Compression Sleeves Pressotherapy or flat knit, made to measure, of 30-50 mm Hg and replace every 3 or 6 months. Put 24 hours or only for daytime use.

Results: Patients have improved the discomfort and heaviness of the affected limb, has also decreased limb volume.

Conclusions: Rehabilitation treatment is an effective method for lymphedema acute, subacute and chronic.

P22 - THROMBOPHILIA, PHLEBO-LYMPHEDEMA AND LEG ULCERS

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Key Words: *Thrombophilia, phlebo-lymphedema.*

Introduction: Activated protein C (APC) resistance is the most frequent cause of venous thrombosis. The risk of thrombosis is increased 5-10 fold for heterozygous persons and 50-100 fold in homozygous persons. Phlebo-lymphedema associated with activated protein C resistance is a not frequent pathology. In the literature we only found one similar case in where the treatment was intermittent pressotherapy.

Case report: A 75-year-old with a history of deep vein thrombosis and pulmonary embolism secondary to APC resistance, presents phlebo-lymphedema of the lower limbs and leg ulcers. In the past the patient had frequent infections of the ulcers. The patient was not diabetic. Examination revealed severe phlebo-lymphedema, positive Stemmer, extensive ulcers over the medial and lateral malleoli and the arterial pulses were present. Phlebography revealed a severely impaired superficial and deep venous system in both legs caused by nonfunctional venous valves compatible with venous thrombosis. Lymphatic drainage and pressotherapy were contraindicated so we decided the treatment with Class I compression stockings (18mmHg) and kinesitherapy with marked improvement of the ulcers and the phlebo-lymphedema decrease in a 45%.

Conclusion: Treatment with Class I compression stockings and a specific exercises program designed to assist venous-lymph drainage have show excellent results in volume reduction and improvement of leg ulcers.

P23 - LYMPHEDEMA IN GENERALIZED LYMPHANGIOMATOSIS: A CASE REPORT

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Introduction: Generalized lymphangiomas is a rare entity that is due to a flaw in the development of the lymphatic system. Cancer risk is increased and as many as 65% present during childhood. The rate of progression of the disease is unpredictable and the prognosis depends on the involved organs and the extent of the disease.

Objectives: We report the case of generalized cystic lymphangiomas associated with venous malformation in left hand and lymphedema.

Method/Case report: A 6-year-old boy was referred from vascular surgery for congenital vascular malformation assessment in the left upper limb (UL). Personal medical history: Excision of deep cervical cavernous lymphangioma in 2006, left chest axillary lipoma excision in 2007, resection of arteriovenous hemangioma and lipoma with lymphangioma in 2008. Physical examination: lymphangiomas affecting cervical spine, both arms and left UL. Erythematous skin lesions and significant edema in left hand soft consistency without pitting sign. Hypertrophy of the left hand and forearm. The mobility was preserved, with weakness (3/5) and global hypoesthesia. Facial symmetry was preserved with lesions outside of the right eye.

Results: MR showed a lipomatosis lymphangiomas with severe involvement of the left UL with left medial infraclavicular arteriovenous malformation. Lymphoscintigraphy showed lymphatic involvement in all four limbs.

The patient was sent to Lymphedema Unit to try to reduce the edema compound of the hand. He was treated with decongestive lymphatic therapy. A compression garment was prescribed to maintain the volume reduction.

We proposed to use the 432 OK but the patient is not symptomatic stability of small cystic lesions and the treatment is not without significant side effects. A year later, lymphedema remains stable.

Conclusions: Generalized lymphangiomas is little reported in the literature. The report of our experience contributes to the knowledge of this disease in its presentation, treatment and prognosis.

P24 - MAINTENANCE TREATMENT IN LYMPHEDEMA: REVIEW

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Key Words: *Lymphedema, maintenance.*

Introduction: Chronic lymphedema is swelling caused by failure of the lymphatic system. Treatment can be subdivided into two phases: an intensive phase that aims to reduce the volume of the affected limb, and a maintenance phase to maintain the results of the decongestive treatment. Long-term therapies include MLD, self-lymphdrainage, low-stretch bandaging or compression garments, and sometimes when indicated intermittent pneumatic compression, exercises, and skin care.

Objectives: To review the scientific evidence concerning the lymphedema management in the maintenance phase.

Method/Design: A systematic review of English-language papers published from 2003 to 2013 using MEDLINE, CINAHL, clinical key, ovid, EMBASE, and the Cochrane Library (clinical trials registry and the Database of Systematic Reviews).

