

European Consensus

REHABILITATION AFTER BREAST CANCER TREATMENT

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EUROPEAN CONSENSUS

Rehabilitation after breast cancer treatment

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INTRODUCTION

Rehabilitation after treatment of breast cancer is a decisive stage for the patient, both physically and psychologically. The rehabilitation process addresses not only shoulder mobilisation re-education but also the physical treatment of other problems which can suddenly develop during hospitalisation or at a later stage; even many years later.

The therapeutic consensus was established from meetings and contacts with therapists from various European Treatment Centers. (cf listing p. 22)

The International Society of Lymphology produced the first consensus document on the physical treatment of oedema in 1995 and was adapted in 2003⁽¹⁾ Oedema of the upper limb can cause major physical disability but can also cause other disabling effects which affect normal lifestyle. The consensus document is therefore not confined to the treatment of the oedema but also considers the various problems of rehabilitation linked to the entire treatment of breast cancer.

ARM OEDEMA

This is recognised due to an increase in size of one or both arms (if bilateral surgery has taken place) and can extend to the upper part of the trunk, due to the accumulation of interstitial fluid caused by insufficient drainage⁽²⁾. Oedema develops due to an inadequate drainage system and not overproduction of lymph^(2,3). Also following surgery and usually radiotherapy, the capacity to remove the lymph through the lymphatic system is reduced compared to the production of lymph⁽⁴⁾.

Clinically, oedema is present when the arm volume increases more than 10% of the contralateral or the healthy side⁽⁵⁾.

The sensation of increased size of the fingers is experienced by more than 70% of post surgical patients⁽⁶⁾ whilst 30% will develop an arm oedema⁽⁷⁾.

This feeling may not be due to swelling but may also be the consequence of superficial axillary nerve changes.

At this initial stage of development, there is an abnormal localised accumulation of fluid loaded with molecules of different sizes. Amongst them, the undrained macromolecules represent the catalysing agent of an inflammatory process and the oedema is at all times an inflammatory centre^(8, 9,10).

The local heat in addition to the stasis favours the bacterial culture and a secondary inflammatory process is initiated. The lymphoedema can occur immediately or many years after surgery and may be of gradual or suddenly onset without any obvious cause.

What are the risk factors?

After breast cancer treatment, premature onset of oedema can occur within the first 3 months after surgery or later. It rarely appears in the first week post operatively but can occur 20 years later without any apparent reason!

The risk factors are numerous.

The first risk factors to be avoided are the ones which are sometimes caused by the health care team. Any trauma of the limb during or post-surgery must be totally avoided.

On the operated side, perfusion, blood tests, intra-venous injection, acupuncture, thermotherapy, shock manipulation, insertion of an arterio-venous shunt in case of dialysis should all be avoided.

Radiotherapy: we advise to cover the delto-pectoral groove with a protective shield during radiotherapy, wherever possible. The lymphatic way of Mascagni, present in more than 76% of patients⁽¹¹⁾, is located at this level and is sometimes the only possible drainage route of the arm after breast cancer surgery.

The scar formation⁽¹¹⁾: fibrosis of the axillary scar in addition to radio-dermatitis may reduce the possibility of upper arm drainage.

The inflammatory rheumatism of the wrist can start or assist development of oedema.

The progression of the cancer can spread progressively to the remaining nodes.

Patient involvement and understanding is very important to reduce the risk factors.

Excess weight: the type of diet is not a risk factor but excess weight does have a direct link to oedema. The cause of this is unknown but reduced activity is a likely cause.

It is recommended to maintain body weight to below a BMI of 25.

The patient should avoid:

- *local wounds:* the careful disinfection by the use of alcoholic solutions is strongly recommended;
- *wearing jewellery or watches on the affected arm;*
- *dish washing without gloves:* caustic soaps are dangerous for the skin;
- *extensive exposures to the sun* which can spread erythema;
- *to carry heavy weights* inducing the compression of the axillary vein;
- *using the affected hand to introduce or remove the dishes from the oven:* contact and burns;
- *wearing tight clothes:* wearing a bra with narrow straps and a heavy prosthesis can restrict drainage;
- *long flights:* the decrease of the pressure assists the filtration of fluid. It is advisable to wear a compression garment during long flights.

