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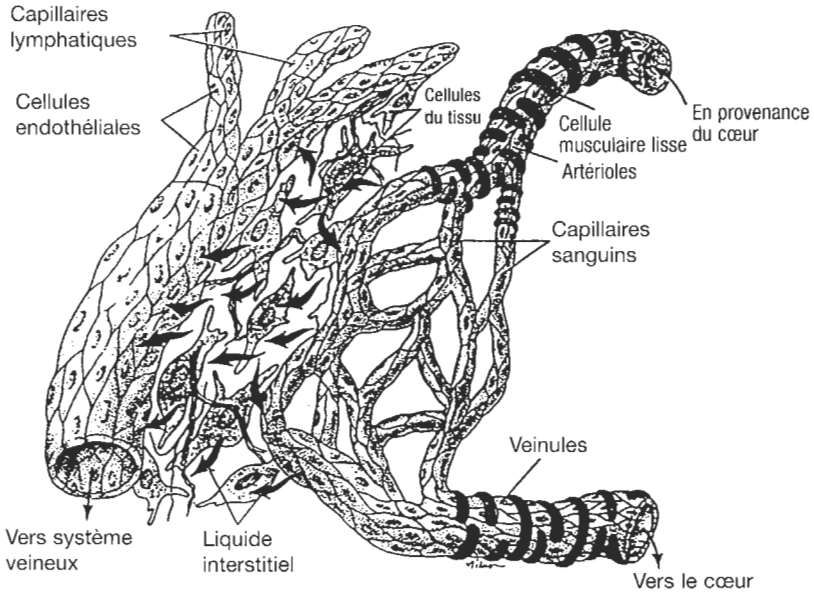
22me Congrès du Groupement Européen de Lymphologie
22nd Congress of European Congress of Lymphology
Paris, Septembre the 20th and 21st, 1996
Faculté de Médecine, 12 rue de l'Ecole de Médecine, 75006 Paris



SUMMARY

Presidential Welcome

Chers collègues,

Permettez-moi de vous souhaiter la bienvenue au 22 ème Congrès du Groupement européen de Lymphologie les 20 et 21 septembre 1996.
Nous sommes heureux de vous accueillir dans notre antique université parisienne qui porte encore sur son fronton le nom d' «Ecole de Médecine» comme à son origine, elle qui a vu tant de célèbres maîtres enseigner l'anatomie, la physiologie et la pathologie des affections vasculaires.
Les deux grands thèmes retenus devraient intéresser tous les lymphologistes : chercheurs, praticiens ou kinésithérapeutes.
Il s'agit d'abord de l'origine même des lymphatiques, là où ils prennent leur source, c'est à dire, comme le suppose Jules Verne dans le «Voyage au centre de la terre» dans une mer intérieure, au plus profond de nous-mêmes : dans l'espace interstitiel.
Mais le deuxième thème nous ramènera bien vite à notre pratique quotidienne. Autour du concept très récent d'insuffisance veino-lymphatique, bien entendu très différent du «phlebolymphedema», nous nous interrogerons sur sa réalité, ses conséquences sociales, sa morbidité et sa thérapeutique. A cette occasion, nous reparlerons de son traitement fondamental, à savoir la contention, à condition que celle-ci soit exécutée avec art. Malgré la période automnale et la rigueur budgétaire qui règnent en France, nous ferons tout pour pouvoir vous en faire oublier les conséquences par la chaleur et l'amitié de notre accueil.

Tous ensemble, nous pouvons faire du 22 ème congrès un véritable succès.

Au nom du Comité scientifique, bienvenue à Paris !

Le Président du Congrès : A. Behar

Dear colleagues,

Welcome to the 22nd Congress of the European Group of Lymphology, 20th and 21st September 1996.
We are pleased to receive you in our ancient university in Paris, wich still has its original name of « School of Medecine» above its entrance and wich has seen so many famous professors teaching the anatomy, physiology and pathology of the vascular system.
The two main topics should interest all lymphologists whether they be in research, clinical practice or physiotherapy.
The first topic is the origin of lymphatics, or, as Jules Verne would say « A journey to the centre of the earth» in that inner sea which is the intersticial space.
The second topic, however, brings us back to everday considerations with the recent concept of venolymphatic insufficiency which is, of course, completely different from phlebolymphedema, and the question of its existence, social consequences, morbidity and treatment. This will give us the opportunity to discuss its fundamental treatment, that is to say contention if carried out satisfactorily.
In spite of automn comming on and the economic situation in France, we will do our utmost to help you forget these circumstances by the warm and friendly welcome which we extend to you.

Together, we can make the 22nd Congress a great success.

On behalf of Scientific Committee, welcome to Paris !

The President of the Congress Committee :
A. Behar

General informations

Registrations

Thuesday september the 19th

□ from 14 to 18 h to Biophysic Laboratory (Cordelier' building), **15** rue de l'Ecole de Médecine, 75006 Paris. Métro Odéon.

Friday september the 20th

□ from 8 h to 18 h in Faculté de Médecine hall, **12** rue de l'Ecole de Médecine

Tel : (33) 01 46 33 31 18 - Fax : (33) 01 42 34 83 13

Venue of Congress

Metro : Odéon
Bus Odéon :86, 87, 63, 96
Bus near Odéon : 21, 27, 38, 58, 70

Language

The official languages of the Congress are French and English. Simultaneous translation is available.

Notice for speakers

Double projection is available, video-tape also. Delivry of slides at latest 30 min. befor the session. Test run is possible. Appointed time is strictly 10 min. for papers, and 15 min. for lectures.

Posters

Will be displayed in the poster-area during one day from 9 h. to 18 h. The size for posters should be the standard one : 70 X 100 cm.

The time-shedule would be sharp.

Certificates

Certificates of attendance and also of fee registration can be collected at the registration desk upon request.

Social activities

Friday september 20

18 h 30 : Cocktail reception for all the participants and accompagnants in the City Hall : Lord Maire welcomin

Night Gala Dinner

Friday night, september the 20th, 20 h.

Harbour «*Port de la Conférence*»,
***Pont de l'Alma* for a cruiser by river Seine in boat : «*Le Parisien*», Bateau-mouche company.**
Métro : Alma-Marceau, bus : 72, 92, 80.

Fee : 500 fr. (French currency)

Social Programme (Accompanists)

Friday september the 20th 1996

Payment during the Congress - Rough fee

Cityrama Tour

Orientation Tour of Paris, morning and afternoon (around 2 h), by double decker motor coach : 150 fr.

Paris Artistique

Visit of Notre-Dame Cathedral and Louvre Museum included, on the morning 9 h 45.
Duration : 3 h 30 - 270 fr.

La Grande Arche et Montmartre

Friday 13 h 45, duration: 3 h 30 - 230 fr.

Paris Seinorama

Discover the monumental Paris (Napoleon's tombs, Seine cruise and Eiffel Tower).
Duration: around 4 h - 290 fr.

Acknoledgements

The scientific committee of 22nd E.G.L Congress wish to thank the following medical and others compagnies for their contributions to the Congress :

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Société Oedema

Special thanks for *Naturalia et Bioliogia* for its supports on Scientific programme

Sessions Programme

Friday September 20

8 H. 30: Opening ceremony - G. Hidden and A. Behar

Session 1

9 H.00 - 10 H. 15:

Intersticial Space and Initial Lymphatics

Chairmen: J.R. Casley-Smith, P. Valensi, A. Behar.

1 – M. Földi, E. Kaiserling, O. Radou, S. Preyer. Abstract p. 11
The « Wick-method yields false values both for intersticial fluid pressure and for intersticial fluid protein concentration ». Lecture: 15 minutes.

2 – J.R. Casley-Smith p. 11
Uptake by the initial lymphatics: how dead is the colloidal osmotic pressure hypothysis?

3 – G. Lagrue, A. Behar, G. Rostoker, A. Maurel p. 11
(Edematous syndromes due to abnormalities in capillary permeability and lymphatic resorption: etiological classification.

4 – J.R. Casley-Smith p. 11
The factors involved in the pathophysiology of œdema: towards a mathematical model.

5 – E. Kerekhofs, A. Leduc, P. Lievens, P. Van der Veen p. 12
Experimentally modulated lymphatic contractions in guinea pig mesentery

Discussion - Final remarks (M. Földi)

Session 2

10 H. 45 - 12 H. 30

Initial Lymphatics - Exploration procedures

Chairmen: G. Lagrue, P. Bourgeois, M. Vaysserat

1 – A. Maurel, A. Behar, G. Lagrue p. 12
Fluorescent microlymphography

2 – P. Kadoo, A.W.B. Stanton, J.R. Levick, P.S. Mortimer p. 12
Quantification of the initial lymphatic vessels of forearm skin by fluorescence microlymphography.

3 – K.H. Bourahla, A. Maurel, F. Cohen-Boulakia, G. Lagrue, A. Behar p. 12
Why the half-time value of resting flux in laser Doppler flowmetry is the best value for evaluation of edema. Towards a next mathematical model. p. 13

4 - M.G. Borzeix, J. Angignard, E. Panconi, S. Bougaret
Comparative anti-edematous activity of Cyclo 3 fort and coumarin in high--protein edema, in rabbits.

5 – J. Sibony-Prat, F. L'Hermite, F. Cohen-Boulakia, J.R. Attali, A. Behar, P. Valensi p. 13
Capillary permeability lymphatic resorption and changes in antidiuritic hormone and atrial natriuretic factor levels in obese women with swelling syndrom.

6 – O. Smagghue, J. Paries, P. Velayoudon, J.R. Attali, P. Valensi p. 13
Cutaneous blood flow and erythrocyte rheological parameters in non insulin dependent diabetic patients

7 – A. Pissas p. 13
Studying the initial lymphatics by injection on cadavers: a stupid nons ense or a real mystery?

8 – O. Stücker, C. Pons, J.P. Duverger, F. Dedieu, E. Leutenegger p. 14
Effects of a combination of coumarin derivatives and rutoside on lymphatic function: videomicroscopy study in rat mesentere.

Session 3

14 H. 00 - 14 H. 30:

Oral discussion from the poster session

Chairmen: A. Leduc, J.M. Fichelle

1 – I.O. Rada, O. Silasi, V. Sântimbreanu, F.C. Rada p. 14
Phlebolymphedema-Realities and uncertainties (Part one and two)

2 – F.C. Rada, V. Sântimbreanu, D. Silasi, O. Silasi, D. Rada, I.O. Rada p. 14
The proteic amount in the intersticial fluid in venous and lymphatic edema

3 – J.A. Alberro, R. Ibanez, E. Laborda, M.P. Santesteban, M.J. Tamès, E. Samaniego p. 15
Lymphedema postmastectomy. Surgical versus conservative treatment

4 – O. Eliska, M. Eliskova p. 15
Venous ulcer-Histopathology

5 – J. Dubois d'Ache p. 15
What about the risk on blood pressure variations, as a result of neck and face lymphdrainage