Results: Forty-six studies were included. Most of them refer to lymphedema secondary to cancer disease; there are only two about primary lymphedema. The 59.4% of cases is on upper limb, 25% on lower and the 15.6% do not specify or refer to both. Most agree that compression therapy is the most effective treatment in the maintenance phase, as bandages or low-stretch compression garments. Thirteen of the papers mention the pneumatic compression for maintenance therapy at home, four of them with flexitouch device, finding no differences with the other methods. One of them refers to the system Juxta-fit. Three articles discussed in the possibility of surgery for treating chronic lymphedema. Only one of the studies referred to multilayer bandage.

Conclusions: The cornerstone of maintenance treatment is compression, but at present, no method has been proved to be more effective than others. Most of the literature refers to the first intensive phase, but very few papers focus on maintenance phase. Further research and interdisciplinary collaboration of all the professionals is needed to improve the knowledge in this field.

P25 - LIPEDEMA: TRYING TO SET DIAGNOSTIC CRITERIA

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Introduction: Lipedema is misdiagnosed and poorly investigated disorder with only few publications in this field.

Objectives: To describe signs and symptoms of patients with lipedema to set diagnostic criteria.

Design: Prospective cohort study of patients with lipedema.

Female patients were included if they present with bilateral lower limb (LL) enlargement and at least 3 symptoms of lipedema: spontaneous or provoked pain/tenderness, easy bruising, family history of lipedema, absence of LL injuries, absence of Stemmer sign, symmetrical LL involvement, no swollen feet; and consent to participate.

Endpoint was the prevalence of symptoms and signs present in lipedema: bilateral and symmetrical involvement; disproportion with upper part of body; spare feet; pain, bruising; absence of Stemmer sign; family history, upper limb involvement; pitting test; fibrosis; venous insufficiency; vascular spiders; skin coldness; worsening at night.

Type, stage of lipedema, and type and intensity of pain were also assessed.

Results: From September 2012 to April 2013, 53 patients were included in the study. Median of age was 56.1 years (range:20.7-72.5), the mean age at the onset was 25.9 years (+14.4), related more frequently to puberty in 32.1%.

The time elapsed until diagnosis was 23.4 years (+14.8).

All patients had bilateral and symmetrical involvement; 76.5% disproportion with upper part of the body; 86.8% spare feet; 92.5% pain, 85% bruising; 83% absence of Stemmer sign; upper limb involvement in 15.1%; pitting in 15.4%; fibrosis in 9.6%; venous insufficiency was present in 29.4%; 78.4% had vascular spiders; 23.4% complained about skin coldness; 94.2% were worse at night. A 71.7% of the patients reported positive family history of lipedema.

Most frequent type of lipedema was Type 3, from hip-to-ankles (60.4%). 42.3% presented a Stage II lipedema.

Concerning pain, 46.7% was neuropathic and 53.3% nociceptive somatic, in 97.7% was mild-moderate.

Conclusion: These features should be considered in the diagnosis of lipedema. Further research is ongoing.

P26 - EFFECTIVENESS OF TOPIC LIDOCAINE PATCH IN POSTMASTECTOMY PAIN SYNDROME

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Key Words: *Postmastectomy pain syndrome, neuropathic pain, lidocaine patch.*

Introduction: Postmastectomy pain syndrome (PMPS) has been defined by International Association for Study of Pain (IASP) as a chronic pain after mastectomy or lumpectomy affecting the anterior thorax, axilla, and/or medial upper arm. Although several factors could be involved in its pathogenesis, a major role of the injury in the second intercostobrachial nerve has been postulated. Systemic drugs are effective but the appearance of adverse effects precludes an adequate adherence to treatment. In this sense, lidocaine topic patches, could be useful, although no studies have specifically addressed their potential efficacy in PMPS.

Aim of the study/Design: We prospectively analyzed the effectiveness of lidocaine patches (Versatis®) on the short-term management of PMPS in a single institution.

Patients and Methods: Fifteen consecutive breast-cancer patients were treated with lidocaine patches at 5%, 12 hours a day over the painful area, for a total treatment period of 3 weeks. Pain characteristics were assessed at baseline by the DN4 scale. Pain intensity was graded by a Visual Analogic Scale (0-10) both at baseline and after 3 weeks of treatment.

Results: The mean DN4 score at baseline was 6.9 (95%CI: 6.2-7.5), suggesting the neuropathic origin of PMPS. A total of 12 patients reported pain improvement, whereas 3 did not. The mean pain score measured by the VAS was 7.0 (95%CI:6.3-7.6) at baseline, and 3.7 (95%CI:2.2-5.2) at the 3 weeks follow-up. Thus, the mean improvement in VAS after treatment with lidocaine patches was 3.2 (95%CI:1.9-4.5). No side effects were reported.

