

Secondary lymphedema and our management protocol

Le lymphoedème secondaire et notre protocole de prise en charge

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ABSTRACT

Abstract upper limb lymphedema is a frequent pathology, confronted with problems of specific management and often not well codified. In Algeria, patients with this pathology are misdirected. It is a more frequent complication in women with operated breast cancer, with a prevalence of 15 to 65% ⁽¹⁾, affecting one in 5 women, with lower limbs, secondary forms are often difficult to diagnose, since most often presents with bilaterally, unlike in primitive forms, the diagnosis is easy and is made by excess ⁽²⁾. The treatment can only be palliative, by the physical treatment associated with manual lymphatic drainage (DLM) and bandage ⁽³⁾. The objective of the treatment is to improve the functional genes and restore a better quality of life and to cope with a handicap with a strong psychosocial impact, which causes a disturbance of the body image, increased anxiety with depressive affects, impact on the couple's life, and an important obstacle to professional reintegration. The aim of this study is to present our protocol for the management of lymphedema not only in its strategic part, but also to detail the other part of the combined therapy (DLM and bandage) by giving the results of this compatible treatment to the elderly.

KEYWORDS: lymphedema; overall strategy; decongestive therapy; elderly subject; pain; volume.

RÉSUMÉ

Le lymphoedème aux membres est une pathologie fréquente, confrontée à des problèmes de prise en charge spécifique et souvent non bien codifiée. En Algérie, les patients avec cette pathologie sont mal orientés. C'est une complication plus fréquente chez la femme avec cancer du sein opéré de prévalence de 15 à 65% ⁽¹⁾, touchant une femme sur 5, aux membres inférieurs, les formes secondaires sont souvent de diagnostic difficile, vu que le plus souvent se présente avec une bilatéralité, contrairement dans les formes primitives, le diagnostic est facile et se fait par excès ⁽²⁾. Le traitement ne peut être que palliatif, par le traitement physique associé au drainage lymphatique manuel (DLM) et au bandage ⁽³⁾. L'objectif du traitement est d'améliorer les gènes fonctionnels et de redonner une qualité de vie meilleure et faire face à un handicap à fort impact psycho-social, à l'origine d'une perturbation de l'image corporelle, majoration de l'anxiété avec des affects dépressifs, impact sur la vie du couple, et d'un important obstacle à la réinsertion professionnelle. Le but de cette étude est de présenter notre protocole de prise en charge du lymphoedème non seulement dans sa partie stratégique, mais aussi détailler l'autre partie de la thérapie combinée (DLM et bandage) en donnant les résultats de ce traitement compatible aux sujets âgés.

MOTS CLÉS : lymphoedème ; stratégie globale ; thérapie décongestive ; sujet âgé ; douleur ; volumétrie.

INTRODUCTION

Lymphedema is the consequence of a dysfunction of the lymphatic system ⁽⁴⁾, by a stasis of the lymph in the interstitial tissues (*Fig1*), which will result in the enlargement of the limb. This pathology has multiple causes, which is either of malformation of the lymphatic system, most often secondary to a genetic origin; in this case we speak of primary lymphedema.

Either it is secondary to surgery (removal of varicose veins or lymph nodes, for example), treatment of a tumor (such as radiation therapy to treat breast cancer), trauma, or infection. Lymphedema has a considerable psycho-social impact, especially for women treated for breast cancer. Combined decongestive physiotherapy, which is based on the principles described in the 19th century, it is the basis of successful therapeutic management in this chronic condition. The objectives of the treatment are mainly to reduce the volume of

lymphedema, and improve the quality of life of these patients. Physical techniques in physical medicine and rehabilitation represent the mainstay of the treatment of lymphoedemas.

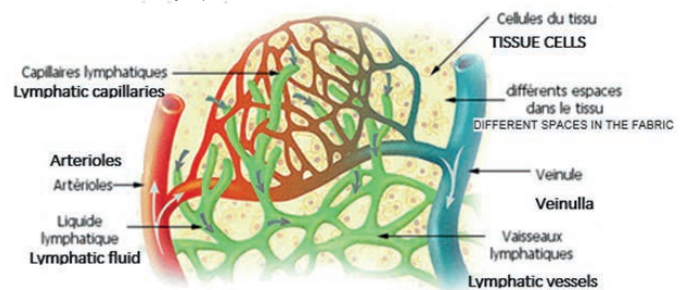


Figure 1 : Les vaisseaux lymphatiques dans les mailles des capillaires artéri-veinulaires
 Lymphatic vessels in the meshes of arterial venular capillaries

EPIDEMIOLOGY

Secondary lymphedemas are the most common, which the leader is lymphedema secondary to breast cancer treatment, with an incidence which varies according to the publications, which can range from 20 to 60%.