6 – P. Levicharov p. 24
Surgical treatment of Chyluria

Session 4

14 H. 30 - 15 H. 45

Chylous effusion and arterial restoration edema

Chairmen: G. Hidden, J.M. Cormier, A. Samaniego

Session 5

16 H. 15 - 17 H. 45

Veno-lymphatic deficiency and compression treatment

Chairmen: R. Stemmer, M. Földi, R. Cluzan

Discussion and final remarks

Saturday September 21

Session 6

8 H. 30 - 10 H. 15:

Free papers

Chairmen: A. Pissas, Nuno Grande, J. Pflug

Session 7

10 H. 45 - 12 H. 30:

Free papers

Chairmen: M. Safar, J.P. Brun, J.L. Ciucci

Session 8

14 H. 00 - 14 H. 30:

Oral discussion about the 2nd poster session

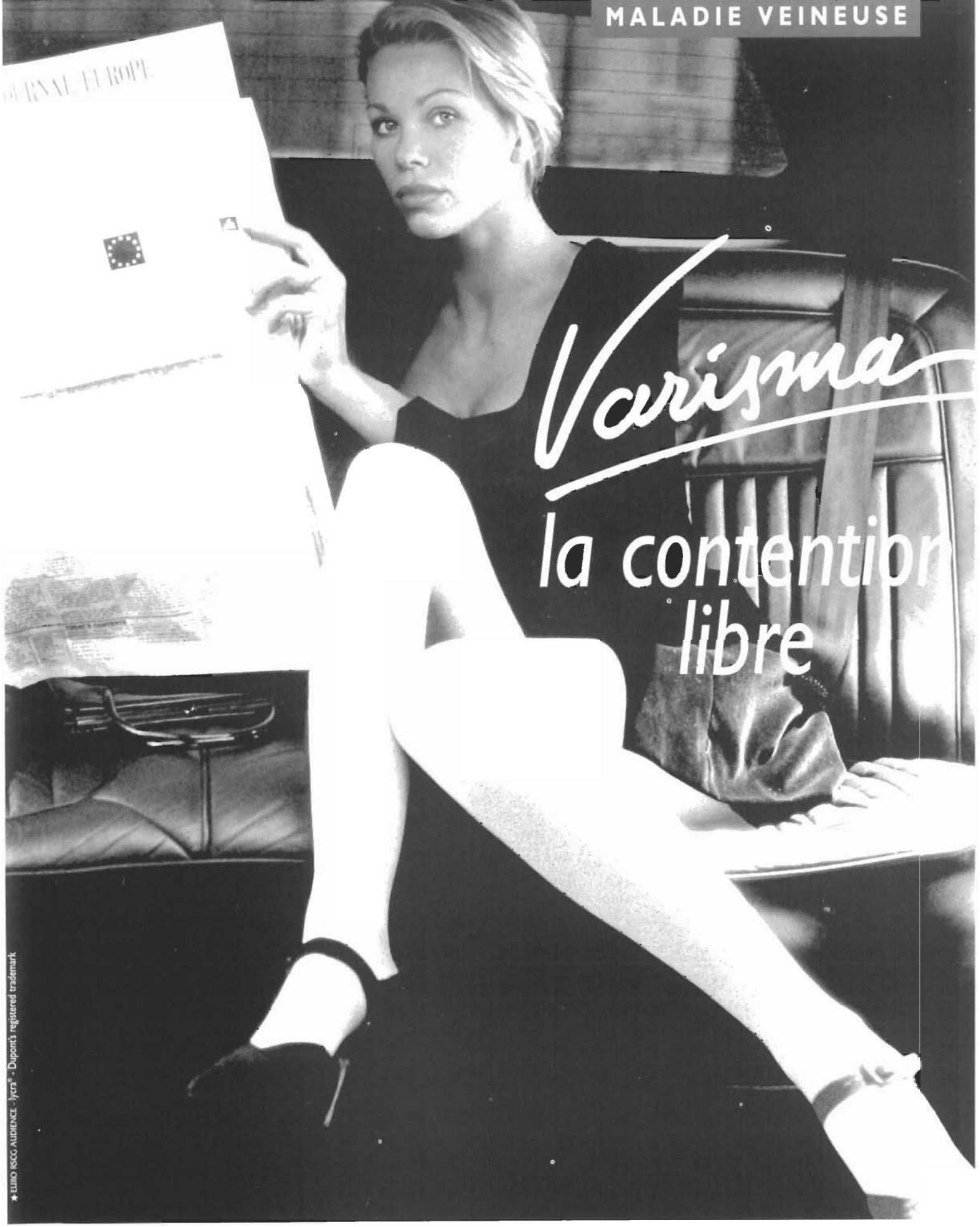
Chairmen: A. Pecking, O. Eliska

15 H. 00:

Closing remarks - A. Behar

16 H. 00:

EGL-General Assembly



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M. FOLDI, E. KAISERLING, O. RADOL, S. PREYER

(Foldiclinic, Clinic of Lymphology, Hinterzarten; Institute for Pathology, Dept. of Histo- and Cytopathology, University of Tübingen, Dept. of Exp. Surgery, University of Tübingen, Dept. of Otorhinolaryngology, University of Tübingen, Germany)

The "Wick-method yields false values both for interstitial fluid pressure and for interstitial fluid protein concentration"

The existence of the Landis-Pappenheimer equation has at all times induced physiologists to reckon with figures in order to calculate the volume of the net ultrafiltrate produced per unit of time. The "wick-method" has been widely used to obtain numerical values for pericapillary interstitial fluid pressure and for the colloid osmotic pressure of the pericapillary interstitial fluid.

Our histological studies have brought evidence to the fact that the "wick-method" yields false, too high values for the colloid osmotic pressure and too low values for the pericapillary interstitial fluid pressure.

THE FACTORS INVOLVED IN THE PATHOPHYSIOLOGY OF OEDEMA: TOWARDS A MATHEMATICAL MODEL

J.R. Casley-Smith
Henry Thomas Laboratory, University of Adelaide, S.A. 5005, Australia

There is a basic problem in the pathophysiology of the oedemas: Pathologists seldom think in Physiological terms and Physiologists seldom think in Pathological ones.

Hence the chronic oedemas have had a moderate amount of study in terms of the non-fluid changes (cells, fibres, etc); the numerical alterations in the (Safety) Factors involved in fluid and protein homeostasis have been seldom studied. By contrast, short-term oedema has been largely studied in terms of these Factors (e.g. raised venous pressure), with alterations in the tissues themselves largely ignored. Yet tissue alterations can have huge alterations on many of the Factors, the reverse also applies, and both kinds of alterations need to be considered to give even a semblence of the complete situation.

A mathematical model has been constructed of the blood-tissue-lymph system, including tissue proteolysis. Such a model is absolutely essential if one is to explore the complexities of such a system: involving some 25 separate equations and 16 Factors, many of which influence each other and even themselves (i.e. are recursive). This model, of course, can prove nothing. However it can give insight into some of the complexities of the system and suggest what is probably important unders some conditions, and what is important under others. These predictions can then be tested. So far, such predictions have coincided rather well with experiment. The other use of such a model is to show us where we have only hazy ideas, instead of well-defined data.

It will be shown that it the concepts of Lymphatic Transport Capacity and of Lymphatic Load, while they are very valuable as ideas and aids to thinking, are actually without any physiological meaning. This is because tissues re-adjust continually to changes in either. These adjustments are so great that one must reduce the number of lymphatics to 10% of normal in order to reduce the lymph flow to 50%.

Attempts to model human lymphoedema have shown that there are many areas in which are data are so poor as to be a huge handicap; yet many of them would be relatively easy to provide. This would lead to considerable improvments, not only in the model, but in the actual measurements of the results of treating patients, and hence to the treatments themselves. While alterations in the numbers of blood capillaries, and in the numbers of leaky pores, affect the volume of oedema, alterations in the "solid" elements are ultimately far more important. Alterations in the tissue compliance are also important.

UPTAKE BY THE INITIAL LYMPHATICS, HOW DEAD IS THE COLLOIDAL OSMOTIC PRESSURE HYPOTHYSIS?

J.R. Casley-Smith
Henry Thomas Laboratory, University of Adelaide, S.A. 5005, Australia

The colloidal osmotic pressure hypothesis was born out of the need to reconcile the, generally acknowledged, findings of a negative tissue hydrostatic pressure and a slighlty positive intralymphatic pressure. Briefly, it is that uptake for most initial lymphatics (not all) under normal conditions (not during gross oedema) is because the lymph in the initial lymphatics has a considerably higher protein concentration, and hence colloidal osmotic pressure (COP), than that in the tissue fluid. It was demonstrated *in vitro* that this would permit a net inwards pressure to be exerted across the open junctions, and that the inflowing fluid will carry protein with it (a "bootstraps" effect). This would cause the lymph to become more dilute, but it would be reconcentrated the next time the initial lymphatics were compressed, since the now-closed junctions are still permeable to fluid, although approximately closed to protein.

There are a number of quite separate experiments in favour of this mechanism. There have also been a number contradicting it. However these latter have almost all (but not quite all) suffered from the defect that the animals were anaesthetised and that there were no variations in total tissue pressure. Since the mechanism can not function without these, one can hardly use such data to suggest it does not happen.

There have been a few other, far more valid, experiments which certainly show it is not a universal mechanism. On the other hand, there have been some which clearly show that the diaphragmatic initial lymphatics increase their uptake of both fluid and protein when the "tissue fluid" has a high concentration of protein. This is just as predicted by the COP hypothesis, but would certainly not happen if uptake was a simple function of hydrostatic pressure difference. It also correlates well with the findings by Taylor et al. showing that a high-protein oedema causes more lymph flow than an (equally severe) low-protein one.

It is proposed that the COP hypothesis is still a valid concept, and that it explains much that is otherwise inexplicable. It may of course be quite incorrect, but there is less evidence against it than in its favour (in many tissues and under normal to mildly oedematous conditions). It deserves being (suitably) tested by more workers.

OEDEMATOUS SYNDROMES DUE TO ABNORMALITIES IN CAPILLARY PERMEABILITY AND LYMPHATIC RESORPTION: ETIOLOGICAL CLASSIFICATION

G. LAGRUE*, A. BEHAR**, G. ROSTOKER, A. MAUREL*

*Polyclinic - CHU Henri Mondor - 94 CRETEIL
** Department of Nuclear Medicine - Hôtel - Dieu - PARIS

Over the past few years, we have studied the clinical characteristics and mechanism of idiopathic oedematous syndromes. The most frequent occurence was in young women and was characterized by oedematous swelling which was always aggravated by orthostatism and heat and was often accompanied by luteal insufficiency with exaggeration in the premenstruel period. In the majority of cases, this syndrome was accompanied by anxiety, an obsession about weight and depressive comorbidity, often leading to an abuse of diuretics and laxatives. The main physiopathological phenomenon is an association of capillary hyperpermeability and lymphatic resorption disorders.

An identical occurence with the same biological abnormality may appear with certain disorders or medication - we have observed it in

- several cases of Clarkson's syndrome, monoclonal gammapathy with cyclic shock
- in a case of Gleich's syndrome, idiopathic hypereosinophilia

These observations suggest that an interleukine may be responsible for the capillary permeability disorder, as indicated in one case by the action of cyclosporine.

Two drugs have been responsible for this same type of oedematous syndrome with the initial predominant disorder of lymphatic resorption:

- certain calcium inhibitors, probably through direct action on the lymphatic pump (Nifedipine)
- mainly Taxotere, perhaps through the secretion of cytokines

QUANTIFICATION OF THE INITIAL LYMPHATIC VESSELS OF FOREARM SKIN BY FLUORESCENCE MICROLYMPHOGRAPHY

P. Kadoo, A.W.B. Stanton, J.R. Levick* & P.S. Mortimer
Depts of Physiological Medicine and *Physiology, St George's Hospital Medical School, Cranmer Terrace, London SW17 0RE, UK.

The initial lymphatic vessels of human skin can be studied by intradermal injection of dextran of M_w 150,000 tagged with a fluorescent dye. The dye is taken up by the vessels which are observed using a fluorescence microscope. We have modified the method as originally described (Bollinger et al, *Circulation* 64: 1195-200, 1981) to improve the delineation of lymphatics and have developed a method of stereological analysis. Ethics Committee approval was granted.

Seven male and 4 female healthy subjects were studied (20-51yr). FITC-dextran (Sigma, diluted to 6% w/v in sterile saline) was infused by a motorised infusion pump into the upper dermis of the ventral forearm (36G needle) at 50μl.min^{-1} for 4min. The site was monitored with a Wild-Leitz fluorescence videomicroscope (magnification x23). Room temperature was 27±1°C and skin temperature 33±1°C (mean±sd). Microlymphangiograms were printed using a videoprinter and were analysed by a line intersection method (concentric circles every 1cm from edge of dye depot on magnified image) to obtain the lymphatic line density, i.e. length of lymphatic vessel in cm per cm^2 skin (L_A, cm^{-1}) at progressively increasing radial distances from the injection site. In addition, since filling was often patchy, an area of maximum filling was identified to measure L_{Amax} (cm^{-1}). The fraction of the surface area of the dermis occupied by filled vessels was obtained by dot overlay (lymphatic area fraction, A_A). The greatest distance from the edge of the depot was also measured ('spread'). Results are given in Table 1. L_A peaked close to the edge of the depot and diminished radially.

Table 1. Initial lymphatic vessels in healthy forearm skin.

	L_A (cm^{-1})[a]	L_{Amax} (cm^{-1})	A_A	Spread (mm)
Male	0.14-12.75	17.60±4.58	0.38±0.06	9.43±3.20
Female	0.22-6.15	14.72±3.81	0.28±0.08	4.38±1.59
p[b]	-	0.18	0.01	<0.001

[a]Range at circles of radii 0.22-1.74cm (males) and 0.26-1.13cm (females). Peak L_A values occurred at 0.4cm. [b]M *v* F, t test.

The method was successfully applied in 2 women with postmastectomy oedema (55 and 73yr). Furthest spread was found to be greater in the affected arm compared with the unaffected. Other parameters were similar in the two arms. L_A of either arm was less than that of the healthy (younger) females.

This method is thus sensitive enough to demonstrate substantially lower lymphatic density in healthy females than in males and will be of value in the study of the skin lymphatic vessels in postmastectomy oedema and other conditions.

WHY THE HALF-TIME VALUE OF RESTING FLUX IN LASER DOPPLER FLOWMETRY IS THE BEST VALUE FOR EVALUATION OF EDEMA. TOWARD A NEW MATHEMATICAL MODEL

M.BOURAHLA, R.MAUREL, F.COHEN-BOULAKIA, G.LAGRUE and A.BEHAR
BIOPHYSIC AND NUCLEAR MEDICINE DEPARTMENT HOTEL-DIEU, PARIS (FRANCE)
POLYCLINIC, HENRI MONDOR HOSPITAL, CRETEIL, 94010, FRANCE

Laser doppler flowmetry (LDF) was used to study blood flow in the tissue. In this device, the electric output signal is proportional to the flux of red blood cells. Usually it is necessary to create hyperemia by a suprasystolic arterial occlusion after the measurement of the basal flu 3 min. later, the reactive hyperemia response was registered. From this curve, we calculate :

T_0 = time when the hyperemic response starts after the release of the occlusion

T_1 = time to reach 50% of resting flux in the early phase of reaction

T_2 = time to reach resting flux in the same phase.

In our series, healthy volunteer subjects have a T_1 value with a mean of 3.5 s ± 0.5 and T_2 = 8s ± 1. Patients with idiopathic orthostatic edema have a T_1 significantly higher. We propose a new mathematical model in accordance with the 2 phases of resting flux; in the early phase, the flu of red blood cells increases with no obstacle and in the last phase, all the vasomotion phenomena act like shock absorbers. In this case, the best function is probably a sigmoid function. The consequences of this propos tion are:

- T_1 is the unique parameter indicative of rapidly rising early hyperemi
- T_2 is not so significant, if this model is correct, because several parameters of vasomotion, have a role.