Conclusions: The current study suggests that the treatment with lidocaine patches could be an effective and well-tolerated strategy for reducing PMPS. However, randomized studies are needed to compare the different therapeutic options for this entity.

P27 - CASE REPORT OF ASSOCIATED CHYLOUS ASCITES, GENITAL AND LOWER LIMB LYMPHEDEMA

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Introduction: Chylous ascites (CA) is an uncommon finding with a reported incidence of 1/20.000 to 1/187.000 admissions. Pathophysiology is related to disruption of the lymphatic system because of traumatic injury or obstruction. The cause can be benign or malignant. This entity can be equaled to abdominal lymphedema, and it is important to consider it when treating obese patients with genital and lower limb lymphedema (LLL). The management of CA and LLL must have a multidisciplinary approach, involving nutritional and rehabilitation therapies.

Objective: To report a clinical case of a patient with concomitant CA and chronic LLL worsened after rectal cancer radiotherapy and to highlight the combined nutritional and decongestive management.

Clinical description: 74 years old female with previous rectal adenocarcinoma, T3N0M0, treated with surgery, chemo and radiotherapy. CA was found in the surgical act and remained non-treated until two years later when therapeutic paracentesis was performed for tension ascites. She was referred for evaluation for stage III chronic genital and LLL. Lymphoscintigraphy was reported as probable primary lymphedema due to an idiopathic thoracic duct stenosis worsened after radiotherapy. As a result of CA she suffered severe protein-calorie malnutrition. The patient was evaluated by a Nutrition and Rehabilitation team and admitted for total parenteral nutrition (TPN) and complex decongestive therapy of LLL. At discharge (12 days TPN) she had lost 9 kilograms and was prescribed a maintenance non-fat diet, middle-chain triglyceride oil, protein, potassium, calcium and vitamin D supplements. The evolution was satisfactory, resulting in resolution of CA and improvement of LLL.

Discussion: CA has a mortality rate up to 20% as a result of sepsis and malnutrition. Diagnosis is confirmed with triglyceride levels >200 mg/dL in the ascites fluid. To localize the site of lymphatic leakage lymphangiography or lymphangioscintigraphy can be useful. Treatment attempts to diminish lymphatic flow and its peritoneal leakage. Conservative management includes a period of oral intake restriction with total parenteral nutrition to avoid intestinal fat absorption. Palliative paracentesis should be performed if important dyspnea is present, alone or with diuretics. Cases of postoperative lymphatic fistula can be treated with continuous intravenous high-dose somatostatin or surgical repair, facilitated by a heavy fatty meal preoperatively to help visualize the fistula. In severe refractory CA a peritoneovenous shunting can be performed at risk of severe infection, fat emboli or intravascular disseminated coagulation.

CONCLUSION: The association of CA and lymphedema constitutes a complex clinical problem that requires a multidisciplinary treatment. This case report represents an example of successful team work with a comprehensive approach to this unique pathology.

P28 - SURGICAL MANAGEMENT OF PENILE LIMPHOEDEMA SECONDARY TO ERISIPELA BY CUTANEUS FLAP

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Key Words: Penile lymphedema, cutaneous flap.

Introduction: The aim of this study is to explain a kind of surgical treatment to secondary penile lymphedema in a young man.

Material and Methods: Clinical review of a 38 years old patient referred to our hospital because of penile lymphedema. We review the different diagnostic methods used (laboratory, imaging and pathological results) and the final treatment performed. Surgical results, sexual function, complications and patient satisfaction are discussed.

Results: Patient with medical history of penile cellulitis secondary to *Streptococcus pyogenes* (Erysipela) infection six months ago. As a consequence shows gummy consistency edema without associated dermal damage limited to the penis that disables sexual activity and makes difficult bladder empty (dripping). There was no evidence of drug accumulation at genital area during lymphoscintigraphy. The MR showed large skin strengthening around the cavernous corpora and glans with fibrous tissue predominance. With the cosmetic surgery and urology department collaboration we performed a surgical resection of the fibrous tissue with lateral penile cutaneous flaps. There were no complications during the intervention and in the post-operative. The pathology report showed non-specific inflammatory chronic points focused at dermis and hypodermis with important interstitial fibrosis. With specific coloring DC-31 and D2-40 the presence of lymphatic vessels was confirmed. Six months after the intervention the penis showed a satisfactory cosmetic appearance without edema recurrence, no urinary symptoms and the patient has gotten over the sexual activity.

Conclusions: When surgery is needed for penile lymphedema treatment the cutaneous flap technique provides excellent esthetic and functional results.