According to a recommendation from the National Federation of Cancer Control Centers in France in 2001: More than 98% of patients present with postoperative lymphostasis of the upper limbs. 90% regress spontaneously within a few days: 10% will have lymphedema which will persist 2 ½ months later. We observe 25% of moderate lymphoedemas (difference in perimeter between the two limbs less than 3 cm) and 60% of severe lymphoedemas (difference greater than 3 cm). We conducted a survey in 2012, the date of opening of our lymphoedema unit in the physical medicine and rehabilitation department at the Blida University Hospital, near the oncology surgery department at the Blida anti-cancer center, which informed us on the prevalence of lymphoedema post breast cancer surgery, out of 400 operated breasts, 240 patients may have developed lymphedema, ie 60%.

LYMPHEDEMA SECONDARY TO OPERATED BREAST CANCER

Its onset follows a large axillary dissection, and in the absence of application of the sentinel lymph node technique, which undoubtedly prevents lymphedema ⁽⁵⁾. But it can also appear after radiation therapy, the cause of adhesions. This involvement, most often is proximal initially, and we can only identify it after application of perimeter measures, by reporting more than 5 measurements, compared to the contralateral limb ⁽⁶⁾.

In addition to joint limitations and functional impact, lymphedema can lead to numerous psychological ⁽⁷⁾, social and professional difficulties, which can disrupt body image, upset identity marks, which cause loss of self-esteem, increase anxiety (fear of the future, lymphoedemas as a constant reminder of cancer) and depressive affects, impact the couple's life, and ultimately hinder professional reintegration ⁽⁸⁾.

HOW THE LYMPH PROGRESSES

Lymph is an interstitial fluid present in all organs of the human body, only the brain, spinal cord, bone marrow, retina are devoid of lymph. In intrinsic, several factors intervene, on the one hand, by the autonomous contraction of the lymphangions, 6 to 10 contractions per minute and being able to go up to 20 times / min, and on the other, the valvular apparatus which acts as a pump and which will represent an anti-reflux device. Extrinsically, the lymph will be

able to advance thanks to three factors, mainly muscle contractions, the pressure created by breathing in the thoracic cavity, and the pulsations of the arteries.

Tableau Maladies malformatives et/ou génétiques, anomalies chromosomiques pouvant s'accompagner de lymphœdème (LO)	
Anomalies chromosomiques	Maladies malformatives et/ou génétiques
Trisomie 13	Lymphœdèmes isolés
Trisomie 18	• maladie de Milroy
Trisomie 21	• maladie de Meige
Duplication 11	Syndromes malformatifs complexes
Syndrome 11q-, 13q-	• syndrome de Noonan
Syndrome de Turner, de Klinefelter	• syndrome LO-distichiasis
	• maladie de Waldmann
	• syndrome des ongles jaunes (yellow nail syndrome)
	• neurofibromatose de type I (maladie de Recklinghausen)
	• syndrome LO-hypoparathyroïdie
	• syndrome de Hennekam
	• syndrome d'Aagenaes (LO, cholestase)
	• syndrome de Njolstad's
	Syndromes malformatifs vasculaires
	• syndrome de Klippel-Trenaunay
	• syndrome de Parkes-Weber
	• syndrome de Maffucci
	Déficit en β-galactosidase : maladie de Fabry

FIGURE 2 : LES DIFFÉRENTS TYPES DE LYMPHŒDÈMES PRIMITIFS

DIFFERENT TYPES OF LYPHEDEMA

Abnormalities in the lymphatic system of the limbs can be primary and fall within the scope of agenesis, hypogenesis or dysplasia. Sometimes the disorders are limited to valve incontinence or constitutional dysfunction of contractility (Fig2)(9).

Secondary lymphoedemas are the most frequent. Post traumatic (extensive soft tissue lesions involving a key area of lymphatic drainage), following carcinological resection surgery or for simple biopsy, during direct neoplastic invasion of lymph node relays (breast, prostate, digestive cancers), and infectious lymph node lesions (bacterial, viral or mycotic, Parasitosis (filariasis), or when they are secondary to venous insufficiency. Sometimes lymphedema follows radiotherapy or liposuction (Fig3)(10).