IN CONCLUSION : THE T_1 value has a significant correlation with hyperpermeability in IOE

- Our model strongly support the importance of T_1 , in edema rather tha the T_2 value

Experimentally modulated lymphatic contractions in guinea pig mesentery

E. Kerckhofs, A. Leduc, P. Lievens, P. Van der Veen
Vrije Universiteit Brussel, HILOK

We studied microscopically the mesenteric lymphatics of 30 guinea pigs under Nembutal and Thalamonal anesthesia. Physiologic conditions were achieved by putting the animals on a homeothermic blanket and by superfusion of the mesenteric loop with a 37° C buffered Ringer solution.

First, we observed the spontaneous contraction rate of lymphatics with a diastolic diameter between 75 and 300 μm. The mean contraction rate over 30 minutes was 5 ± 1.3 contractions/minute. This is in good agreement with other literature data. After the exposure of the mesenteric loop, there was an initial linear decrease of the contraction rate during the first 6 minutes. We can't explain clearly this fact.

We studied also the eventual relationship between the vessel diameter and the spontaneous contraction rate. We found a cloud distribution with a correlation coefficient of 0.09 indicating the complete absence of a linear correlation.

In order to study the excitatory effects of low frequency current pulses, we used lymphatics with a very low contraction rate (max. 2/min). A platinum wire electrode was placed with it's tip at a distance of 200 from the vessel wall. The minimal current intensity was determined to elicit a contraction for different pulse durations between 1 and 1000 ms. We found a hyperbolic relationship with the lowest intensities for pulses between 100 and 1000 ms.

We continued the experiments with a pulse duration of 500 ms and stimulated the lymphatic vessels for 10 minutes with 10 s intervals between the pulses. We will illustrate this procedure with a short VHS-video projection.

Each electric current pulse is accompanied by the release of a set of hydrogen bubbles due to the electrochemical reactions in the tissue. It can be seen that each electric pulse is followed by a lymph vessel contraction. This phenomenon could be observed for at least 10 min without any functional harm to the vessel: after termination of the electrical stimulation, spontaneous contractions reoccured. Our data demonstrate that the contractile activity of lymphatics can be modulated electrically on the condition that appropriate stimulus parameters are applied.

Until now, there is no clinical implementation of this electrical stimulation procedure. On the scientific level, the electrically induced contractions can probably be used to study the effects of lymph vessel contractions on the resorption process of lymph by initial lymphatics.

FLUORESCENT MICROLYMPHOGRAPHY

A. MAUREL*, A. BEHAR**, G. LAGRUE*

*Polyclinic - CHU Henri Mondor - 94 CRETEIL
** Department of Nuclear Medicine - CHU Brousssais - PARIS

Among the methods used for exploring the lymphatic system, those concerned with microcirculation are of special interest. In the laboratory of clinical exploration of microcirculation at the Henri Mondor Hospital, we have developed a technique using fluorescent microlymphography according to the method described by P. Bollinger (Zurich) in 1981.

MATERIAL AND TECHNIQUE

This technique consists of an intradermic injection with a microsyringe of 0.01 - 0.05ml of a 25% dextran solution (with a molecular weight of 150 000) labelled with fluoescein isothyocyanate (FITC - dextran). The examination of the first lymphatic collectors is carried out using a fluorescent microscope (Wild - Leitz), incidental light being provided by a mercury vapour lamp (HBO 100W, Osram). A black and white highly sensitive (1 lux) camera allows registration on a monitor and recorder.

METHOD

The intradermic injection is given in the lateral region of the heel of the foot which is most affected, with the patient in a lateral decubitus or "shock" position.

As soon as the injection is completed, fluorescent passage in the collectors is registered continually for the first five minutes, then one minute out of every five for the next twenty minutes. Thus the speed of passage can be evaluated (time taken for the first half-centimetre), as well as the morphology of the lymphatic network.

This technique was used to study 19 patients suffering from cyclic (CO) or idiopathic oedema (mean age 43.1 ± 2.8 years, weight 62.1 ± 2.4kg, height 161 ± 1.25cm) as compared with 6 healthy female volunteers (mean age 45.5 ± 4.75 years, weight 56.7 ± 2.37kg, height 161 ± 3.45cm). All the women with CO underwent an isotopic blood test of capillary permeability to labelled albumin (Dr BEHAR), mean albumin retention being 13.23 ± 1.98% (maximum 25).

RESULTS

In normal women, the first half-centimetre in one of the four directions was reached in less than five minutes and the network was well individualized with collectors whose diameter, measured on the screen, was evaluated as being less than 60 microns. In women suffering from CO, morphology was considered normal in 14 out of 19 cases. However, in 17 of the 19 cases, considerable stasis was noted, since 10 min. ,and no collector was visible and some only appeared after 20 min.

COMPARATIVE ANTI-OEDEMATOUS ACTIVITY OF CYCLO 3 FORT AND COUMARIN IN HIGH-PROTEIN OEDEMA, IN RABBITS.

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This study was undertaken in order to compare the anti-oedematous activity of Cyclo 3 Fort (capsules) and Coumarin, at the dose of 100 mg/kf P.O. chosen according to the previous data (Borzeix et al. 1995).
Male New-Zealand rabbits (n=7 per group) were used. Oedema was induced under ketamine+midazolam anaesthesia by immersion of a hind-limb in hot water (60° C) for one minute, according to B.P. Lewis procedure (1969). Four hours later, under pentobarbitone anaesthesia, a popliteal lymph vessel was cannulated according to Jonsson & Shimizu (1979) in order to collect lymph at 6, 7, 8 hours post-injury and to determine the lymph flow. The concentration of proteins was measured in lymph and blood (carodid artery) samples. The diameter of the limb as well as the cutaneous fold was measured before and respectively 5, 6, 7, 8 hours post-burning. Rabbits were given the test-compounds at injury, by gavage and 5 hours later, by intra-duodenal administration. Control rabbits were given the same volume (3 mg/kg) of vehicle (CMC 0.2 %).

Thermal injury induced a significant increase in the lymph flow of 7 seven-fold and in the cutaneous fold by 100 %. The diameter of the limb was also significantly enlarged by 35 % and the concentration of proteins in the lymph was doubled, reaching the plasmatic level.

Cyclo 3 Fort reduced significantly the cutaneous fold (- 27 %) 7 and 8 hours after burning whereas the effect of Coumarin reached only - 18 % (N.S.). Cyclo 3 Fort decreased significantly the diameter of the limb (- 17 %) from 5 to 8 hours post-injury whereas the diminution induced by Coumarin was only significant at 6 (- 9 %) and 7 hours (- 13 %). Cyclo 3 Fort as well as Coumarin reduced significantly (- 60 %) the increased lymph flow. This effect is closely related to the decrease hind-limb volume.
Cyclo 3 Fort had no effect upon the increased concentration of proteins in the lymph, but Coumarin induced a retrun to normal values in 4/7 animals.

In conclusion, both compounds exhibit an anti-oedematous activity in high-protein oedema. This effect seems to be related, for Coumarin, to its well-documented proteolytic activity (D. Egan et al. 1990) evidenced in the present study by a decrement in the concentration of proteins in the lymph and remains to be elucidated for Cyclo 3 Fort.

CAPILLARY PERMEABILITY, LYMPHATIC RESORPTION AND CHANGES IN ANTI DIURETIC HORMONE AND ATRIAL NATRIURETIC FACTOR LEVELS IN OBESE WOMEN WITH SWELLING SYNDROM

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- The Swelling Syndrom (SS) was often found in obese women.
- The pathophysiology of this edema is not really known but microcirculatory disorders and hormonal alteration have a role.
We have previously shown that SS is associated with 2 disorders : the excess capillary filtration of proteins and, sometimes, lymphatic resorption deficiency measured by the TC-Albumin test with lymphatic oscillation index.
The aim of the study is to determine further objective parameters able to characterize the swelling syndrom in gynoid obesity.
1° Body composition was studied by a bioelectrical method with a multifrequency device : 51 females with a BMI (Body Mass Index) > 26 kg/m2 and with SS were investigated. The immediate reproductibility was verified by 3 consecutive tests with a mean variation value of 2.6 %. An increase in extracellular water defined by a level > 107 % of the predicted value was found in 45 cases = 88 %. After 30 minutes of walking this excess even more increased significantly > 4 % of the recumbent value.
2° In a large population of 193 obese women with SS, the 99Tc-Albumin test was performed. One of the most important result was a significant negative correlation between the lymphatic oscillation index and the waist hip ratio.
3° In 47 women from this population with both gynoid obesity and abnormal albumin retention, the regulation of the antidiuretic hormone (ADH) and the atrial natriuretic factor (ANF) was investigated.
2 tests of oral water load (20 ml/kg in 10 minutes) were performed on 2 consecutive days. Patients remained in a recumbent position for 4 hours after the load on the first day and upright on the second day : during these tests, free water clearance became positive but increased significantly less in the standing position than in the recumbent one in obese patients. In the same situation, there is not significantly difference in healthy lean volonteer subjects.
ANF activity was evaluated by urinary assay of cyclic GMP : the GMP /creatinine ratio increased significantly after the water load in both obese patients and lean subjects. However this increase was significantly lower in the upright position than in the recumbent one in the 3rd and 4th hour samples in obese patients, versus a trend to a higher increase in standing position than in a recumbent one in lean subjects.
In conclusion = these data suggest that : women with gynoid obesity and swelling syndrom lymphatic resorption of interstitial protein excess could be abnormal.
- Extracellular water is indeed increased.
- The water load induced the inhibition of ADH secretion and the stimulation of ANF secretion in the orthostatic position : are lower.
Microcirculatory changes and these hormonal disorders mechanisms together could contribute to this kind of edema.

CUTANEOUS BLOOD FLOW AND ERYTHROCYTE RHEOLOGICAL PARAMETERS IN NON INSULIN DEPENDENT DIABETIC PATIENTS.

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We have previously shown the high prevalence of alterations in vagosympathetic control of heart rate and blood pressure and rheological disorders in non insulin dependent diabetic patients (NIDD's). Since peripheral microcirculatory blood flow is also under sympathetic control, the aim of this study was to investigate sympathetic vascular control in NIDD's at rest and during three sympathetic activation tests : deep breathing, sitting to standing and Valsalva, and to correlate the results with rheological changes. Forty-two NIDD's and 14 control subjects were studied. Cutaneous blood flow (CBF) was measured with a laser-doppler device. The mean value and the standard deviation of basal CBF at rest were not significantly different in the two groups. In 12 NIDD's the SD value was below the lowest limit found in the controls. During the three tests the reduction in CBF and its downward slope were lower in the NIDD's than in the controls, with the greatest difference occuring during the deep breathing test. During this test the downward slope of CBF was below the lowest control level in 14 NIDD's. The standard deviation of basal CBF correlated with the decrease in CBF during the sitting to standing and Valsalva tests in the control subjects and during all three tests in the NIDD's. In the latter mean basal CBF correlated negatively with erythrocyte filtration index measured with the Hanss hemorheometer (an index of rigidity) and positively with HbA1c. During the deep breathing test the downward slope of CBF correlated negatively with erythrocyte filtration index and the percent decrease of CBF correlated negatively with the aggregation index of erythrocytes obtained with the Myrenne aggregometer. The downward slope of CBF during the sitting to standing and Valsalva tests correlated positively with serum total cholesterol and triglycerides respectively.
This study suggests that CBF assessment by laser doppler flowmetry affords an attractive non invasive way to investigate sympathetic nervous function in diabetic patients. Rheological erythrocyte alterations appear potent factors able to reduce resting CBF and the changes in CBF induced by vasomotor reflexes, and secondarily to increase capillary pressure and capillary filtration.

STUDYING THE INITIAL LYMPHATICS BY INJECTION ON CADAVERS : A STUPID NONSENSE OR A REAL MYSTERY ?

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The author brings his experience of anatomical injections of the lymphatics vessels on corpses (cadavers) : 500 injections of lung, stomach, pancreas, liver, thyroid, esophagus, upper and lower limbs. There are two kinds of visceras : solid viscera as lung, pancreas, thyroid, and hollow organs as stomach, esophagus etc...

The precise technique of injections is described by perfusion or by injection with a syringe according to the organ. The different solutions (substance for injection) are studied. The local conditions are very important to obtain a successfull injection. The position of the hands of the operator is out of contest determinating; Nevertheless, as it is an injection in the wall of the viscera (that is the same principe than in the so-called indirect lymphographies), the two main questions still remain (for two centuries).

1) How does the dye circulate in the vessels and inject the lymphatic system although the subject is dead and there is no physiological circulation?

2) What is the precise histological space where the dye penetrates in the lymphatic system? How does the dye solution overflow the interstitial space or the initial lymphatics?