P29 - INCIDENCE AND REHABILITATION OF CANCER RELATED LYMPHEDEMA IN A TERTIARY HOSPITAL

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Key Words: *Cancer, lymphedema, surgery, rehabilitation.*

Introduction and objectives: To present the characteristics of patients who were admitted to the Lymphatic Drainage Unit from January to December 2011.

Material and Methods: It is an observational retrospective study of patients who were admitted and attended to the Lymphatic Drainage Unit of our University Hospital throughout 2011. Data were collected from the medical records of patients. We recorded age, gender, type of cancer, surgery and adjuvant treatment, development of lymphedema. Preventive measures were explained individually in the first appointment. Furthermore, treatment for seroma, scars and shoulder movement therapy was applied to all the patients. If lymphedema occurred, the training was supplemented by Decongestive Physical Therapy sessions. Group therapy was conducted in the School of Lymphedema Prevention. Emotional support was provided during the whole process.

Results: A total of 147 patients were assessed in the rehabilitation outpatient medical consultation, 118 of them were referred to Lymphatic Drainage Unit. Male/female ratio was 21:97. Mean age was 55.77 years (Range 13-85). Concerning the underlying disease, 72.88% underwent breast cancer surgery, 81.4% of them were given adjuvant (radio / chemotherapy) treatment and 16,1% suffered from lymphedema. 12.71% of the sample underwent surgery for cancer of the larynx, 85% of them were given adjuvant treatment and all suffered from submental lymphedema. Other surgery cancer processes (14.41% of the sample) developed lymphedema in 7.6% of the cases. All of them (93%) underwent lymphadenectomy.

Conclusions: According to the reviewed literature from lymphedema,, the risk of developing lymphedema is directly related to the type of surgery, lymphadenectomy, and increases in association with adjuvant treatment. In our experience, 93% of the patients attended in Lymphatic Drainage Unit underwent lymphadenectomy, 81% of them received adjuvant treatment and 36% of them suffered from lymphedema.

P30 - UPPER LIMB ELEPHANTIASIS TREATED ONLY WITH SELF-BANDAGES AND COMPRESSION GARMENT

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Introduction: The management of severe lymphedema includes decongestive lymphatic therapy to reduce limb volume, skin care and preventive strategies to avoid complications. But, patient's preferences must be respected and treatment options adapted when needed.

Objective: To report a clinical case of a patient with stage IV upper limb (UL) lymphedema successfully managed with daily self-bandages at home.

Case description: A 90-years-old woman presented at the clinic with breast-cancer-related-lymphedema in her left UL for 25-year. The cancer had been treated with modified radical mastectomy, lymphadenectomy, chemo, radio and hormonal therapy. Later she developed an epidermal cancer in the left UL that was treated successfully with surgery. She was partially dependent for activities of daily living and lived with her son or daughter 40 km away from hospital. She had developed stage IV elephantiasis lymphedema with important volume, chronic skin complications and severe disability. The examination showed joint limitations at the shoulder, elbow and hand. Left UL volume was 4831 ml and the Excess Volume was 3147 ml. Perimeter differences with contralateral limb were 8.4 cm at hand, 18.2 cm at forearm, 20.3 cm at arm. The Medical prescription was decongestive lymphatic therapy on an out-patient daily basis but she refused any treatment. Self-bandages were then taught to the patient and her family to apply them daily, at home. The materials for bandages were provided to them and the training was supervised. Two months later, the volume was reduced; the perimeter differences were: 2.5 cm at hand, 4 cm at forearm and 4 cm at arm. A flat-knitted compression garment was prescribed for the maintenance phase.

Conclusion: Despite the need of Decongestive Lymphatic Therapy, compression is the cornerstone of the lymphedema management. Self-bandages can be a suitable option for patients unable to undergo Decongestive lymphatic therapy.

P31 - LYMPHEDEMA IN EPIDERMODYSPLASIA VERRUCIFORMIS: AN UNCOMMON COMPLICATION

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Introduction: Epidermodysplasia verruciformis is a rare hereditary disease, first described by Lewandowski and Lutz in 1922 characterized by a susceptibility to skin infections papillomavirus.

Material and Methods: A 43 year old patient assessed for testicular and left leg lymphedema. As background, the patient was diagnosed at 15 years of epidermodysplasia verruciformis and congenital immunodeficiency CD4/CD8.

The examination revealed multiple erythematous flat warts on trunk, hands, upper and lower extremities and face. He presented a grade IV lymphoedema from foot to groin. Stemmer⁺⁺⁺. Grade III genital lymphoedema (previously diagnosed as testicular hydrocele). Isotopic lymphoscintigraphy was requested: "lymphodysplasia in left lower extremity" MR of thigh and pelvis ruled out compression by lymphatic masses.