FIGURES: THE DIFFERENT TYPES OF LYMPHOEDEMAS TREATED IN THE MPR CHU BLIDA SERVICE

DIFFERENT TYPES OF LYPHEDEMA

The patient's complaints are most often in the form of pain in the type of heaviness of the limb, which forces us to eliminate tumor invasion, deep vein thrombosis, axillary lymph node recurrence in the case of operated breast cancer, or neuropathy intercostal or by toxicity secondary to chemotherapy. We come to know the different stages of the progression of lymphedema, according to the classification of the "International society of lymphology), which are in 4 stages:



Lymphœdème secondaire au néo du sein opéré

Lymphœdème sur angiome



FIGURE4 : POSITIVE STEMMER SIGN

LYMPHOEDEMA HAS 3 STAGES (INTERNATIONAL SOCIETY OF LYMPHOLOGY)

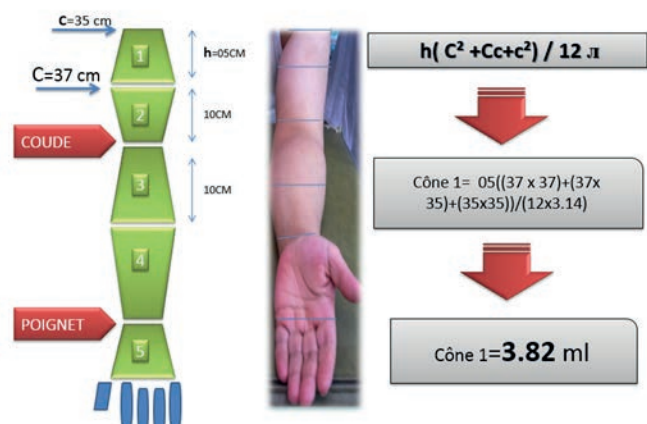
Stage I: Reduction of edema by raising the limb.

Stage II: Persistence of edema by elevating the limb

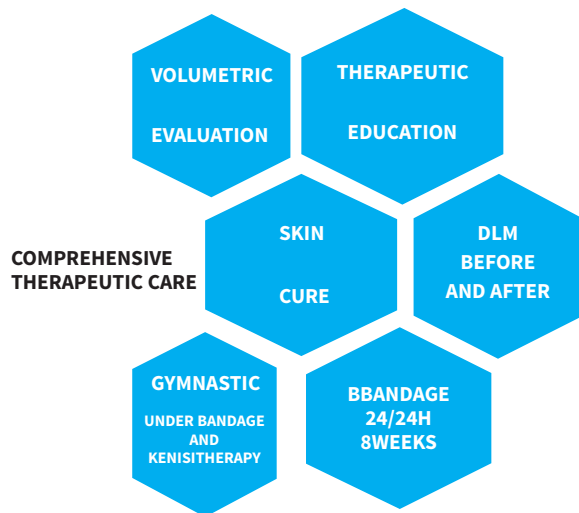
Stage III: Trophic disorders (elephantiasis. Severe fibrosis, skin damage, infections).

The diagnosis of lymphedema is essentially clinical, by Stemmer's sign (Fig4), which is pathognomonic (impossible to wrinkle the skin on the dorsal surface of the 2nd toe (11). The joint assessment will look for a limitation of the range of motion of the affected limb, which can be secondary to an obliteration of the collectors, initially gaping which were responsible for the lymphorrhea, often in the case of an operated breast cancer, is at the origin of the lymphatic cords. These cords are at the origin of limited flexion and external rotation of the shoulder and elbow extension (12). Functional assessment in practice responds to several questionnaires on quality of life, the best known is the EORTC QLQ-C30 scale, which allows a physical, psychological and functional measurement in cancer patients. In addition, fatigue is measured by the MFI-20 scale (13). The evaluation and measurement of the volume of lymphedema is done reliably and reproducibly by volumetry.

Thus the member is assimilated to a set of truncated cone, and the volume will be measured by calculating the volume of each cone, according to the following rule:



SCHEMA1 : CALCULATION OF THE VOLUME



SCHEMA 2 : DIAMAND OF MANAGEMENT STRATEGY

$h (C^2 + Cc + c^2) / 12 \pi$ (C: Large circumference of the cone; c: Small circumference; h: interval between 2 measurements) (Diagram1) ⁽¹⁴⁾.

ETIOLOGICAL EXAMINATION

Paraclinical exploration with aetiological aim in lymphoedemas is essentially based on isotopic lymphography, which is an examination of choice. It is based on the injection of a technetium-99-based colloid product into the back of the foot or hand, so the lymph flow will be followed along the path to the root of the limb. This examination is for morphological and functional purposes. Computed tomography has an interest in looking for abdominal or pelvic causes, and also in distinguishing between lymphedema and lipedema or edema of venous origin.