EFFECTS OF A COMBINATION OF COUMARIN DERIVATIVES AND RUTOSIDE ON LYMPHATIC FUNCTION. VIDEO-MICROSCOPY STUDY IN RAT MESENTERY

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In order to investigate the lymphokinetic properties of a combination of coumarin derivatives and rutoside (ESBERIVEN®) and to understand better the efficiency of this combination in veinolymphatic insufficiency, the effects of this combination and its main components were studied in an *in vivo* model using intravital microscopic mesenteric lymphatic observation. This experiment was carried out in anaesthetized rats with a dextran-induced oedema. This model allowed to quantify the lymphangion constriction frequency and amplitude, the valve motion frequency and lymphatic vessels basal diameter. Oedema was induced before surgery and blood pressure fall was corrected by injection of saline solution (4% of body weight). Lymphatic activity was videorecorded 5, 10 and 15 min after iv injection of either coumarin derivatives (coum)-rutoside (rut) combination (coum 0.75 mg/kg-rut 37.5 mg/kg or coum 1.5 mg/kg-rut 75 mg/kg or coum 3 mg/kg-rut 150 mg/kg) or coumarin (1.5 mg/kg) or rut (75 mg/kg) or saline solution. The differences ($\Delta = t_{10}$ min after treatment - t_0) of lymphatic constriction frequency (LF) or valve motion frequency (VF) in beats per min (BPM) and also, at t_{10} min, the ratio VF/LF and index VFxAmplitude are summarized in the following table:

Treatment	Δ LF t_{10}-t_0	Δ VF t_{10}-t_0	VF/LF t_{10}	VFxAmpl. t_{10}
Control	+0.67±1.03	-0.44±0.65	0.35±0.07	183±53
Coum 0.75 mg/kg-rut 37.5 mg/kg	+1.25±1.16	+0.37±0.50	0.48±0.09	183±51
Coum 1.5 mg/kg-rut 75 mg/kg	-0.12±0.91	+3.50±0.87*	0.89±0.17*	477±92*
Coum 3 mg/kg-rut 150 mg/kg	+3.00±1.07	+2.12±0.97	0.63±0.15	291±74
Coumarin 1.5 mg/kg	+2.25±0.65	+4.87±1.56*	0.79±0.11	249±30
Rut 75 mg/kg	+0.87±1.33	+1.5±0.91	0.63±0.12	281±114

At t_0, mean basal diameter=89.6 µm, mean FL=15.63 BPM and mean FV= 8.12 BPM (NS)
n≥8 rats/group Mean±SEM *: p≤0.05 compared to control

The results showed that, in this model, the effects of coumarin derivatives-rutoside combination on amplitude or frequency of lymphatic constriction are not significant but this combination increased significantly the valve motion VF, the ratio VF/VL and also the index (VFxAmplitude) which reflects the lymphatic work. The effect is more important at the dose of coum 1.5 mg/kg-rut 75 mg/kg and seems to be due to coumarin component at least in the 10 first minutes. This study confirms the interest of coumarin derivatives-rutoside combination in lymphatic drainage as shown by the increase of the valve motion frequency reflecting an increase of lymph transport and by the increase of the ratio VF/LF demonstrating efficient lymphatic constrictions.

*ESBERIVEN® 1 ampoule of injectable solution contains 200 mg of micellar extract [illegible] mg of coumarin derivatives + and 50 mg of rutoside in 2 ml - Laboratoires KNOLL FRANCE - BASF PHARMA

PHLEBOLYMPHEDEMA - REALITIES AND UNCERTAINTIES

Part one

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Phlebolymphedema is frequently diagnosed. This term consists of 2 separate clinical entities with distinct morphopathogenical, morphopathological and physiopathological characteristics: venous edema and lymphatic edema.

We followed between 1967-1996 the clinical and paraclinical evolution of these diseases and the response to therapy in about 5000 patients with unequal or unilateral edema of the inferior limb.

Clinically, the venous edema has an acute onset (thrombophlebitis), is soft, warm and tender, reducible in decubitus. The fluid of this edema drains plentiful through skin lesions. Complications develop slowly: pigmented skin areas of the medial side of the calf in the lower third, varicose dilatations of the veins (inconstantly), skin ulcerations (ulcus cruris), thin integument, rare and fine hair compared to the other calf (positive Rada sign), aching inguinal adenopathy at palpation (in the onset period).

Laboratory findings in the venous ecema fluid (transudate) demonstrate proteinic concentrations (below 10 g/l), similar to the lymph in the calf lymphvessels. The proteinic concentration in the fluid collected from lymphatic fistulas appearing after surgery is below 15-20 g/l. Direct lymphography showed an increased number (2x,3x) of opacified lymph vessels from the onset and during the whole evolution period of the disease.

Only at the site of ulcerations, these vessels present an unequal caliber or are unequal opacified. In all cases, the vessels go almost straight, appear normally, larger, dilateder and present inguinal lymphnodes hypertrophy and no stasis at lymphangiography. Lymphotropic dyes and radiolabeled macromolecules are resorbed faster from the injection site of the affected limb.

Pathology: - thin skin, hypotrophic dermis and subcutis, with hemosiderinic pigment, hypercelullar lymphnodes, lymphvessels of almost normal aspect. Lesions of calves presenting venous edema heal difficult after 10-15 days.

The lymphatic edema presents as charactenstic clinical features: - it is not reducible, shows a slow onset (primary lymphedema), or occurs after an obvious crisis (secondary lymphedema), it is pale and localized distally (primary lymphedema) or proximal (secondary lymphedema) at onset. Its evolution causes hypertrophy of dermis and subcutis, skin pigmentations. Ulcus cruris do not appear, the hair of the affected limb grows thicker and more dense (positive Rada sign) and the inguinal adenopathy is inconstant.

REALITIES AND UNCERTAINTIES IN PHLEBOLYMPHEDEMA

Part two

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Laboratory findings of the interstitial fluid in lymphedema showed higher protein concentrations (25-50 g/l). We observed on lymphographs 3 aspects:

1. hypoplasic lymphvesseis (85% in primary lymphedema)
2. hyperplasic lymphvesseis - tortuous, varicose vessels with prolonged distal stasis (10-20 days) and no circulatory answer by simpathomimetic drugs or α,β blockers administration. In these 2 cases no lymphnodal obstacle was present.
3. large, tortuous lymphvessels with collateral circulation and proximal lymph stasis in the nearest proximity of the lymphnodal obstacle.

Lymphotropic dyes and radiolabeled macromolecules are delayed resorbed and transported, compared with the contralateral side.

The pathological findings show in all cases extensive fibrosis of the dermis and subcutis, ranging from the dorsal side of the fingers/toes to the knee/elbow, lymphonodal hypocellular fibrosclerosis and fibrosclerosis and wall thickening of the lymphvessels and veins. The plagues located on the calves or dorsum of the feet heal rapidly (7-8 days), showing no cheloid formation, but after 10 years these plagues can became enormously hypertrophied and exulcerated.

We didn't analyze all the features that differentiate these 2 edema types, but we can affirm that venous edema is a transudate. The local lymphatic system contributes to the drainage especially of the proteins from the interstitial space (obligatory load) and the carner fluid (facultative load). The local lymphatic system is therefore hyperfunctioning during this stage and it would be wrong to describe this aspect as dynamic lymphatic insufficiency. The lymphatic edema and the stagnating proteins in the interstitial fluid form the dermis and subcutis fibrosclerosis as well as the vascular and lymphonodular fibrosclerosis. More proteins extravasate as the above mentioned proteins build the fibrosclerous tissue.

As a preliminary conclusion we can affirm that the venous edema is a capillary transudate and the lymphatic edema results when the drainage of the extravasated proteins fails. Skin becomes thickened, ulcus cruris heals rapidly and for a long period and edema becomes hard and not reducible in patients with vencus edema and ulcus cruris, which suffer several episodes of erysipelas and cutaneous infections.

Phlebolymphedema is a rare entity for the medical practice pathology. It is mostly encountered in female patients with sequelae after thrombosis of the axillo-humeral vein which underwent postoperative axillary radiotherapy or in patients with postthrombotic syndrome which suffered several severe episodes of cutaneous infections or repeated erysipelas.

THE PROTEIC AMOUNT IN THE INTERSTITIAL FLUID IN VENOUS AND LYMPHATIC EDEMA

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Materials and methods.

We studied proteinic and lipidic pattern both in serum and interstitial fluid and the cellularity in the interstitial fluid.

- 10 patients with acute unilateral thrombophlebitis of the inferior limbs.
- 8 patients with postthrombotic syndrome without trophicity disorders
- 12 patients with postthrombotic syndrome with trophicity disorders of the medial side of the calves
- 3 patients with acute thrombophlebitis of the superior limb
- 12 patients with late secondary lymphedema of the superior limb
- 18 patients with early secondary lymphedema of the superior limb
- 8 patients with secondary lymphedema of the inferior limb
- 5 patients with primary lymphedema of the inferior limb.
- 3 patients with erysipelas of the inferior limb (no lymphedema)
- 5 patients with nephrotic syndrome and edema of the inferior limbs
- 3 patients with heart failure and edema of the inferior limbs.
- 4 patients with hepatic failure.
- 4 patients with lymphatic fistula after excision of the vances.
- 6 patients with cavernous lymphangiomas (puncture).
- 2 patients with posttraumatic lymphocele (puncture)

We obtained interstitial fluid samples by subcutaneous puncture at the limit of the medial and lower third of the antero-external side of the calves or forearms. No infectious complications ensued after these punctures. All patients had no acute inflammatory diseases, except the 3 cases with erysipelas.

For the dosage of the proteins we used the ABBE refractometrical method.

Results.

The total fluid volume gained by puncture in 12 h was:

- 10 - 30 ml from acute thrombophlebitis patients.
- 15 - 25 ml from patients with bilateral and equal edema (cardiac, renal and hepatic edema)
- 10 - 20 ml from patients with postthrombotic syndrome (with edema and no trophicity disorders)
- 8 - 15 ml from patients with postthrombotic syndrome and trophicity disorders
- 2 - 5 ml from patients with late secondary lymphedema of the superior limbs
- 1 - 4 ml from patients with secondary lymphedema of the inferior limbs
- 2 - 3 droplets - 0.8 ml from patients with primary lymphedema

The total amount of the proteins in the interstitial fluid was:

- patients with venous diseases: below 7.7 g/l - 10 g/l
- patients with lymphatic diseases: 17 g/l - 51 g/l
- patients with erysipelas: 52, 61, 68 g/l

The total amount of the proteins in the lymph was:

- 21 - 31 g/l in lymphatic fistulas
- 42 - 53 g/l in lymphangiomas
- 52 - 55 g/l in posttraumatic lymphoceles

Discussions and conclusions.

A considerable amount of interstitial fluid can be gained through puncture in venous diseases with a low protein concentration: between 1/9 and 1/6 of the serum proteins. In lymphatic diseases one can hardly gain interstitial fluid, the proteins of which are 1/4 - 1/2 - 2/3 of the serum proteins. The interstitial fluid can be easily gained in patients with postthrombotic syndrome and trophicity disorders, with ulcus cruris evoluting for years and clinical adenopathy. The proteins in this fluid were significantly lower as in lymphedema patients. These results recommend a reevaluation and analysis of the term of phlebolymphedema, used in the cases with venous diseases.

LYMPHEDEMA POSTMASTECTOMY. SURGICAL VERSUS CONSERVATIVE TREATMENT

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In the majority of lymphedemas , specially in those which underwent microsurgery, surgical and conservative treatment can not be compared in terms of efficacy, conservative medical treatment is always maintained wether surgery is practiced or wether not.
In general postmastectomy lymphedema is well tolerated and responds quite well to drug treatment and physiotherapy. Nowadays big edemas have almost disappeared.
Surgery is possible in most of the cases but the real problem is to decide when it is indicated. Surgical indication will depend on:
- The patient's acceptance of the edema
- State of the lymphatic structures
- Presence of contraindications

Surgical results, even if they are good, do not lead to a total and definitive edema regression. This is why medical and physiotherapic treatment must be continued.
In our experience, the surgical technique to be choosen in the postmastectomy lymphedema is lymphovenous derivation associated to phasciotomy following the biceps internal border.
In the lymphedema postmastectomy, surgery might improve the general status of the patient but we should bear in mind that drug and physiotherapy treatment must be taken periodically according to the disease evolution.

VENOUS ULCER - HISTOPATHOLOGY

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In 23 human bodies of both sexes, the region of the crural ulcer was removed postmortem within 24 hours. In five of these cases, a suspension of barium and minium was injected retrogradely into the veins of the ulcer region before removal, as an x-ray control.

The removed samples were prepared histologically. Then there was a histochemical evaluation and staining for Langerhans cells

The following changes in the structure and patterns of blood capillaries, veins and lymphatics were found:
1/ venules, dilated in some places, closed in others, venous obstruction was usually segmental
2/ capillaries are dilated, often "huge".
They differ in density from the amount of capillaries in the region of the ulcer and on the margin of ulcer.
3/ lymphatics in the base of the ulcer and on the margin are dilated
4/ recanalization of veins occurs in several ways

Langerhans cells - differences dependent on the distance from the ulcer, were found in the number of cells.

Histochemical studies showed a weakened reaction in the region of the ulcer , which argues for disturbed metabolism of vessels.

WHAT ABOUT THE RISK ON BLOOD PRESSURE VARIATIONS,AS A RESULT OF NECK AND FACE LYMPHDRAINAGE

DUBOIS D'ACHE JOEL,TOURNAI,BELGIQUE

The research tends to establish a readable link between the drainage of the neck and face on the Vodder way, and the variations in plus or minus of the blood pressure; the research offers a good statistical ground on patients in institutions, namely fifty patients, where the blood pressure has been taken immediately before, immediately after and five minutes time after the drainage

The observations display that there is a link between lymphdrainage of neck and face but that this link isn't clear enough to identify the unique and universal performing parameter and so to be sure to avoid any increasing of blood pressure for all patients, some other reasons are presumably operating.