Treatment is performed with decongestive therapy for lymphedema: lymphatic drainage massage, compression bandages and compression garment is applied with genital reinforcement for lower limbs.

Results and Discussion: The association of lymphedema and epidermodysplasia verruciformis has not been described in the literature. The reported case raises a possible relationship between the lymphatic and immune lymphodysplasia CD4/CD8 that conditions papillomavirus superinfection.

Therefore, given a patient with immunodeficiency CD4/CD8, it should be considered the possible involvement of the lymphatic channels.

P32 - LYMPH TAPING, COMPLEMENTARY LYMPHOEDEMA TREATMENT?

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Key Words: *Lymph Taping, Kinesiotape, Lymphoedema, Kinesiotaping application technique.*

Background: Lymphoedema is a progressive chronic condition resulting from the accumulation of fluid and other elements in the tissue spaces due to an imbalance between interstitial fluid production and transport. Lymph taping is a method of Kinesiotaping that would have physiological effects including decreasing pain or abnormal sensation, removing congestion of lymphatic fluid or hemorrhages under the skin. After applying Kinesiotaping, the taped area will form convolutions to increase the space between the skin and muscles. Once the skin is lifted, the flow of blood and lymphatic fluid is promoted. AIMS: To explain the application technique and to analyze the effectiveness of lymph taping using the bibliography published of this area.

Methods: We have made a review of different studies, considering lymph taping and its application technique, and comparing it with exercise therapy, manual lymph drainage and compression therapy (bandages, pneumatic compression). The searches were realized in the databases MedLine, Cochrane, PubMed, ClinicalKey, Dynamed, TripDatabase and Science Direct using keywords such as Lymph Taping, Kinesiotape, Lymphoedema, Kinesiotaping application technique. Limits were not established for the date of publication of the articles, and we included clinical trials and clinical reviews.

Results: According to studies, this technique is successful in aspects such as oedema, pain, proprioception, blood and lymph circulation. The application technique consists of cutting the tape in a fan-shaped fashion and applying it with little to no tension within the stretched area of oedema. The tape, usually funnel-shaped, should be pointing toward the closest lymphatic drainage channel. Next application is placed from a different angle and direction drawing the lymph towards the secondary lymph nodes.

Conclusions: Lymph taping can be used like a complementary treatment in lymphoedema. Even though this technique is obtaining positive results, scientific validity must be provided through studies to demonstrate it and make its application less empirical.

P33 - COMPLEX REGIONAL PAIN SYNDROME: A CASE REPORT

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Introduction: The complex regional pain syndrome (CRPS) is a neuropathic pain condition accompanied by vascular changes, that most often affects the upper limb. Type 1 occurs after an illness or injury that did not directly damage a nerve in the affected area. The type 2 follows a defined nerve injury.

Objectives: The aim of this paper is to describe a case of chronic algodystrophy which has evolved to edema with lymphatic characteristics, and the treatment used in our unit.

Materials and Methods: Description of a clinical case.

Results: We describe a 44 year old woman affected of grade IV right superior limb lymphedema associated with Sudeck's syndrome, secondary to right carpal tunnel intervention in 2008. After failure of treatment with physiotherapy, pharmacotherapy and psychotherapy, in addition to several treatments in the Pain Unit (catheter implantation in brachial plexus, sympathetic blocks, etc.), the patient has chronic pain in right arm and hand with an EVA 5/10 with episodes of exacerbation 8/10, dysthermic sensation in hand and arm, complete functional impotence of right upper limb, and severe edema. Edema treatment was established with decongestive therapy consisting in manual lymph drainage and multilayer bandages and analgesic pharmacotherapy. Once edema was reduced, the treatment implied occupational therapy and adaptation of postural splints with reeducation of activities of daily living. Maintenance treatment is performed with compression garment adapted to the situation of the patient.

Conclusion: In conclusion, Sudeck's syndrome is associated with edema in its acute phase, but edema can be also found in the chronic period. Edema control is essential to improve upper limb joint mobility and function. This can help improve the quality of life and pain control in these patients.

P34 - HUMAN AND MATERIAL RESOURCES FOR THE REHABILITATION OF LYMPHEDEMA IN THE PUBLIC HEALTH SYSTEM OF VALENCIAN COMMUNITY

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Key Words: *Material resources, Human resources, Valencian Community, Lymphedema.*

Background: As lymphedema Reference Unit of Valencia, we have been prompted to make a study of material and human resources dedicated to the prevention, diagnosis and treatment services available to RHB Public Health System Health in our Community.