However the patient must:

- take care of the limb with good skin care, moisturising and nail care;
- wear compression garments when they are prescribed;
- maintain a healthy body weight.

WHAT ARE THE PATIENT SYMPTOMS?

Tightness of the skin and heavy arm.
Sudden pain if sudden onset (no pain when if slow onset).
Tingling or the wristwatch becoming tight.
joint pain, especially in the shoulder.
Localised heat.
Occasionally lymph may flow through the skin pores.
(lymphoerrhoea)

Lymphoedema staging ⁽¹⁾

- Stage 0** Subclinical state: swelling is not evident despite impaired lymph transport
- Stage I** Represents early onset of the condition where there is accumulation of tissue fluid that subsides with limb elevation. Oedema may be pitting;
- Stage II** Limb elevation rarely reduces swelling and pitting is manifest;
- Stage III** Tissue is hard (fibrotic) and no pitting. Skin changes such as thickening; hyperpigmentation, increased skin folds, fat deposits warty overgrowths develop.

Classification of severity

in comparison with opposite side ⁽¹⁾

- Mild:** when the excess limb volume is less than 20%.
Moderate: when the excess is between 20 and 40%.
Severe: when the excess is more than 40%.

The classification will also take into account the following factors:

The skin may be swollen (Stemmer +) (*),
State of subcutaneous tissue: pitting or non pitting,
Cellulitis aspect of the skin, presence of erysipelas detected,

The classification should also take into account the physical and psychosocial impact of the oedema.

OEDEMA MEASUREMENT

Basic principles:

- **Oedema serves as its own control and is assessed** to determine its progression in the course of the treatment. The greatest diminution of volume is assessed during the intensive treatment (p. 7). The largest limb volume recorded is usually at the beginning of treatment. The skin is marked during the treatment period. In fact:
 - The localisation of the oedema is often not homogeneous.

(*) The Stemmer sign is (+) when the skin cannot be pinched normally and lifted up. This is due to a progressive skin oedema transforming it into a tissue.

- The marks remain present day after day: At this stage, treatment occurs daily and the patient wears a bandage.

- Due to this the circumference measurement is reliable.

- *The affected arm is compared to the healthy one but:*
The dominant arm is normally stronger than the non dominant.
The dominant arm may measure up to 2 cm or 8 to 9% larger in normal circumstances.
An oedema is confirmed when the arm is more than 10% larger than the healthy side.
- *Both arms are affected:* in this case both arms are compared to one another during treatment and reduction or increase in volume is monitored.

Measurements:

The patient is sitting down, the arm should be positioned horizontally with the hand is resting on the palm. If axillary web-syndrome prevents this position, the measurement can be taken with the arm placed at the side of the body.

The arm is marked by using a dermatographic pencil at various points.

If the oedema is partially located (forearm or arm) a few marks will be placed at a distance of 4 to 5 cm intervals. If the oedema covers most of the limb a mark will be placed at 10 cm intervals.

This distribution of marks is random since the circumference measurement will be compared to one another.

The rehabilitation of the patient is divided as follows:

- Inpatient treatment,
- Outpatient treatment,
- long-term treatment,
- treatment during radiotherapy or chemotherapy,
- treatment after breast reconstruction.

The different phases of treatment extend from the circumstances we have encountered in Continental Europe. Our situation cannot be compared to the ones of other countries where the length of hospitalization for surgery of breast cancer can last one day only. The treatments we describe cannot be applied to other countries outside Europe.

Rehabilitation during hospitalization

a. treatment when there is no oedema depending of the surgical approach ^(13, 14).

Re-education of the shoulder mobility is ongoing ⁽¹⁵⁾.

When 'radical' surgery has occurred:

Day 0: active mobilization of the scapulo-thoracic joint, of the elbow and the hand.

Day 1 to 3: Shoulder flexion in addition to abduction and general movements of the shoulder.

At the end of the hospital stay: general tests which consists of, facing the wall, move the two hands along the wall to estimate the general mobility of the shoulder movement.

Notice: a gentle massage of the shoulder is advised before any mobilisation.