Eigth other persons have been followed on the same path but their blood pressures have been taken continuously by computer during the handling. Their results give some opportunity to insist on the duty to apply all handlings to patients to be sure to produce a performing lymphoeffect. In addition, these results do ascertain the previous observations in giving which handling is performing for each patient

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CHYLOUS EFFUSION IN THE THORAX AFTER THORACIC SURGERY

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Between January 1987 and June 1996, 20 cases of intrathoracic chylous effusion were observed. Six were spontaneous due to medical causes (1 chylopericardium and 5 chylothorax) and 14 were observed after thoracic surgery (12 chylothorax and 2 chylomediastina). In 3 cases, chylothorax resulted from a wound in the thoracic canal (after ligature with videoscopy to treat cervical chylorrhage after thyroid surgery in the first case, after the exeresis of a cyst in the thoracic canal for the second case and in the third, after pneumonectomy for cancer invading the smooth muscle of the oesophagus) In 11 cases, the lymph node - pulmonary collaterals were affected from the thoracic canal to the mediastinum (after one pneumonectomy, 7 lobectomies, one mediastinoscopy for bronchial cancer , one lobectomy for an inflammatory pseudotumour and one mediastinoscopy for mediastinal lymph node tuberculosis) In all these cases, intrathoracic chylous effusion could be explained by the normal anatomy of the thoracic canal, not by the existence of any congenital malformation In cases where the collaterals were affected after lobectomy or mediastinoscopy, no surgical solution was required: all were cured with a simple diet based on medium - chain triglycerides.

ASCITES OF LYMPHATIC ORIGIN AFTER LIVER TRANSPLANT IN CHILDREN

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The aim of this study was to observe the frequency, complications and factors promoting ascites following liver transplants (LT), based on a series of 148 carried out on 131 children.

The diagnosis of post-LT ascites was made if the drainage rate was more than 25ml/kg (or >500ml per day) and persisted at least 72 hours after removal of drains. Out of the 123 transplants taken into account, 31 (25.2%) resulted in the complication of ascites (Group I). Group II included 92 LT with no ascites. Ascites was predominantly lymphocytic (669_1104/mm3), rich in protein (32_13g/l) with a low rate of triglycerides. The mean duration of ascites was 25±19 days. Ascitic complications included: infection of the ascitic liquid (35%), respiratory complications (65%), parietal complications (50%), coagulopathy due to loss (35%), functional renal insufficiency (Creat>130umol/l, 35%). There were 9 deaths (29%) in Group I compared to 8 in Group II (p<0.02). Before transplantation, predictive factors of post-operative ascites included: bilirubinemia >300umol/l (p<0.02), TP < 30% (p<0.05) and albuminemia <30g/l (p<0.05). During surgery, the termino-lateral cavo-cava implantation of the liver when reduced (p<0.02) and a quantity of blood transfused after declamping > 50ml/kg (p<0.01) promoted ascites. After transplantation, bilirubinemia >150umol/l, an Asat rate over 2500 UI/L before day 3 and the onset of acute rejection before day 10 were significantly associated with the appearance of ascites (p<0.01, p<0.01, p<0.05 respectively).

The mechanisms of post-tranplantation ascites seem similar to those observed in patients with cirrhosis after gastrectomy and curettage of the hepatic pedicle. In both of these cases, the section of the lymphatics of the hepatic pedicle is linked with the existence of an intra- or extra-hepatic blockage, either permanent like cirrhosis or temporary after LT. An increase in sinusoidal pressure determines an increase in liquid filtration to the interstitial sector, which is secondarily drained to the lymphatics of the hepatic pedicle. The section of the lymphatics allows a continuous flow of non-chylous lymphatic liquid responsible for ascites.

In conclusion, post-operative ascites increases LT morbidity and mortality in children, the type of ascites being lymphatic, non-chylous and of hepatic origin, aggravated by pre-LT hepatocellular insufficiency, a supra-hepatic blockage or disorders such as a primary dysfunction or acute rejection of the transplant responsible for a transitory intra-hepatic blockage.

LYMPHOLOGICAL COMPLICATIONS OF THE SURGERY : SYNOPTIC STUDY AND A PECULIAR VISCERAL EXAMPLE : CHYLOTHORAX AFTER SPLANCHNICECTOMY

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The authors try to give a complete list of the most important lymphological complications of surgery (upper, lower limbs, neck, thorax, abdomen, pelvis, after visceral, vascular or orthopedic surgery). Some of those complications may be avoided and then a preventive attitude could be proposed by the lymphologists to the surgeons. But other complications cannot, probably, be avoided. As we reported many times, our personnal anatomical studies or pancreatic lymphatic pathways, showed us that the terminal collectors are summarized at the posterior face of the pancreas by two big trunks : one right and one left which will constitute "the intestinal lymphatic trunk". Thoses trunks are borne by the right and left retroportal process. After the different studies of DUMONT and al., we demonstrated that pancreatic edema is a lymphatic edema. Here is reported the case of two patients who underwent conservative surgery for chronic pancreatitis. Splanchnicectomy was done. But in those two cases, very big chylous dilatations constituted the two pathways (right and left). For in chronic pancreatitis, the lymphatic system had become, slowly, but in many years a safety valve, fighting against increasing intraductal pressure. In the post-operative course is appeared an important chylothorax. The authors explain the treatment and the evolution.

THERAPEUTIC PROTOCOL FOR OEDEMA FOLLOWING SUBCRURAL ARTERIAL RESTORATION

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The onset of oedema in the lower limbs following surgery for subcrural arterial restoration is frequent. The mechanisms of this form of oedema are linked with arterial restoration, the possibility of venous thrombosis and alterations in microcirculation and lymphatic circulation.

The causes are anatomical, functional, surgical and infectious.

The authors studied these facts from a clinical viewpoint based on a series of 308 patients having undergone arterial revascularization: 268 cases of critical ischemia, 23 popliteal aneurisms and 17 cases of intermittent claudication. 80 cases of oedema were treated with physiotherapy, which is at present the most successful solution.

The prevention of such cases of oedema is also addressed.

Although it would appear that the presence of these cases of oedema following surgery are linked with successful revascularization, it is nevertheless most inconvenient from a functional point of view, usually beginning early and regressing at the 3 to 4 months following revascularization.

Compression with elastic stockings should take into account the arterial situation.

Chylous Ascites after Abdominal Aortic Surgery.

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Englisch litterature has reported 32 cases of chylous ascites after aortic surgery (CAAS) with a described mortality due to CAAS of 13%.

In our group, during a 6 years survey, 1950 patients had an abdominal aortic surgery meanwile 13 patients (12 man and 1 woman) were refered for CAAS (estimated incidence 0,6%) after 8 aneurysmectomy, 2 superior mesenteric artery bypass, 2 aortobifemoral bypass and 1 aortic redo surgery.

Mean diagnostic delay was 22 days. Abdominal distension was the most common symptom. CAAS was diagnosed either by paracentesis (n=7), skin incision leakage (n=5) or explorative laparatomy (n=1).

For nine patients, CAAS was cured by a three weeks program of total parenteral nutrition (3WTPN).

- In 2 patients, the 3WPTM was withold after respectivly 9 and 13 days and a redo surgery: operative ligation of the injured lymphatic vessel was unsuccessfully performed. Finally CSS was cured with with a complementary 3WPTM.
- In one patient, CSSA persisted after 4 weeks of TPM nad was cured by a peritoneovenous shunt.
- One patient had a dietary fat restriction supplemented with medium- chain triglycerides. After a 39 days regimen and CSSA recurrence, a 3WPTM cured the patient.

During the 27 months follow-up, 1 patient died one month later of small bowell infarction due to superior mesenteric artery bypass occlusion.

In our experience, chylous ascites after aortic surgery should be treated by a three weeks program of total parenteral nutrition or peritoneojugular shunt in case of ascites persistance or recurrence.

Venous and Lymphatic Insufficiency : tissular consequences and treatment with compression- elastic support

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Venous (VI) and Lymphatic (LI) Insufficiency define different conditions.
The concept of veno-lymphatic insufficiency translates only narrow bonds that link the 2 systems of waste elimination.
The blood reflux in the venous insufficiency ends to an hyperpressure into the capillary bed resulting into an increased out flow.

The overflow lymphatic functional capacities defined the dynamic lymphatic insufficiency whose oedema me is the most evident clinical event. The new physico-chemical conditions to the level of tissular chanels are responsable for nutritional and waste desorder's elimination where the gradually growing lymphatic dysfonction plays a key role.
The desequilibrium between the lymphatic load and lymphatic capacities by lost of the functional lymphatic capacity define the mechanical lymphatic insufficiency with retention of height molecular weight proteins responsable for rich protein oedema but also for an imbalance of the local cellular homeostasis. This results in oedema, infectious crisis, fibrosis and fat deposition

At the beginning VI and LI are rather different in their histological and clinical expression but with times the involvement of a lymphatic dysfuncion appears more and more in the VI and, if some events seem to be more or less similar between VI and LI (like lipodermatosclerosis) the tissular consequences are, in fact, differents :
- VI gives rise to an atrophic sclerosis and LI to an hypertrophic ones.
- LI is resposable for a fat deposition which do not exist in VI.
- ulcers which are more or less frequent in VI seem to be much less in LI.

Compression is a method of choice and the most ancient treatment for VI and LI (even if the mode of action of such treatments is not completely understood).

Classic rules which determine the compression and his degressive straing are, may be, questionable..
The clinical observation allows to make some notice:
-The pressure arriving to the deep plan depends on the structure of these plans (fat tissue for instance amortizes pressures on venous or lymphatic truncs. It is the case especially at the root of the limbs).
-A force of too heigh pressure collabs the initial lymphatics and can worse oedema.

Much more fundamental studies have to be initiate in order to understand the mode of action of compression on the connective tissue components (cells, fibres, fundamental substances etc) which are modified by VI or LI.

Has one to consider the compression as a good processing?

Jean. Marc MOLLARD. Chambery.

A good treatment must be efficient, achievable and reliable.

Is compression an efficient mean?
Many works show its efficiency in the curative and preventive ways of use.

Is compression an achievable mean?

A retrospective study made by A.I.V.P.(Association of nurses in vascular pathology) realize. in 1995 (1200 files) observes that ,in the evening, 45% of compressions had to be judged as ineffective.

Is compression a reliable mean?

A recent study (500 files) concerning the detection of deppe venous thrombosis after surgery the hip and the knee expresses significant manner the non benefit of compression concerning the thrombo-embolic prevention

The different mistake and faults concerning the use of compression will be developed.

The conclusion focuses on the necessity of a specific teaching on compression to physician para-medical auxilliaries and patients.

Compression in lymphatic pathology and quality of life

Alliot F *+, Launoy R**, Pascot M*, Cluzan RV*.

- The most important patient's and often therapist's preoccupation is to restore the normal volume and shape of the affected limbs.
The patient is not satisfied not only with limb's shape but also with the physical consistency of his affected limbs neither with the body image which have been changed since the appearance of lymphoedema

- Integrated in a complex strategy (Physiotherapy Complexe Decongestive), bandages and compression represent the center of processings.
The bandage reduces the volume through the removing of all mobile elements which are keept into the connective tissue.Multiple layer of ineslastic bandages with additional material (cotton, polyuretan device, etc) are applied from the distal part towards the root of the limb.Under these bandages the pressure applied on the skin at rest is very low and much more strong when the limb's shape changes with mobilisation or specific gymnastic.
Elastic support (compression treatment) prevents the tissular flood by liquids which are not eliminated by the lymphatics. This method can improve the remaining lymphatic function.
The pressure exerted by stokings or elastic sleeves is submitted to the Laplace's law that underlines relationships between elasticity and pressure. Classes of compression are not again unified between the different marks and countries.
Classically, one quotes as Class I : 10 to 15 mmHg, Class II : 15 to 20 mmHg, Class III : 20 to 36 mmHg, Class IV superior to 36 mmHG.
All these classes are useful in lymphoedema treatment but it appears sometimes necessary to precribe elastic pressures weaker or stronger in order to obtain the stability. Switchboard models are varied and their indication must be related to a good clinical understanding.In some conditions like obesity, for children or in particular cases, on measure models must be use.
A good choice of elastic compression allows a stabilization of the limb's volume and sometimes a small swelling decrease.
In very unfrequent cases the elastic support can be remove for periods of time and even no longer necessary for stability. This allow an optimistic view for some patients.
However, compression remains the main key for lymphedema treatment
Unfortunately we can never be sure that, even for a patient having a good treatment's compliance, the compression thechnic can protect definitively against a worsening (for various reasons).

- The patient's views concerning compression is very often a negative feeling. This treatment is feelt as a paradox concerning the patients esthetic demand.
More, it underlines the lymphatic handicap and can be uncomfortable, giving difficultes for dressing.

At the end of the day compression can damage the patient's quality of life.
To make up calculation of this loss of quality of life and to take in charge his consequences besides the treatment of the swelling is one of our actual researche targets.

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Compression for Venous or Lymphatic Pathology

Stemmer R. Strasbourg

The compression processing share by bandages, can be used for these two pathologies, but with important differences.

1 for réabsorption area :
- oedema from venous origine can be reabsorbed through the adjacent venous capillaries only by the straight of compression
- oedema from lymphatic origine can be displace to a more proximal site where functionnal lymphatics remain.
- oedema from venous and lymphatic origine have the same behave than venous edema

2 for the straignht of compression:
-it will be strong for all the oedema of lower limbs
-it will be weaker for these of the upper limbs

3 for the type of permanent compression:
-almost always series for venous and lympho-venous edema
-often made on measure for elephantiasis

4 according to the member:
-the men that walks mobilizes spontaneously its lower limbs ; therefore we have to incite ther walk
-it is necessary always to ask the patients to practice exercises for the upper limbs.

EFFECT OF MANUAL DRAINAGE LIMITED TO THE LOWER LEG VENOUS ULCERS AREA

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In chronic venous insufficiency, the failure of wounds to heal may be related to the high perfusion microangiopathy and to disturbance of superficial initial lymphatic network. Poorly documented evidence suggests that manual drainage (MD) may be useful in the management of venous lower leg ulcers.