Aims: To develop a document that can serve our SVMEFR Scientific Society as a reference for future actions in the field of clinical care and research on lymphedema in our Community.

Methods: Survey sent by email to the various department heads rehabilitation of 21 health departments Valencian Community, through the President of the Valencian Society of RHB. Once answered by the service chiefs, was forwarded to the author of the study.

Results: Describe human and material resources available to different rehabilitation services public health departments of Valencian Community of lymphedema. 100% services attempt Lymphedema. 33.3% have specific consultant attempting lymphedema. 38.8% dispose of specific consultation. The average of to attend lymphedemas is 6.7 h/week. 83.3% have physiotherapists with specific training in lymphedema treatment from them. 44.4% have specific dedication to treat lymphedema Average time for lymphoedema physiotherapy 21.1 hours/week. One service has inpatients. 72.2% have specific space within the area of physical therapy to treat lymphedema. 33.3% have a toilet in it. All the services have multicompartimental pressotherapy. 77.7% disposed of Low-stretch bandages. 66.7% have Lymphedema Prevention Program in cancer patients. 72.2% have school of lymphedema: kinesiotherapy education, prevention, self-care complications and lymphedema. All do manual lymphatic drainage. 100% have pneumatic multicompartimental pressotherapy. 77.7% use low-stretch multibandages. 66.7% have bandaging school. 27.7% treat ulcers.

Conclusions: All health departments have basic resources for the treatment of lymphedema, however there are disparities in the distribution. Only some departments dedicate specific staff to the diagnosis and treatment of this pathology and has ability to handle complex cases. The only department with inpatients is Hospital Universitario y Politecnico La Fe.

P35 - PUNCH TAPE, A NEW WAY TO TREAT LYMPHEDEMA

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Key Words: *Lymphedema, Punch-tape, physiotherapy.*

Introduction: Medical Taping Concept (MTC), originated in Japan, uses an elastic bandage to influence muscles, joints and nervous system and improve the lymphatic and blood circulation. This way it helps the body to recover its self-healing capacity. Punch-tape is a type of Tape riddled with holes in an asymmetric pattern that creates different tension lines within the same piece of tape. This makes a major effect on the superficial fascia, neuro-lymphatic system and analgesic response (endorphins), draining haematoma and edema. The hypothesis of this study is to verify the efficacy of the treatment with punch in lymphedema, both in development phase and maintenance phase of the pathology. The objective is to demonstrate that this new method can be very useful, because of its results, its high patient's acceptance and its easy application way; so it can complement traditional treatments.

Objectives: Check if the Punch-tape treatment can be an alternative way to the traditional treatments.

Method: The patient used for this study was a 54-year-old woman, who had modified radical mastectomy and removal of left underarm lymph nodes due to a breast cancer in stage T4b N2 M0. She was undergoing compression stocking.

Currently, the patient only the punch tape is used in her treatment, the treatment with punch was applied every 7 days.

Punch-tape application consisted of three strips placed along the length of the affected arm in spiral. The first one was applied from the subclavian triangle, the second one from the top of the shoulder and the last one from the posterior thoracic area, all of them ending around the wrist and the hand. As reinforcement two strips were added to the bandage, one from the front part of the thorax to the underarm area and the other from the posterior thoracic area to the posterior part of the axilla.

The volume changes were evaluated using the Markowski formula:

$$\left(\sum \text{pre-treatment circumference} - \sum \text{post-treatment circumference} \right) \times 100 / \sum \text{pre-treatment circumference}$$

And volume control of Kuhnke formula:

$$\text{Vol} = (C1^2 + C2^2 + \dots + Cn^2) / \pi$$

Also, control pictures were taken before, during and after of four week of the treatment with Punch-tape.

Results: In the beginning of the treatment with punch tape, the sum of the measures of the circumferences (finger, hand, wrist, forearm and arm) was 177.9, And volume control was 1407, after the four weeks of Punch-tape treatment, the results were: the sum of the measures of the circumferences was 175.5, the volume control 1370 and the Markowski rate was 1.35.

The patient did not completely tolerate the traditional treatment but she accepted pleasantly the new treatment, she declared that she feels better and safer with this treatment; besides, the effects after the Punch-tape application stay longer.

Conclusion: The Punch-tape in lymphedema is a completely new treatment, and despite the good results obtained in this case, more lines of investigation must be opened to improve and optimize the use of this method, not only in lymphedema but in other edema related pathology and return circulation problems.

P36 - QUALITY OF LIFE IN WOMEN AFTER BREAST CANCER SURGERY

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Key Words: *Mastectomy, lymphadenectomy, quality of life, lymphedema.*

Introduction: Breast cancer survivors face unique health challenges, such as lymphedema that could impact their health-related quality of life. The prevalence of lymphedema is reported up to 60% and many may feel overwhelmed or frustrated knowing that no cure exists for it.