The preventive measures and care of the limb are gradually introduced.

Manual lymphatic drainage is already recommend if the patient feels a sensation of swelling in his fingers.

b. treatment with existing oedema

The oedema may appear during hospitalisation but, at this stage, it is still minimal⁽⁷⁾. Treatment is identical to above but the physiotherapist also carries out daily manual lymphatic drainage.

Note: during hospitalization, excess mobilisation may induce "lymph" which in itself can induce a 'lymphocele' or seroma.

Post hospitalization outpatient

Oedema is the major disability that can greatly affect the quality of life of the patient.

We draw particular attention to its prevention in addition to its treatment without forgetting the other aspects of rehabilitation.

Upper limb oedema, post breast cancer surgery generally appears during the first year⁽⁷⁾.

Commonly recognised situations are:

a. Oedema not present;

Treatment is not necessary but preventive measures must be recognized by the patient.

b. Slight oedema: Size of the oedema is less than 20% compared to the healthy side.

Manual Lymphatic Drainage is recommended 3 to 5 times per week for 2 to 3 weeks, followed by reducing sessions until the end of the treatment.

c. The oedema is moderate or severe: the size of the oedema is more than 20% compared to the healthy limb. The oedema will be treated according to the International Society of Lymphology consensus document⁽¹⁾.

First stage: intensive care

Manual lymphatic drainage (MLD)

Low pressure intermittent pneumatic compression therapy (IPC).

Multilayer bandages.

Treatment frequency: 5 times per week for 2 to 3 weeks⁽¹⁶⁾

Duration: 1/2 hour for MLD

1 hour for Low pressure IPC

Application of multilayer bandaging

Note: IPC should be used with a pressure of 20 to 40 mmHg. Multilayered bandages are worn day and night. The patient remains active and proceeds with her normal activities of daily living. Sport activities are not advisable at this stage.

Second stage of treatment

Manual lymphatic drainage (MLD)

Low pressure intermittent pneumatic compression therapy

Compression hosiery

Treatment frequency: 5, 3 and eventually weekly

Duration: 1/2 hour manual lymphatic drainage
1 hour for IPC

Treatment is initially commenced daily for 2-3 weeks and depending on clinical results the frequency is progressively reduced to eventually once per week.

Some patients will require long term ongoing weekly MLD others will not.

The total duration of treatment depends of the severity of the oedema and its stabilisation^(16,17).

Initially, compression garments should be worn 24 hours per day.

Once maintained this can be reduced to daytime only and depending on progress and maintenance, the therapist may be able to reduce the wear of the compression garment altogether.

Long term treatment

Some resistant, chronic oedemas will require long term regular treatment.

This treatment requires regular manual lymphatic drainage, usually weekly.

The therapist will instruct the patient on appropriate physical activities and exercise in order to improve her quality of life^(18, 19, 20, 21, 22, 23, 24). Some sport activities are not recommended if surgery has taken place to the dominant limb⁽²⁵⁾. We have seen some lymphatic disorders by ladies playing volley-ball.

Wearing compression hosiery is helpful and often essential⁽²⁶⁾ according to the etiology of the oedema. If venous sufficiency is compromised it is essential to wear compression garments. However if only lymphatic insufficiency is present the patient can gradually reduce the wear of the compression and eventually stop.

It is recommended that all patients should wear compression garments for long journeys by car or train or when flying.

Rehabilitation during radiotherapy or chemotherapy

During Chemotherapy and/or radiotherapy the physical treatment of oedema does not differ from that described above. However the side effects of the treatment such as tiredness, nausea and psychological state should be considered by the therapist when selecting treatment^(18, 19, 20, 21).

Group exercises are advisable for several weeks: the exercises avoid expected tissue adherence caused by radiotherapy which can reduce joint range of movement. Exercises should specifically include:

The cervical region and scapulo-thoracic movement

Breathing exercises

Relaxation

Stretching of the nervous system according to Butler (27)

The therapist manages the grip strength by means of a dynamometer.

If the strength is reducing neuro-muscular facilitation techniques are required to prevent brachial neuritis.