The aim of this study is to evaluate the effect of a localised MD on changes in volume of edema (% δV) (measured at the level of ulcer by a strain gauge plethysmograph JSI-SU4), changes in skin microcirculation (as measured by a diode laser Doppler technique Periflux 4001 at unheated skin temperature) and in delivery of local oxygen (transcutaneous pression of oxygene [$tcpO_2$] at 44°C : AVL) in patients with chronic leg venous ulcers.

The MD was limited to 16 min and applied to the lone lower leg venous area of 7 consecutive patients (5 men, 2 women, mean age : 44 years) in supine position.

Mainly due to concentration of moving blood cells, results show a high skin perfusion at 5 cm proximal to the supero-anterior edge of the ulcer. The mean skin blood flow at rest was 29 units. This is three times higher than the opposite leg. At this level but at least 2 cm in the rear of the laser Doppler probe, $tcpO_2$ values are low (41 mmHg).

During the 16 minutes of MD, slow and ample periodic flowmotions reappear while there is no significant variation of $tcpO_2$. At the level of ulcer, a progressive reduction of edema is usually observed. The improvement is -5,2 % δV. The main reduction of edema is observed (-5 % δV) during the 11 first minutes of the MD.

After stopping MD, the improvement of parameters is still present. It persists at 5 min after the end of MD although at a reduced level.

The aim of our study was not to demonstrate that MD accelerates the rates of healing of lower leg venous ulcers. Initial results suggest that localised MD may be useful in reduction of edema and in a temporal return of local vasomotor regulation. However dosage and the size of the area to be treated should be considered in further work.

BODY COMPOSITION, DEXA AND LYMPHOEDEMA

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The purpose of the Body Composition technique is to quantify fat and fat free mass. The application of Dual X-Ray Absorptiometry (DEXA) to Body Composition analysis which appeared in the late 80s, allies the global and regional analysis of Body Composition to the projection of a densitometric image of the whole body. As a side technique derived from X-Ray Densitometry, DEXA is a method of direct measurement of Body Composition exactly as are chemical analysis of corpses or neutronic radioactivation, both hardly accessible techniques. This method consists of scanning the patient's entire body with a X-Ray beam involving two different energies. The measurement of attenuation of these two radiations provides a digitalized picture.Each basic scanned surface (pixel) provides the following information : weight and fat percentage (e.a. Fat Mass and through substraction Lean Mass).

Weight and Fat Mass percentage are obtained pixel by pixel. The attenuation of high-energy X-Ray is used to determine the total mass of each pixel. This provides a "calculated" weight of the patient, which is very near to the actual physical weight. The Fat Mass percentage (FM) of each pixel is calculated by comparing the attenuation's ratio of both X-Ray (high and low energy), to the data provided by the calibration system of the densitometer (variable FM % and variable thickness phantom). The addition of all pixels of a region or the whole body gives as final information the weight and the composition of both the concerned region and the whole body. The Bone Mass is measured at the same time but independently, being the original objective of the DEXA device ; within the bone pixels, the FM% is obtained from the contiguous pixels. The simultaneous evaluation by bi-frequency impedencemetry of the distribution of intra -and extra cellular water avoids to oppose, in our practice, those two techniques, which are in fact complementary. Despite the fact that DEXA provides a picture, it is above all a measurement technique closely connected to a dosage. Accuracy, reproducibility, simplicity, very low radiation exposure , make this non invasive DEXA method to be widely considered as the current gold standard for clinical investigation as it is also not influenced, concretely, by the state of hydratation of the Lean Mass or the Fat Mass. The excellent correlation with the scannographic intra-abdominal fat quantification and the possibility of studies on small animals (rats) make it an indispensible tool in nutrition research..

The reproducibility with a precision of less than 100 g for one limb's weight and the evaluation of limb's adiposity make it the method of choice for investigation of lymphoedema of inferior or superior limbs .

LYMPHATIC DRAINAGE OF THE POSTERIOR FEMORAL SKIN

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50 cases were studied in 30 human fetus.27 cases was male and 23 was female.26 studies was on the right side,and 24 ,on left.

The colorant employed was the BAROTA'S chromatic modified mass.

RESULTS :

3 lymph currents were founded:2 superficial and 1 profonda.Frequency was,in the following order :

1- Superficial posterior internal,50 cases:100%

2- Superficial posterior external,47 cases:94%

3- Deep femoral posterior,45 cases:90%

Direct receptors lymph nodes centers were :

1) Inguino-femoral superficial lymph nodes,50 cases:100%

- Superior external group,41 cases:82%

- Superior medial group,36 cases:72%

- Superior internal group,35 cases:70%

- Safeno femoral internal group,45 cases:86.6%

- Safeno femoral external group,31 cases:62%

2) Femoral perforant superior chain,30 cases:60%

3- Iliac external lateral,12 cases:24%

4) Iliac external medial 5 cases:10%

5) Circumflex iliac superficial or extrainguinal lymph nodes,1 case:2%

CERVICAL VENOUS LYMPHATIC CONNECTIONS OF PULMONARY ORIGIN

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This study was carried out on 360 corpses and 687 pulmonary segments were injected. The terminations of lymphatic vessels of pretracheal right, tracheo-oesophageal, preaortocarotid and left recurrent nerve lymphnode chains were studied in particular . This study shows an absence of large right lymphatic-veins and the existence of numerous lymphatic arches connecting with both homolateral and contralateral cervical venous junctions in 10% to 25% of cases. The intertracheobronchial group of lymph nodes, despite its distance from the supra-clavicular hollows also drained directly into the cervical venous junctions without passing through lymph nodes. Finally, the left mediastinal chains often connect in the arch of the thoracic canal (40% of cases) and reflux due to valvular incontinence of the chyle at this level is the most probable anatomical explanation of post-surgical chylopericardia and certain chylothorax.

THE PATHOPHYSIOLOGICAL ROLE OF THE FASCIAL SYSTEM IN LYMPHOEDEMA OF THE EXTREMITIES.

PFLUG JOSEPH, M. D., GOEPPINGEN, GERMANY

According to the generally accepted pathophysiological concept chronic lymphoedema of the leg and arm represents a monocausal disease resulting from obstruction or insufficiency of lymphovascular system. The clinical course, peroperative findings, CT, MRI and histology have shown that the increased volume of the affected extremity results not only from overaccumulation of interstitial fluid but also from tissular changes. These consist in thickening and loss of elasticity of the fascial system of all layers of the soft tissue coat.
The hallmark of the pathophysiological abnormality is the chronic compartment syndrom i.e. loss of viscoelasticity of the skin and subcutaneous tissue associated with increased interstitial pressure and constriction of the important neurovascular bundles by fibrosed fascial sheets.
The therapeutically most important feature of this fibrosis is its tendency to spontaneous regression after reduction of the increased interstitial pressure. This can be achieved in forms with mild tissular changes by conservative compression treatment, in severe forms the treatment of choice is the adequate release of the constriction by radical excision of the thickened and fibrosed fascial system.

MICROSURGERY IN TREATMENT OF SECONDARY LYMPHEDEMA

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A VIDEO PRESENTATION

Purpose

To present a microsurgical technique for the creation of multiple lymph venous anastomosis in the treatment of post-operative and post-radiation obstructive lymphedema.

Method

Female patients suffering from post-mastectomy, upper extremity lymphedema, were evaluated using (1) isotope and contrast lymphography, in order to assess the level of obstruction and the degree of decompensation and "skin back flow", (2) ascending phlebography to rule out major venous occlusions, and (3) direct endolymphatic pressure (selected cases).

The lymphatic venous anastomosis is created using a surgical microscope and high magnification (x20). Minimal desection is made to avoid any additional trauma. Ten zero prolene sutures are used and an average of 6 lymphatic ducts are anastomosed. The video tape demonstrates the technique.

Results

Fifteen patients were operated using the technique describe (follow up was 2 months to 2 years). There were no operative complications and none of the patients developed erysepelas during the post-operative period. Three patient had massive reduction of the edema with only 1.5 cm or less circumference deference from the normal extremity remaining. Eight patients had good or moderate improvement with 50 to 60% circumference discrepancy reduction. Four patients had only transient improvement and unsatisfactory results.

Conclusion

Microsurgical lymphovenous anastomosis is a safe and minimally traumatic procedure. It can improve lymphatic drainage significantly in about 75% of properly selected cases with secondary post-mastectomy lymphedema.

FREE LYMPHATIC TRANSPLANTS IN LEG OEDEMA

BECKER C. - COGET J.M.

The operation consisting in fatty free flaps containing lymphnodes es performed in 2 or 3 times (relay flaps).
The basis are 1°) the transplanted vascularised lymphnodes are keeping heir activity.

2°) within the first 24 hours, there is a neovascularisation between the remaining lymphvessels of the leg and those of the transplanted flap.

The donor sites are - the heterolateral inguinalcrest lymphnodes based on the circonflex iliac vessels (for iatrogenie cases)
- the cervical flap based on the cervical transverses artery
- the dorsal flap based on the collateral branch of the scapular artery

We operated 25 congenital cases and 39 iatrogenic cases.
The results are showing in 1) <u>iatrogenic cases</u> post adenectomy and radiotherapy.
- degression of the lymphoedema in 90% of the cases withen the first 2 years with normalisation in 40% (moderate cases) of the cases.
- only 3% recurrence of erysipelis
- no degradation after operation.

<u>2) in congenital cases</u>
- 70% of amelioration
- 30% without effect
- recurrence of erysipelis in the cases without results. Perhaps because complete back of lymphatic vessels.

This microsurgical operation needs a good technic and knowlegde of anafomy.(donor sites) but is performed in + of - 1h30 operation. The hospitalisation of 2-3 days and the minimal complication (hematoma - lymphorhea of the donor site during 2-3 weeks) allows us to convice patients to try this treatment when they are resistent to physic treatments.
The operation consisting faty free flap containing lymphnodes (heterolateral if iatrogenic lymphoedema) or lymphflaps performed 2 relay flaps.
The results are showing 1) degression of the lymphoedema in the 2 P.O. years (1cm/month)
2) amelioration in 90% of iatrogenic cases
60% of congenital cases of oedema complete resolving in
40% in iatrogenic cases
20% in congenital withen the first PO. year
no deterioration
3) 3% only of recurrence of erysipelis

PHYSIOPATHOLOGICAL STATUS AND SURGERY IN LYMPHEDEMA

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Surgery might be the solution to lymphedemas produced by alterations in the distribution and pathways of the lymphatic system. The technique to use will be determined by the different kind of lessions in the lymphatic structure. The choice of the technique (exeresis, anastomosis, derivation or transplant) will depend on the existance of lymphatic nodes and patways.
- what would be obtained with these techniques ?
- To what extend the lymphatic return would be normalized ?
In the majority of the cases a subclinic lymphedema is the maximum answer to be obtained.
This is why, conservative medical treatment must not be abandoned. Subclinic lymphedema is a situation where there is a condition of minimum difference between the Total Transport Capacity and the Lymphatic Load in an anatomical region.
Sometimes a wide compensating margin (close to the normality) can be found and in other occasions this margin is so minimum that this situation can be called "Compensated or Asymptomatic Subclinical Lymphedema".
The Total Transport Capacity can be obtained by adding the Compensation Measures to the Residual Transport Capacity. The latest one depends on the lymphatic pathways which remain working after infection, surgical exeresis, radiotherapy, etc.
Practical consequences of the subclinic lymphedema theory.- When there is a short compensation margin, very small lessions might change it, provoquing the edema. This would explain the appearance of tardive lymphedemas.
With a surgical derivation, the compensating mechanisms improve and the total capacity of transport increase. The situation might then change to a subclinic lymphemeda.

LYMPHEDEMA-AREA RESTRICTED LYMPHOMATOID PAPULOSIS

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Lymphomatoid papulosis is a unique cutaneous diffuse T lymphoproliferative disorder that later develope into lymphoma.

We report a case of lymphomatoid papulosis strictly localized on an arm with lymphodema.

CASE REPORT

A woman born in 1920, suffered in 1983 from left breast adenocarcinoma. She was treated by left mastectomy with axillary lymph node dissection, local and regional radiotherapy. Then left arm was affected by post-mastectomy lymphoedema in 1988 ; thus lymphoedema was episodically treated by lymphatic manual drainage and elastic contention.

In 1995 some firm erythematous, occasionally angiomatous, papules appeared ; they were not pruriginous, not painful and their size was 2 to 10 mm. We also noticed few nodules ; one of them was necrotic. All lesions waxed and waned and were strictly localized on the lymphoedematous areas (arm, forearm and wrist). The patient was admitted to the hospital to rule out Stewart-Treves angiosarcoma or cutaneous metastases of breast adenocarcinoma.

Microscopic examination of a biopsy specimen of a papule diagnosed lymphomatoïd papulosis because of diffuse dermal infiltrate composed of few large $CD30^+$ atypical lymphocytes mixed with inflammatory cells (numerous small lymphocytes and some neutrophils and eosinophils) ; some degree of epidermotropism and frequent mitosis were seen. The were no lymphadenopathies. Chest-x-ray and abdominal echography were normal.

A treatment by dermocorticoïds (Diprosone® ointment) was given and no recurrence occured during a 5 months follow up. Then a relapse occured that was treated by oral prednisone which led to a complete remission.