TREATMENT AND THERAPEUTIC STRATEGY

The management of lymphedema, in all its forms, is based on a comprehensive multifactorial strategy (Diagram 2). This strategy is based mainly on complete decongestive therapy (“DLM” lymphatic drainage and multilayer bandage).

This care management is obligatorily preceded by health and therapeutic education, in which the therapist, whether he is a PMR doctor, or from another specialty, must instill in the patient the essential bases of a healthy lifestyle, and those of our multifactorial care (the principles of drainage and multilayer bandage, and it is preferable that a third person attend this therapeutic education to accompany the patient at home). Examination and evaluation of the limb by the centimeter method is the first step to take in order to measure volume (Fig4). This centimetric measurement of the limbs must be observed before, during and at the end of the treatment of lymphedema in order to control the progress, and all the data will be reported on a pre-established sheet (Diagram 2). This decongestive therapy, based on DLM manual drainage, is the only treatment currently recognized, which includes different techniques that must be combined, such as call drainage and resorption drainage. This therapeutic strategy includes two stages, the first called intensive, its objective is to reduce the volume of lymphedema by up to 60%, a criterion for the success of such treatment.

The second step, is maintenance, its goal to maintain the results obtained in intensive phase.



FIGURE6: THE ESSENTIAL STEPS IN THE MANAGEMENT OF LYMPHEDEMA

DLM uses two types of maneuvers. First, the take-off maneuvers are put forward, which are carried out to accentuate the contractile movements of the lymphatic pathways (lymphangions), in relation to the territory that will be affected by the drainage, and allow the opening of the collectors, which go in turn, drain the lymph by suction. These maneuvers are followed by resorption maneuvers, the effect of which is concentrated on the initial lymphatic pathways, where we will witness an activation of the lymphatic pumps, represented by a succession of anchoring of the ulnar border of the hand, associated with traction. And an unwinding of the hand, to apply light pressure, going towards the proximal parts of the limb (Fig6).

In the same strategy, the semi-elastic bandage, often with bands at 30% elasticity, specially designed for this, and which should respect manufacturing standards according to recognized certification, such as ASQUAL (French), RAL (German) or FDA (American).



FIGURE7 : SEMI ELASTIC BANDAGE

This involves placing, without tightening them, on a padding made either of cotton (wadding) or of simple or honeycomb foam, starting with the distal part of the MS (hand) (Fig7). These tapes are called monotype multilayers. gymnastics and physical exercise under bandage, contribute to an increase in lymphatic flow and the absorption of proteins. This improves the efficiency of muscle contractility and the lymphatic pump (Fig8). Skin care plays an important part in this therapeutic strategy, in order to treat infectious entry points, such as traumatic wounds, intertrigo inter toe, ingrown toenail, and also to avoid risky procedures.

The other goal is to hydrate the skin to prevent breakage, with zinc oxide (oxyplastin). In the maintenance phase of the gains obtained, elastic compression is necessary, which should be worn all day and every day, and not at night (Fig9). These restraints are changed every 3 to 4 months (Fig9). Pressotherapy remains an interesting means for late use, after decongestive therapy, and which each time must be combined for maintenance, with a multilayer bandage, at a pressure of less than 30 mm Hg.

The benefits of this strategy are in particular on pain (heaviness of the limb), where particularly in the elderly, the gain is more notable and statistically significant, according to our observational study CHU Blida (2019) on 62 patients (14 subjects beyond 60 years and 49 less than 60 years) an average

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NOM :	PRENOM :	AGE :			
N° DE DOSSIER :	TEL :				
Côté : droit <input type="checkbox"/> gauche: <input type="checkbox"/> Date de survenue du Lymphoedème					
Type de chirurgie :	Dr :	statut tumoral : N EC BDR RH			
Nombre de cures de Chimio :	dernière cure :				
Dose de Radiothérapie :	Date de dernière séance :				
ATCDS :					
Mensurations circonférentielles :					
Date	BRAS 1S	droit	gauche		
	BRAS 1D				
	COUDE				
	A BRAS 1D				
	POIGNET				
	MP				
Peau:					
Mobilité articulaire:					
Mensuration volumétrique		Nombre de séance :			
Volumétrie	Bras :Cône1	Bras :Cône2	Avt Bras : Cône 1	Avt Bras : Cône 2	Cône de Main
1 ^{er} Séance					
Dernière Séance					
Satisfaction du malade en fin du traitement EVA =					
Fiche de suivi des malades avec lymphoedeme secondaire au traitement du cancer du sein. Service MPR CHU Blida					