Objectives: To quantify the quality of life (QL) in mastectomized women with lymphadenectomy.

Materials and Methods: Transversal study of mastectomized women assessed in our Department of Rehabilitation Medicine in July 2012. We assessed range of motion (ROM), functional impairment, sensitivity and limb circumference with physical examination; we also assessed pain level, sadness, State Trait Anxiety Inventory (STAI), SF-36 QL Instrument and EORTC QLQ BR23 QL Questionnaire.

Results: A total of 20 women were assessed. Mean age: 54.35 years. Mean time between diagnosis and study was 85.45 months. As for cancer treatment, 65% of them undergone radical surgery, 95% lymphadenectomy and all of them received adjuvant treatment. 95% had normal ROM and none had functional impairment. Limb circumference difference was from 0.5 to 10 cm. 60% developed lymphedema. Disesthesia sensation was reported in 80%. According to emotional disorders, STAI showed A-E 14; A-R 10.18 and depression was diagnosed in 5%. In relation to QL questionnaires, SF-36 data showed: physical functioning 66.59; role limitations due to physical health 38.63; role limitations due to emotional problems 56.06; energie 50, 06; emotional well being 58,41; social functioning 71.59; pain 56.59; general health 46.36. EORTC QLQ BR-23 showed: Function 75.69, symptoms 79.46. There were no dropouts.

Conclusions: Preventive therapies of lymphedema and kinesitherapy are effective for physical functioning. Nevertheless, lymphedema occurs at appreciable rates, QL is reduced and its impact should not be underestimated. It is necessary to perform more studies with reliable questionnaires to identify the items to work on improving health related QL.

P37 - VALIDITY AND RELIABILITY OF LYMPHEDEMA QUALITY OF LIFE INVENTORY (LYQLI)

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Key Words: *Quality of life, lymphedema, questionnaire.*

Introduction: Some quality of life questionnaires have been developed for patients with lymphedema in either upper or lower limbs. However, a questionnaire for all kinds of lymphedema patients has been developed in Australia and adapted to Swedish conditions and tested, showing good validity but moderate reliability (Klernäs & Johansson 2010).

Objectives: The aim of the present study was to increase reliability by reduction of items and sub-items and to investigate reliability and validity of the reduced questionnaire, Lymphedema Quality of Life Inventory (LyQLI).

Method: Two-hundred patients with different kinds of lymphedema were included and LyQLI was sent to the patients twice, together with SF-36 for measurement of general health.

Results: One out of three sub-items were maintained and four dimensions were reduced into three (physical, psychosocial and practical), in total a reduction from 61 items to 41. One-hundred twenty-six patients (lymphedema of the lower limbs/upper limbs/others 55/40/5%) completed the test-retest. Median respondent time for test-retest was 10 days. *Reliability:* ICC in the physical and psychosocial dimension were 0.88 (P < 0.01) and in practical the 0.87 (P < 0.01). Cronbach's alpha was 0.88/0.92/0.88 for each of the three dimensions respectively. *Criterion validity:* The correlations were moderate for the mean score in the three dimensions in the LyQLI and the eight domains in the SF-36. *Floor-ceiling:* The skewness characteristics show that there is a tendency to a small floor effect.

Conclusion: The reduced questionnaire, LyQLI, is valid and has a good reliability. It can be used in clinic and for cross-sectional studies. Further studies of LyQLI need to investigate the responsiveness in interventional and longitudinal studies.

P38 - PHYSIOLOGICAL PARAMETERS FOR EFFECTIVE COMPRESSION THERAPY OF SWOLLEN LOWER LIMBS- TISSUE FLUID PRESSURE AND FLOW, TONOMETRY

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Background: Mechanical compression is an effective conservative method enabling tissue fluid (TF) to overcome tissue resistance and flow to the non-swollen regions. How high should be externally applied forces and timing of compression to move stagnant tissue fluid Methods. We studied hydraulics of tissue fluid in swollen lower limbs using intermittent pneumatic compression of 30 patients with lower limb lymphedema stage II/III. Inflation pressure ranged from 50 to 120mmHg, sequentially from chamber 1 to 8, inflation time of each chamber ranged from 5 to 20 to 50sec. Skin tonometry was measured. TF pressure was measured in calf and thigh with use of subcutaneously placed pressure sensor. Changes in circumference of compressed limb were measured continuously using a plethysmograph.