Adapted favourable physical activities assist by improving the quality of life but their intensity must remain moderate; the activities must remain enjoyable with a low intensity⁽¹⁹⁾. They should be carried out 2 or 3 times per week for 30 minutes.

The radio-dermatitis produces a burning sensation which can be reduced by the application of appropriate lotion or cream prescribed by the radiotherapist.

A Reflex Sympathetic Dystrophy (RSD) may develop.

Accurate diagnosis including staging is essential to prescribe appropriate medical and physical treatments.

Treatment of adjacent problems

Breast oedema

The inflammatory process to the tissues of the operated breast can be extremely painful. Treatment will consist of: During the acute phase:

- apply cold wrappings
- perform lymphatic drainage manoeuvres to the supra-clavicular and bilateral axillary regions moving closer to the inflamed area. It is noticeable that the pain reduces following initial treatment. The use of multilayered bandages and compressive bra may only be applied at the end of the acute inflammatory process.

Drainage to the scarline will commence at the end of the treatment, when the breast will be reducing to a more normal size.

Deep breathing and pectoral exercises may be useful to achieve an indirect mobilization of the breast.

Axillary web syndrome

Sclerosis of the lymphatic vessels causes axillary subcutaneous web syndrome which limits the normal movement of the shoulder. The axillary cords start from the axillary fold to the elbow and sometimes reach the wrist. They are painful when extended, when the patient stretches her arm. The axillary cords appear normal in the first three months following surgery. They often disappear spontaneously but lymphatic drainage may achieve faster results⁽¹²⁾.

The patient must avoid brisk uncontrolled movements of the arm and must not attempt to force the range of movement. Members of the medical team must also avoid the use of aggressive treatment techniques.

Oedema of the lower axillary region

The patient may feel an oedema located in the lower axillary region which produces an altered sensation when the arm is swung whilst walking.

A physical examination can reveal the origin of this swelling: the therapist, located behind the patient, slightly pinches the skin bilaterally at the level of the swelling and notes the reaction of the patient.

Frequently, the pinching sensation is different which may arise from a superficial nervous problem inducing a local paresthesia.

The tissue atrophy exacerbated by the horizontal bra fastening may make one assume that there is a local oedema which produces a discomfort when balancing the arm. The sensation can normalise with regeneration of the nerves which may take up to 2 years.

The scar and the scar oedema

Scarline oedema is often located at its upper quarter.

The scar permeability progressively improves with venous vascularisation regeneration. This can take from a few days or up to two weeks⁽¹¹⁾.

The lymphatic regeneration process takes much longer. The macro-molecules are not able to cross the scar for several weeks.

The fluid portion of the oedema may be drained across the scar but the larger macromolecules must be drained via the collateral network⁽²⁸⁾.

The collateral route should be directed towards the contralateral lymph nodes.

The patient should lie in a laterodorsal position and the drainage procedure is carried out from the contralateral axilla and supraclavicular regions.

It is advisable for the patient to lie on the non operated side.

Treatment of the scar without oedema^(29, 30)

The physical treatment of the scar consists of:

Manual lymphatic drainage and gentle massage techniques to control the scar,

The prevention of eventual retraction is achieved through light stretching,

LMD is used for the first 3 weeks to eliminate metabolic waste.

The mobilisation of the scar is at first addressed cautiously: gentle massaging and multi-direction from the 20th up to the 45th day. The soft and progressive pinch-roll massage of Wetterwald can be replaced by the LPG® technique.

From the 45th day the same techniques may be applied with more energy.

Stretching massage can begin from the 45th day.

Permanent compression

Compression garments are worn to the affected limb to 'maintain' the results of physical therapy and are considered as long term management.

Several strengths of garments are available and are graded according to their resting pressure.

The pressure classification differs from one country to another.

Presently, standardised classification in European countries are suggested as:

Class 1 pressure of	15 to 21 mm Hg
Class 2 pressure of	23 to 32 mm Hg
Class 3 pressure of	34 to 46 mm Hg
Class 4 pressure higher than	49 mm Hg

Class 2 or 3 compression is usually required.

Class 4 compression can be used but can be extremely difficult for the patient to tolerate however, it may be necessary. Double layering of two garments can produce similar pressure effects a 1 strong garment. E.g. 2 class 2 garments are approximately equivalent to a class 4 garment. This can be a good alternative.