COMMENTS

The lymphomatoïd papulosis was diagnosed in our case because the patient had the usual diagnostic cutaneous criteria of this disease : 1) multiple skin lesions consisting of papules and nodules 2) spontaneous regression of the lesions followed by recurrence 3) no lesions greater than 3 cm 4) no lymphademopathy, no systemic involvement 5) presence of atypical lymphocytes.

Our case is very unusual because the lesions were restricted to the lymphoedematous areas. This unusual localisation of a generalized disease seems not coincidental. Other cutaneous diseases restricted to lymphoedema-area were previously reported, particularly Sweet syndrome, bullous pemphigoïd, Ki-1 large cell cutaneous lymphoma. In these cases the chronic immunodepression induced by lymphoedema may be the cause of the dermatosis. This case was also remarkable for the clinical aspect that may be a differential diagnosis of Stewart-Treves angiosarcoma.

LYMPHOSCINTIGRAPHIC EXPLORATION OF MANUAL LYMPHATIC DRAINAGE EFFETCS. GUIDELINES FOR ITS APPLICATION IN UPPER LIMB LYMPHOEDEMA.

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Upper limb lymphoedema is a very known sequellar of radio surgical treatment for breast cancer. Manual lymphatic drainage (MLD) is generaly employed for its physical treatment. The lymphoscintigraphic exploration of 47 upper limb lymphoedemas compares the views taken after injection with those taken after Manual Lymphatic Drainage. Such comparizon permits to approach the different images of lymphatic insuffisiency and manual lymphatic drainage assesment. Its efficiency is independant of many studied parameters.

The different used pathways stimulated by MLD are visualized. These routes do not respect the anatomic pathways. They are not rectinilear and stereotyped as in normal lymphoscintigraphy but various and tortuous. Abnormal pathways driving the colloïd to internal mammary and axillar contro lateral nodes are noticed.

Consequentially, Manual Lymphatic Drainage technic must be adapted in upper limb lymphoedema treatment. The ways of its adaptation are described in purpose of its improvement.

SURGICAL TREATMENT OF GENITAL LYMPHEDEMA IN MALE PATIENTS

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The different lymphedema locations might show different etiology, local side effects and treatment different. Because of this variability, they are treated separately. Surgical indication and technique selection in the majority of lymphedemas represent a tough problem. Surgery is the first choice technique in male patients witch genital lymphedema and Servelle's total superficial lymphadenectomy is the technique indicated.

We recommend surgery when the volume might be a problem or when lymphangitis and lymphorragia arise as frequent complications.

Physiotherapy shows difficulties for the lymphatic compression and lymphatic drainage.

In our environment, where there is not philaria, the most frequent etiologies are: congenital, secondary to oncologycal treatement (ganglionar resection and radiotheraphy) and as a consequence of infections.

The experience of 8 patients treated in our hospital is described. Six of them underwent surgery (3 congenital, 2 post-tumoral and 1 post-infection). All of them experienced volume increase. Four of them developed lymphangitis, and two of them showed lymphorragia with vesicular lessions in scrotum skin. One of the patients was treated for a cryptorchidism in left testicle and another one for a bilateral hydrocele.

In all the cases total superficial lymphadenectomy has obtained results good enough for considering it the first choice technique.

LYMPHATIC DRAINAGE OF THE EAR

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MATERIAL AND METHOD: This study is based on 30 cases of human fetus: 18 males and 12 females.Right investigation was made in 17 cases,and left in 13 cases.The colorant used was :GAROTA'S modified mass.

RESULTS: 5 pedicles are founded;3 are superficial,and 2 are deep.In followwing order :

1- superficial anterior or preauricular,28 cases:93.3%

2- superficial posterior or preauricular,25 cases:83.3%

3- superficial inferior or suparotid,27 cases:90%

- Internal or submaxilar,5 cases:16.6%

- Medial or jugular external,28 cases:93.3%

- External or cervical ascendants,3 case:13.3%

- Deep anterior or predigastric,26 cases:86.6%

- Deep posterior or retrodigastric,16 cases:53.3%

FREQUENCY DISCOVERY OF LYMPH NODE CENTERS

Temooral superficial:93.3%,jugular external:93.3%,occipital anterior :90%,jugular internal:90%,interparotid:86.6%,auricular posterior:83.3% cervical ascendants:46.6%,transversal cervical:26.6%,anterior fascial: 13.3% and posterior facial:13.3%

VASCULAR PHASE IN LOWER EXTREMITIES LIMPHOSCINTIGRAPHY

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Aim of the study.- To investigate the clinical usefulness of vascular phase in lymphoscintigraphy of lower extremities lymphedemas.
Material and methods.- Scintigraphies of the lower extremities were obtained in 17 patients afected by clinical lymphedema in legs or genital region.
Nanocolloids of human albumin from commercial kit marked with Tc^{99m} were administered subcutaneusly through injection in the first interdigital space of each foot.
Fifty scan views (6 seconds each) were collected during the first 5 minutes and 15 scan views (1 munute each) inmediately after, totalizing 20 minutes of recording. A computerized gammacamera was used in the process.
Results.- Eight of 17 patients did not present vissible lymphatic pathways in any of the scan views and their curves showed slight or no slope. The remaining 9 patients did not present vascular images. Three of them had genital lymphedema. Two of these three patients showed unilateral vascular scan view and the remaining one showed it in both sides.
One patient with clinical lymphedema in both legs showed vascular scan view in only one side. The remaining patients presented scintigraphic visible pathways in the side wich was clinically affected.
Conclusions.- A vascular lymphatic pathway scan view in the first phase of lymphoscintigraphy was obtained in lower extremities affected by lymphedema or connected with a genital lymphedema.

AMBULATORY TREATMENT OF LYMPHEDEMA

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The conservative therapy of limb lymphedema is performed in hospitals all over the world.We would like to publish our experiences with an ambulatory treatment regime of lymphdrainage therapy. We have adopted the inpatient therapy studied in Germany and began the ambulatory type of lymphdrainage regime in 1988. 217 patients were treated in this 8 year period, with manual lymphdrainage and Lymphamat instrument. Results of the therapy were checked by measuring the circumference of the limb at standard points. The greatest decrease in the lower limb was 66 % /mean 17.9 %/, in the upper limb 43 % /mean 18.8 %/.

Main differences between the hospital and ambulatory therapy are the follow

1. Patients are treated and controlled only once a week by an educated lymphdrainage nurse.
2. Elastic bandages are worn every day for months or years. Elastic hosieries are allowed to use only occasionally.
3. Relatives of the patients are taught to treat the lymphedematose limb.
4. The active therapy is lengthened, but it is less intensive than in a hospital treatment, so the difference between the draining and maintaining period of the cure has vanished.
5. The same person treats the patient for a longer period of time,therefor there is no break in systemacity of the treatment as experienced in the hospital therapy cases, when there is a change as the patient leaves for ward.
6. In the ambulatory regime, it takes a longer time to see the results of the treatment than in hospital therapy, but it seems, that it is as good as in inpatient cases.

Case report

Distal lymphovenous bypass for probable lymphatic valvular insufficiency

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Primitive adult lymphedema most frequently results from the decompensation of a lymphatic hypoplasia by an intercurrent episode. We report a case of lower limb lymphedema on a 30 year old patient after knee ligamentoplasty.

This lymphedema is particular by the fact that it decreases in a spectacular way in the lying position. After failure of lymphovenous bypasses of the knee and Thompson procedure, and considering the probable valvular insufficiency, we performed a distal lymphovenous bypass.

This treatment brought relief to the patient for one year but the symptoms reoccured. We performed new lymphovenous bypasses above the previous ones with good results after 3 months.

EFFECTS OF PHISICAL TREATMENT OF PHLEBOLYMPHOEDEMAS LYMPHATIC AND VENOUS SYSTEM

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We have studied 12 subjects suffering from phlebolymphoedema of the limbs (5 men and women, age ranging between 24 and 69 years : 8 of them with phlebopymphoedema of low limbs, in wich 5 with bilateral suffering; four also with phlebolymphoedema of one upper limb

Subjects underwent the following exams before and after the treatment :

- Clinical exam.
- E.C.G. and cardiological visit.
- Usual ematochemic exams.
- High resolution ecography of suffering limbs with measurements of sub and suprafacial tissue and of diameters of interal saphena vein and of common femoral vein.
- Limphoscintygraphy

Patient underwent a phisical treatment consisting in:

- ventilatory gymnastic.
- Manual lymphatic drainage.
- sequential pressure-therapy
- Collective and individual isotonic gymnastic wearing elastocompressure systems (topic socks) (5 daily treatments in a week for 3 weeks) at the end of treatments we have observed.
- Reduction of the circumference of the limb of over 30% in several levels in 9 patients and reduction ranging between 10% and 30% in remaining 3 patients.

With echographic exam we have observed:

- Medium decreasing about 18% of suprafascial tissue
- medium decreasing about 4% of subfascial tissue
- medium decreasing about 9% of caliber of internal saphena vein
- medium decreasing about 30% of caliber of superficial femoral vein
- medium increasing of flow of internal saphena vein after manual lymphatic drainage of at 10%

At the scintigraphy exam we have observed also a medium decreasing of the time appearance of the first proximal limphonodales station of about 15%

The A.A. observe that a physical rehabilitative training make reach an important reductive phlebolimphatic oedema of the limbs demonstred also by instrumental researches, as repeatable, specific and reliable. Conclusions are efficient also for inveterate oedemas. Results were maintained along a time with periodic controls, with permanent elastocompressure or cycles of therapies periodically repeated.

MANUAL LYMPHATIC DRAINAGE FOR CHRONIC POST-MASTECTOMY LYMPHOEDEMA TREATMENT

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Aim of the study. Evaluation before about the effects of the manual lymphatic drainage (MLD) only and after with and without specific compressive bandage (CB).

Materials and Methods. 10 womens afflicted by chronic post-mastectomy lymphoedema (CPL) were studied. MLD was performed by Leduc method. CB was performed by Beirsford bandage (Beirsford AG, Hamburg, Germany). Limb girth measurements were performed with a template in the same site of hand's palm, wrist, forearm and upper arm. The measurements were espressed in the absolute reduction (cm) and percent (%) decrease following the formula:

$$\frac{\text{Measurement-pre} - \text{Measurement-post}}{\text{Measurement pre} - \text{Normal}} \times 100$$

where measurement-pre means the circumference (cm) of lymphoedematous tissue and Normal the circumference of healthy control arm. Edemometer allowed to evaluate the lymphoedematous tissue grade.

Results.

	MLD only	MLD with CB	MLD without CB
Percent decrease of the whole limb	35.7 ± 11.3	41.1 ± 12.2	30.4 ± 15.8
Absolute decrease (cm) of the whole limb	1.4 ± 0.1	1.4 ± 0.6	0.9 ± 0.1

Conclusions. MLD together with compressive bandage is the best treatment.

SURGICAL TREATMENT OF CHYLURIA

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The chylous reflux towards the renal and uretheral lymphatic vessels causes intermittent or permanent release of hazy, milky urine, sometimes containing white clots.

This condition is caused either by congenital anomaly or acquired obliteration of the lymphatic system in its thoracoretroperitoneal segment.

We observed, during the last 28 years, 8 cases of chyluria, five of them were treated surgically. Nephrectomy was inevitable only in one case. All other patients were cured by meticulous resection of the chylous lymphatic vessels in the renal hilus.

The diagnostical procedures and the surgical techniques for chyluria are discussed.

CLASSIFICATION OF DISEASES OF THE THORACIC AND RETROPERITONEAL LYMPHATIC VESSELS.

P.N VUONG, Paris.

the lymph flows in one direction, going from the body tissues to the junction of the lymph and blood systems at the base of the neck. The lymphatic capillaries start from an extensive meshwork of canalicules or initial lymphatics that open into small-sized lymphatics, thence to collecting lymph vessels and finally in the lymphatic trunks :

1°) The thoracici duct starts in the abdominal cavity, runs along side the vertebral column, and opens into the venous system at he junction of the left jugular ans subclavian veins. It drains the lymph from the lower limbs, abdominal cavity, the left side of the thorax, head, neck and left upper limb.

2°) The rigth lymphatic duct receives lymph only from the upper right portion of the body and empties it into the right brachiocephalic vein. Whatever the causes, an obstruction in the lymph drainage leads to a lymphedema in the connective tissues, a lymph transudation into serosa (pleura, pericardium, peritoneum...) producing chylous effusion (chylothorax, chylopericardium, chylous ascites...). Thes changes are associated with severe denutrition. Obstruction of the thoracic and retroperitoneal lymphatic vessels may result from trauma (lymph node curage, post-radiation fibrosis), infections bringing about extensive acute lymphangitis and parasitic diseases mostly represented by the "lymphatic filariasis". Congenital anomalies include fatal pulmonary lymphangiectasia. Lymphatic vessels are the most frequent pathway for dissemination of cancer cells. Primary malignant tumors include exceptionnal lymphangiosarcomas of the lymphatic trunks. Rare benign tumors comprise lymphangioma, lymphangio-endothelioma, lymphangiomatosis and lymphangio-myomatosis.

THE ROLE OF THE LYMPHATIC SYSTEM ON THE PHYSIOLOGY OF THE INTERSTITIAL SPACE OF THE LUNG

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The authors present the results of their personal research on the anatomic distribution of the lymphatic system of the lung. The localization and the ultrastructural arrangement of the initial lymphatic capillaries that are observed in the deep lung of rodents were defined in corrosion casts of lymphatic vessels studied by scanning electron microscopy.