Results: Inflation for 5 and 20 sec did not allow to reach TF pressure as in inflated chamber. In advanced cases of lymphedema, to obtain the transmural (TF) pressure of 40 mmHg, pressures in the sleeve had to be raised as high as 150mmHg and timing increased to 50 sec.

Tonometry: Tonometer plunger was pressed against swollen tissue to a depth of 10mm and applied force was read off on the scale. Applied force plotted against pressure gave hints how high massage pressure would be required to move TF. Tonometer force of 1000g/sq.cm generated average TF pressures of 25-40mmHg, of 2000g/sq.cm 50-60mmHg, above 2000g/sq.cm 70mmHg. TF flow at inflation pressure of 120mmHg and 50sec inflation ranged from 1 to 20 ml per inflation cycle.

Conclusions: Pneumatic compression in order to be effective should be based on prior skin tonometry and TF pressure/flow measurements. The optimum inflation pressures seem to be 80-120mmHg and inflation time of each chamber 50+ sec.

P39 - IS INTERMITTENT COMPRESSION EFFECTIVE IN MOVING TISSUE FLUID IN LEGS WITH ULCERS?

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Background: Posttraumatic edema of limbs, developing subsequently to wounds and fractures, is effectively treated by massage moving mobile tissue edema fluid (TF) toward the root of extremity. Excess TF forms natural subcutaneous channels conducting fluid to groin region. The flow pathways end up at inguinal crease, where skin is connected by elastic fibers with inguinal ligament and external oblique muscle. The question arises how effective may intermittent compression be in evacuating TF from the inflamed regions and whether the accumulated TF can form natural subcutaneous channels crossing inguinal crease to hypogastrium and gluteal region. This would facilitate absorption of TF in non-edematous tissues. Such newly created flow pathways would justify treating posttraumatic edema with intermittent compression devices.

Aim: To study the efficiency of evacuation of excess TF from injured regions.

Methods: We used lymphoscintigraphy to study pathways of lymph and mobile TF flow in 30 posttraumatic lymphedema stage II and III pts during pneumatic massage of limb: a) from traumatized tissues to the inguinal region and b) across inguinal crease to healthy non-swollen tissues of hypogastrium and gluteal region.

Results: (i) in 21 pts pneumatic compression pushed isotope in lymph in few still functioning lymphatics and TF in interstitial space toward inguinal region and femoral channel, (ii) in none was isotope crossing inguinal crease or flowing to gluteal area. Densitometry of lymphoscintigraphic images showed increase in thigh isotope from mean 2.4% before therapy, to 25.7% after 6 and 37.2% after 10 months of compression.

Conclusions: Intermittent pneumatic compression is effective in pushing mobile tissue fluid from the injured region and relocating large fluid volumes toward groin. However, it does not cross inguinal crease. This needs redesigning of sleeves adding chamber compressing inguinal area inflated to higher than distal chambers' pressure.

P40 - WHERE DOES TISSUE FLUID/LYMPH ACCUMULATE IN LYMPHEDEMATOUS LOWER LIMB- HINTS FOR MANUAL AND PNEUMATIC MASSAGE AND ELASTIC GARMENT COMPRESSION

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Background: Edema fluid accumulates preponderantly in soft tissues and perivascular spaces but differently in various topographical parts of limb. The knowledge of the sites of accumulation is necessary for effective compression therapy. The aim was to visualize sites with highest accumulation of edema fluid where most of compression force should be applied and to measure its mobility parameters.

Methods: To visualize topographical distribution of edema fluid lymphoscintigraphy with use of ⁹⁹Tc Nanocoll and to measure mobility of fluid pressure with wick-in-needle and strain gauge plethysmography were used. Tonometry of soft tissues and limb circumferences were measured. Studies were carried out in 30 patients with obstructive postinflammatory lymphedema stage II to IV. In group 1 a 30 min manual and in group 2 a 30 min pneumatic massage were applied. Elastic bandaging with Coban 2 (3M) was tried in group 3.

Results: During pneumatic massage and bandage compression, on lymphoscintigraphy fluid was partly retained in foot, visualized fragmented collecting lymphatics, accumulated in calf and popliteal region, reached groin and upper thigh but could not pass through inguinal crease. Tissue fluid pressures were high in mid-calf but low below and above knee and in groin. Flow was low above ankle, high in mid-calf, low at knee level to increase in mid-thigh and low again in groin. Tonometry showed decrease in mid-calf but increase below and above knee and groin. Circumference showed the same pattern. During and after manual massage these changes were less expressed.

Conclusions: Bulk of edema fluid accumulates in foot, popliteal fossa and below groin – sites with loose connective tissue. Selectively more compression force should be applied at these regions to move fluid.

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