The compression garment must always be worn following intensive treatment (cf p. 6,7).

Rehabilitation post breast reconstruction

Breast reconstruction may be carried out at the time of surgery or later.

If radio or chemotherapy is necessary it will take place at a later date.

Most frequent reconstruction

Simple prosthesis.

Prosthesis with strips of musculo-cutaneous flesh from the latissimus dorsi.

TRAM containing strips of musculo cutaneous flesh from the rectus abdominis.

DIEP Deep Inferior Epigastric Perforate flap.

SIEP Superficial Inferior Epigastric Perforator flap.

IGAP Inferior Gluteal Artery Perforator flap.

SGAP Superior Gluteal Artery Perforator flap.

The physiotherapy treatment covers 3 stages

1. in-patient stay (3 to 4 days)
scapulo-thoracic and cervical mobilisations combined with respiratory exercise.
2. outpatient (up to 2 weeks)
shoulder mobilisation up to 90°
3. Ongoing treatment: progressive increase of the degree of mobilisation without inducing pain.
Scapulo-thoracic, cervical mobilisations and respiratory exercises to mobilize the thorax.

In case of expansive prosthesis, mobilization of the shoulder can also indirectly mobilize the prosthesis.

Follow by gentle multi-direction mobilisation of the prosthesis.

A gentle exercise regime can be taught to the patient by insisting on the softness of the mobilisation.

In case of prosthesis with muscle strips, mobilisation of the scapulo-thoracic and gleno-humeral joints restricted to 90° for the first 6 weeks due to the incision of the pectoralis major.

General mobilisation of the spinal column particularly focused on the thoracic region.

Gentle mobilisation of the scars and excision sites.

In the case of TRAM, abdominal respiratory exercises will be carried out in supine. The stripping of the rectus abdominis may cause an imbalance of the pelvis: the corrective postural exercises must be practiced carefully. The progressive strengthening of the abdominal muscle can commence after 6 weeks.

A compressive dressing will be worn each day for half a day to avoid hypertrophy of the scar.

Contra indications of the physical treatment

Erysipelas, lymphatic system infection and lymphangitis, inflammation of the lymphatic system are medical emergencies: all physical treatment must be suspended during the medical treatment of these pathologies which contribute to the slow degeneration of the local-regional lymphatic system.

Severe renal and heart failure is contra indicated to the use of multilayer bandages and IPC.

Thyroid problems and untreated tumour problems are also contra indications of physical treatment.

If swelling occurs a long time after initial breast surgery, medical examination should be sought. Any physical treatment will be stopped if the arm develops an inflammation during treatment.

Prevention of the oedema

Prevention advice is important for patients who do have an oedema but also those who already have it.

The following must be avoided on the operated side:

- Prevention of insect bites and stings, avoidance of injection, vaccines, acupuncture and blood tests
- Avoidance of tourniquet caused from blood pressure cuff, tight clothes and under clothes (select bras with wide straps), wear a watch to the other side
- Avoid carrying heavy weights such as buckets of water and heavy shopping bags. Carry a handbag on the opposite side
- Heavy work: long ironing sessions, cleaning windows
- Solar erythemas ('sun burn'); extremes of temperature such as very hot baths, frost bites, sauna or Turkish baths
- Thermotherapy
- Treat all cuts or scratches with an anti bacterial alcohol lotion
- Avoid burns when removing dishes from the oven
- Use hair removal cream not razors for removal of axillary hair.

It is advisable:

To wear gloves while washing the dishes.

To wear a thimble when sewing.

Wear jewellery on the other arm or on the other hand.

Avoid sports which can provoke hard shocks on that arm.

Apply moisturising cream daily. Use a hypo-allergenic cream or ointment (see the chemist).

Observe for dental infections.

Maintain a healthy body weight.

All preventative measures should be discussed and adhered to ensure a controlled but enjoyable lifestyle.

Patients should be informed of breast cancer support groups. Patient support groups hold regular friendly meetings where it is possible to discuss problems and feelings with other people in similar circumstances. The groups also organise information days where consultants for treatment and care are present.

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