We found that the alveolar walls of the lung are devoid of lymphatic capillaries that are first observed at the frontier between the respiratory bronchioles and the alveolli. Lymphatic capillaries from neighbouring acini fuse to form vessels of larger caliber that accompany the bronchioles and the bronchus. These fusions may form exquisite star-like arrangements. We document the relative low density of endothelial nuclei at the luminal surface of lymphatic vessels of the lung and also the presence of valvular formations. Lymphatic vessels of the deep lung end up at hilar lymph nodes of the lung.

We have concluded that the peri-acinar channels correspond to the initial lymphatics of this organ and that the alveolar septum has no lymphatic vessels. In order to perform the complex and vital functions of gas exchange the clearance of particles that reach the alveolli is made up by resident macrophages. These cells ingest abnormal solid or liquid particles and transport them to the initial lymphatic channels that are located at the bronchiolo-alveolar transition area of the acinus.

Thus the positioning of the initial lymphatics of the lung are likely to modulate the velocity of clearance of inhaled microparticles that the reach the alveolli, as we have described in rodents that were submitted to experimental instillation of calcium tungstate powder into their airways.

IS IT POSSIBLE TO PREVENT APPEARANCE AND AGGRAVATION OF LYMPHEDEMA?

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The Authors report their experience concerning the possibility to prevent the appearance and/or aggravation of lymphedema.
They refer not only to post-mastectomy lymphedema or others related to oncologic, gynecologic and urologic operations, but also to lymphedemas caused by ordinary operations of ectomy of lipomas in the thigh or groin and of varicectomy.
After having underlined the importance of accurate anamnesis and clinical examination of the patient, the Authors point out the role of isotopic lymphangioscintigraphy, performed at short and medium distance after the primary operation (for example, mastectomy), or even before operation in some selected patients. In this way, a category of low, mean and high risk patients, in terms of appearance of lymphedema, can be identified.
The Authors underline, furthermore, the importance not to injure surgically the substitute lymphatic collectors, which, of course, should be protected also against radiotherapy, which certainly plays an important role in the appearance of some forms of secondary lymphedema, including postmastectomy lymphedema.
When risk patients who may develop a lymphedema have been identified, therapeutical preventive procedures are used and we are referring above all to manual lymphatic drainage associated with compressive therapy, where necessary.
Authors believe, moreover, that these methods should be adopted not only after the operation for the primary disease but also before such operation for a period ranging between 3 and 6 days in association post-operatively with a suitable elastic support and daily physiotherapy.
When therapeutic prevention can use microsurgical techniques, these techniques should be reserved to selected high risk patients due to the appearance of a secondary lymphedema, i.e. especially oncologic patients who have to undergo extensive lymphadenectomy and/or receive radiotherapy.
Obviously these methods may be advantageously associated with the conservative techniques of manual and mechanic lymphatic drainage.

ROLE OF MICROSURGERY IN MANAGING LYMPHEDEMA

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The Authors report their clinical experience in the management of peripheral lymphedema by microsurgical techniques. They refer particularly to those lymphedemas which do not respond to conservative treatment, no matter how correctly applied by expert teams of lymphangiologists and physiotherapists.
Their experience consists of 843 patients affected by peripheral primary or secondary lymphedemas. Female sex prevales (1,5:1) and age varies from 2 years to 67, with an average of 27 years.
Arm lymphedemas includes 281 (33%) patients: 27 (9.6%) primary and 254 (90,4%) secondary lymphedemas. Leg lymphedemas are 562 (67%): 264 (47%) primary and 298 (53%) secondary lymphedemas. Primary leg lymphedemas include leg chyledemas[1] as well, also those associated to chyledema of external genitalia (97% of all leg chyledema).
Most lymphedemas were treated by microsurgical techniques at the II (346 patients, 41%) - III (413 patients, 49%) stage (90% of cases), but 25 patients (3%) were operated at the I stage and 59 (7%) at the IV.
Obviously enough, for an appropriate selection of candidate patients for Lymphatic Microsurgery, in all its different types, an adequate diagnostic route is essential. It has to include, in addition to the still fundamental thorough patient history and clinical examination, also an isotopic lymphoscintigraphy[12,13,14], an accurate study of the venous circulation and, if required (in case of angiodysplasia) of the artery circulation. In any case, non invasive investigations are always to be preferred over invasive ones.
In Authors' opinion, conventional direct lymphography, which was so popular in the past, should be applied only in doubtful cases, especially when a chyle-lymphatic gravitational reflux disease is suspected[15].
Finally they believe that, for a proper diagnostic assessment of lymphedemas, before treatment of whatever type, as well as during follow-up, correct comparative measurements of the circumferences of the various segments of the lymphedematous limb are essential as well as photographic records and, above all, volumetric studies.
With a follow-up to be planned at 1, 3, 6 and 12 months and once a year at least for the first 5 years after surgery, positive results from Lymphatic Microsurgery can be achieved in all patients, with greater evidence among patients who have undergone operations at stage II or III. Comparative measurements of the circumferences of the various segments of the lymphedematous limb, volumetric studies and lymphangioscintigraphy[18] are essential to demonstrate the efficacy of derivative and reconstructive microsurgery.

POST-MASTECTOMY "LARGE ARM" PREVENTION AND TREATMENT

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The Authors report their experience in the prevention and treatment of post-mastectomy "large arm".
They underline that although radical mastectomy has given way to local tumor excision and limited axillary lymph node dissection, arm lymphedema develops in 5-20% of these patients, with higher incidence in those patients who undergo also irradiation (30-35%).
Notwithstanding the use of standardized treatment protocols (mastectomy, axillary sampling, irradiation, chemotherapy), the incidence of arm edema is unpredictale.
Time of onset is also variable, sometimes early, or abrupt, latent, delayed many months or years, and often caused by lymphangitis.
The Authors deal with the important role of lymphangioscintigraphy (LAS) in the accurate study of patients both with and without signs of arm edema.
They particularly point out how lymphoscintigraphic investigation has revealed that appearance and severity of lymphedema depends on presence and extent of anatomic abnormalities of lymphatic circulation of affected arm (for example, the absence of deltoid way).
It is, furthermore, reported that it would be useful to study (with LAS) lymphatic circulation of the arm precociously after mastectomy, before the occurence of edema.
Those patients with significant blockage of lymphatic drainage, it is possible to prevent the appearance of lymphedema by means of medical and physical therapeutical methods.
Microsurgical techniques can be used in patients with lymphedema but it is important to use these procedures at the very first stages of the disease (I-II stages), because of the possibility to obtain complete recovery in 90% of patients if operation is carried out at the II stage, remarkable reduction of edema in over 70% if operation is performed at the III stage.
Finally, the Authors report their experience of 254 patients affected from post-mastectomy lymphedema and their clinical outcome.

MUSCULOSKELETAL CONSEQUENCES IN LYMPHEDEMA PATIENTS

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CASE STUDIES:
Four cases of secondary lymphedema reviewed.

Early degenerative joint changes involving the second metacarpal phalangeal joint in upper extremity lymphedema patients, and the first metatarsal phalangeal joint in lower extremity lymphedema patients are described.

In all cases diagnosis is confirmed by clinical examination and by MRI studies.

CASE STUDIES:
Gross muscle atrophy depicted on MRI studies without clinical evidence of muscle weakness demonstrated in severe cases of primary and secondary lymphedema patients.

INDICATION OF RADIOLOGICAL PROCEDURES IN EVALUATION OF EDEMATOUS LIMBS

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Radiological methods used in evaluation of extremity edema:
Plain X-ray
Xeroradiogram
Ultrasonography
Computerized tomography
Magnetic resonance
Radiological lymphography
Phlebography
Arteriography

What we can expect from radiological procedures?
Radiological lymphography, computed tomography (CT), ultrasonography (US), magnetic resonance (MR) can significantly contribute to exact evaluation of different type of edemas and they can contribute to differentiation of lymphedema, venostatic edema and lipedema. Angiography can contribute to diagnosis of edemas connected with vascular malformations. Lymphography - Indirect lymphography (Isovist, Iopamiro, Omnipaque) and Direct lymphography with water soluble contrast agent - can demonstrate pathological changes of peripheral lymphatics and characterise the peripheral lymphatic pathways. Direct lymphography with oily contrast agent (Lipiodol Ultrafluid, Ethiodol). is the most exact method in demonstration of lymphnodes structural changes and in demonstration of collateral lymphatic circulation. US, xeroradiogram in negative mode and especially CT and MR play important role in objectivization of lymphedematous changes of the skin, subcutaneous tissues and muscular layer and can be useful in differential diagnosis of extremity edema.

Indication of radiological methods:
Our approach to indication of radiological lymphography in edema depends on clinical diagnosis and on the result of Patent Blue test (PBT) and on the treatment possibilities. If the PBT is significantly pathological only plain X-ray and/or US/CT/MR/indirect lymphography are recommended and performed. If PBT and CT of pelvis are normal the direct lymphography with water soluble contrast agent followed by oily contrast agent are indicated. If peripheral lymphatic vessels and lymphnodes are normal and CT demonstrates muscular compartment enlargement the colour duplex ultrasonography or phlebography are indicated. If results of all above mentioned test are negative the arteriography is indicated.

TOWARDS NON-INVASIVE ASSESSMENT OF THE AXILLA IN BREAST CANCER PATIENTS - SESTAMIBI SCINTISCANNING OF THE BREAST AND AXILLA

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The importance of axillary nodal pathology in the staging and subsequent management of breast cancer is well recognised, but the question of access to the axilla and the extent of dissection remains controversial. Removal of the axillary nodes and or radiotherapy to the nodal areas is partly responsible for the subsequent lymphoedema which develops in these patients.
Clinical assessment of nodal involvement is notoriously inaccurate. None of the standard or specialised radiological techniques provide reliable and consistent information regarding metastatic nodal involvement. During the last few years several attempts have been made to use scintigraphy to image the axillary nodes. Labelled colloids, labelled liposomes and immuno targeting scintigraphy have been tried.
Since last year we have been involved in a European study to assess the value of Sestamibi [Dupont] in patients with breast cancer. As part of this study we have assessed the axillary uptake and histological involvement.
We studied 32 patients with clinically suspected primary or recurrent breast carcinoma, mean age 55 years [range 33-83]. Five minutes after injection of 740mbq Tc99m Sestamibi into the contralateral arm to the breast lesion the breasts and axillae were imaged.
Patients were divided into two groups. Group A - patients with suspected primary breast carcinoma; and Group B - patients with suspected local recurrence.
There were 25 patients in Group A, 22 of whom had a histological diagnosis of carcinoma and 3 had benign lesions. The Sestamibi scans showed a discrete area of uptake in 20 patients with carcinoma and a diffuse area of mildly increased uptake in 2 patients with benign lesions. Mammography was positive in 13 patients with carcinoma, equivocal in 6 and negative in 3. Mammography was negative in 2 patients with benign lesions and suggestive of malignancy in one patient. Out of the 21 patients with carcinoma, 13 patients had axillary clearance. In 50% of the patients with nodal involvement [8] increased uptake was seen on the Sestamibi scan, and none in the 5 patients without nodal metastases.

CONCLUSION: from this small group we can conclude that Tc99m Sestamibi scintigraphy is proving to be a useful complementary test to mammography. Its use in the assessment of axillary involvement is promising and merits further work.

This work was supported by Dupont and the Catherine Sims Fund

PRESSO-THERAPY, THE PRESSURE... FROM THE MACHINE TO THE PATIENT.

O. LEDUC, J.P. BELGRADO, R. MOENS, L. CLAESEN, A. LEDUC

Wishing to guarantee measurement of presso-therapy at low pressure to their patients, the authors have developped a machine that allows to visualise and to quantify in temporem the alveolar pressure of the sleeves of presso-therapy while functioning.

The alveolar pressures have been measured by introducing in the sleeves of the healthy and oedematic limbs cylindres of different form and measure.

The evaluation of the registered values shows important variations between the pressures given by the manometre of the machines and those registered in the alveolars of the sleeves of superposed tubes.

This study shows the importance of imperative attention that the therapist has to give to the different forms in application of the presso-therapy.

VOLUNTARY MUSCULAR CONTRACTION UNDER PRESSO-THERAPY, APPROACH BY LYMPHOSCINTOGRAPHY

J.P. BELGRADO, P. BOURGEOIS, S. LEFEVRE, O. LEDUC, A. LEDUC

The voluntary muscular contraction under multi-layer bandage having shown a positive effect on the migration of the proteins of the oedema, the authors have examined the question whether the same phenomenon could be observed while muscular contractions were realised under presso-therapy.

Ten male volunteers, young and healthy, after having been informed on the subject, have agreed to submit to a protocol aiming at observing the migration of proteins marked by Tc 99m of experimental oedema.

The injections have been administered subcutaneously, in the first interdigital space and on the anterior side of the forearm.

After the injection the subjects have been submitted to a sequence of presso-therapy characterised by : 20 min. rest, 20 min. presso-therapy at low pressure, 20 min. rest, 20 min. presso-therapy coupled with voluntary muscular contractions of the flexors of the fingers and the wrist, 20 min. rest. Controls of the activity of the injection points and the ganglionic sites have been realised every 20 minutes.

The analysis of the results shows that if the muscular contraction is realised during the phase of compression of the sleeve, there is no migratory flux of the proteins. On the other hand migration is observed at the level of the limb where the injection had been realised in the first interdigital space. After discussion, it seems that this was due to the mobilisation of the tissue, followed by the presso-therapy which could be the origin of this observation.

This study shows the interest of pursuing research in the field of controlled presso-therapy, associated with forms of mobilisation of the conjunctive tissue.

List of Authors and Speakers