FIGURES 5 : THERAPEUTIC FOLLOW-UP SHEET

age of the sample is 52.52 years ± 11.04, of which the median gain in analgesia in elderly subjects is 60mm on pain VAS, and 40 mm in subjects less than 60 years old. Satisfaction with the treatment is 80mm on EVA-satisfaction, in the elderly and 70mm in those under 60 years old. On the other hand, the gain in volume is insignificant in the elderly (180mmHg in the elderly and 250mmHg in those under 60 years old)



FIGURES : LYMPHEDEMA AND GYMNASTICS



FIGURE9 : LES CONTENTIONS ÉLASTIQUES (VARISAN DE CIZETA)

CONCLUSION

The management of lymphoedema is standard for all types of lymphoedema, and not specific to the elderly. It is based on a multidisciplinary therapeutic project, the essential element of which is multifactorial decongestive therapy. Education and practical advice are essential in order to obtain the motivation of patients necessary for the management of regular and prolonged medical monitoring of these chronic pathologies represented by lymphoedemas. The results of this treatment are notable with particularities in the elderly, in terms of pain and volume.

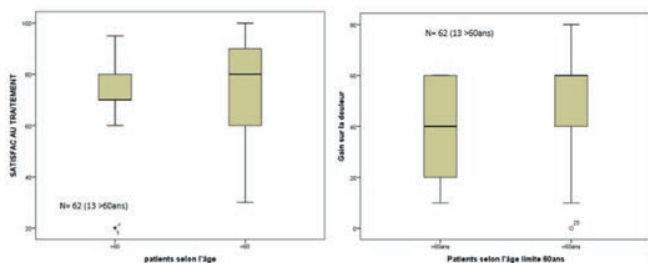


FIGURE10: THE SPECIFICS OF THE RESPONSE TO TREATMENT OF LYMPHEDEMA

BIBLIOGRAPHY

- Ferrandez J-C, Bouchet J-Y, Richaud C, Theys S. Recommandations kinésithérapiques basées sur les faits du traitement des lymphœdèmes des membres. *Kinésithérapie Sci.* 2012;(534):17-31.
- Enquête en médecine générale sur les.pdf.
- Gironet N, Baulieu F, Giraudeau B, Machet L, Toledano C, Tiguemouline J, et al. Lymphœdème de membre: Critères prédictifs de l'efficacité du traitement physique combiné. In: *Annales de Dermatologie et de Vénérologie.* Elsevier; 2004. p. 775-779.
- Ferrandez J-C. Physiopathologie du système lymphatique et implications kinésithérapiques dans le traitement des œdèmes. In: *Annales de kinésithérapie.* Masson; 2000. p. 247-250.
- Arrault M, Vignes S. Facteurs de risque de développement d'un lymphœdème du membre supérieur après traitement du cancer du sein. *Bull Cancer (Paris).* 2006;93(10):1001-1006.
- Alliot F, Launois R. Lymphœdème et qualité de vie. *Rev Médecine Interne.* 2002;23:431s-435s.
- Chachaj A, Malyszczak K, Pyszel K, Lukas J, Tarkowski R, Pudelko M, et al. Physical and psychological impairments of women with upper limb lymphedema following breast cancer treatment. *Psychooncology.* 1 mars 2010;19(3):299-305.
- The psychological morbidity of breast cancer-related arm swelling. *Psychological morbidity of lymphoedema - Tobin - 1993 - Cancer - Wiley Online Library [Internet].* [cité 31 déc 2019]. Disponible sur: [https://acsjournals.onlinelibrary.wiley.com/doi/abs/10.1002/1097-0142\(19931201\)72:11%3C3248::AID-CNCR2820721119%3E3.0.CO;2-Z](https://acsjournals.onlinelibrary.wiley.com/doi/abs/10.1002/1097-0142(19931201)72:11%3C3248::AID-CNCR2820721119%3E3.0.CO;2-Z)
- Van der Putte SC. The pathogenesis of congenital hereditary lymphedema in the pig. *Lymphology.* mars 1978;11(1):10-21.
- Risk of lymphoedema following_breast_kc.pdf.
- Gironet et al. - 2004 - Lymphœdème de membre Critères prédictifs de l'ef.pdf.
- Carpentier PH. Physiopathologie des lymphoedèmes. *Rev Médecine Interne.* 2002;23:371s-374s.
- Ferrandez J-C, Ganchou PH, Theys S. De l'éléphantiasis au lymphœdème actuel. Description et traitement. Qu'avons-nous inventé ? *Kinésithérapie Rev.* nov 2019;19(215):22-9.
- Ferrandez JC, Serin D. Lymphoedeme du sein. Remarques et propositions thérapeutiques. Utilisation des coques de compression. In: *Annales de kinésithérapie.* Paris, Masson, 1974-c2001.; 1995. p. 72-77.