

Case Study

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5 October 2011

LYMPHOEDEMA CASE STUDY

Written consent was obtained from my client, S, to present the following, including photographs, as a case study. Written referral was received from the physiotherapy department at a general hospital with diagnosis of **Lymphoedema of Left Arm**. S brought correspondence from several specialists to the first appointment.

At this time I had not completed Lymphoedema training. There was no lymphoedema service in the local health district. I had previously worked under direction as the team member performing lymphatic drainage for a complex case, and for several referred clients requiring ongoing maintenance of their lymphoedema. When S was referred to me by the physiotherapist, they were both fully aware of the status of my training. I sought advice and direction from an experienced lymphoedema therapist.

1 - SUBJECTIVE - initial assessment

S is 58 years old and lives with her semi-retired partner and semi-independent son who is a university student

Medical and surgical history

2007 Total abdominal hysterectomy and bilateral salpo-oophrectomy for cancer. Cut into bladder and nerve damage to lumbo-sacral plexus causing bladder pain and dysfunction. Assessed by neurologists and pain service for pain management. Radiotherapy pelvis.

2004 Incomplete removal of cerebral meningioma, and 3 metal plates and screws in situ. Residual fragment of tumour inoperable and presses on the optic nerve which has resulted in blindness in L eye. Radiotherapy.

2002 Fell and fractured proximal end of L radius and ulna, and L scaphoid.

2002 Breast cancer - L partial mastectomy with total axillary node clearance. Radiotherapy. Wears prosthesis. Plans to have breast reconstructive surgery. Healed well with no infection, axillary web syndrome or seroma.

1990 Cervical cancer. Cone biopsy.

1986 Caesarian birth

Medications: Simivastin for hyperlipidemia
Oxytrol patches for bladder control
Blood thinner for arteries in brain
Paradex as analgesic
Calciferol monthly

Lymphoedema History

No family history of oedema or lymphoedema. S is right handed.

After breast surgery in 2002, the wounds healed without incident. Secondary lymphoedema developed gradually during the 12 months post surgery. Five months post surgery, she fell and fractured the proximal heads of L ulna and radius, and L scaphoid which caused bruising and swelling of the forearm. S had first noticed swelling in the L upper arm, and it now affects the full arm, hand and fingers and over scapula. S describes her awareness as a

heavy ache in L arm, and numbness or soreness in L wrist and L elbow at the sites of previous fractures. Her abdomen feels swollen.

Subsequent surgeries have resulted in intermittent increases described as "bloating" in arms and abdomen. S feels that each surgery has made the swelling of her arm worse. Occasionally her arm feels sticky and wet and oozes fluid. S has not experienced any skin infections.

Air travel has affected her adversely with L arm swelling noticeably. Her ankles and lower legs have not swollen with the wearing of Class I compression knee highs (not graduated).

When localised pain in L pelvis or L shoulder is severe, she feels that the swelling worsens, and her weight can vary 2-4 kgs from day to day. Lymphatic drainage, elevation of the limb, and swimming (in the sea) have reduced the swelling and eased the discomfort in the past.

Lymphoedema of the L arm was previously assessed and diagnosed at a District Health Board. Treatment consisted of occasional sessions of MLD, and a Class 2 compression sleeve and gauntlet, or kinesio tape. S was aware of self drainage although did not perform this regularly. Verbally, she received advice re skin care and exercise for the shoulder.

Some previous activities are limited - computers, work, housework, vacuuming, ironing, driving distances - due to lymphoedema and pain restricting range of movement and increasing fatigue. S relies on others to complete some chores. Occasionally requires walking stick for balance on stairs.

Although S also experiences puffiness in the face and scalp, she requested that I do not touch this area.

Social

Always on the go! Exhaustive list of commitments to self and others.

Until her diagnosis of breast cancer, S owned and managed a chain of hairdressing salons. She continues to cut, shampoo and blow wave for 4-6 clients weekly in her kitchen. As an accomplished cook she hosts dinner parties regularly, and loves to dance. There is a wide circle of friends including several with high standing in the community and attends business and social events regularly. S supports her many friends through grieving and dying, and regularly attends funerals. She is invited to speak of her experiences with cancer at cancer society meetings. An artist, she sells her paintings, and travels overseas 3-4 times per year to Europe and the Pacific to lie in the sun in her bikini.

Psychological

S exhibits an extremely positive and outgoing personality. She laughs a lot and relates amusing stories about her life experiences. S dresses immaculately in bright colours with attention to details - makeup, nails, hair, 3 inch heels, and expresses frustration that lymphoedema affects her ability to wear some jackets and blouses.

S has a feisty nature and is a fighter - she has unsuccessfully challenged (NZ) Accident Compensation Corporation to pay for medical misadventure in relation to pain due to nerve damage during pelvic surgery. States that anger at "bureaucracy and idiots" gives her strength. A neurologist writes that "she never backs away from expressing her own views, perhaps with little regard for possible consequences."

There is ongoing concern re her unwell mother. S does her weekly shopping. She is also frustrated at being unable to work regular hours due to medical appointments (up to 14 per month), and has financial concerns for future treatment. Her disability benefit is reviewed 3

monthly which adds stress.

Client Goals

Short term - reduce swelling, lessen pain when using L arm

Long term - maintenance, function without pain, self management

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The initial subjective assessment . What other information would have been useful?

Establishing the **24 hour patterns** of swelling and pain would have been useful. The swelling of S's arm which decreases with rest, eg overnight, and when the arm elevated, is indicative of lymphodema. Assessment of pain over 24 hours indicates the relationship of an increase or decrease related to various activities or rest. Modification or avoidance of particular activities that exacerbate discomfort and pain.

Quality of life assessment

Lymph oedema can cause physical symptoms, impaired physical and social functional and emotional effects. The QOL assessment measures the impact of chronic oedema on the individual and demonstrates the changes as a result of treatment. The QOL can be used as a practical tool to influence treatment decisions and outcomes, and ultimately research studies to assess effectiveness and cost effectiveness of interventions.

Lymph oedema and chronic oedema specific QOL tools have recently been developed using separate tools for arm and leg lymph oedema. The questions are in the 4 domains of symptoms, body image and appearance, function and mood. My initial subjective assessment form does include several general questions to gather information on these issues. I intend to review the questions for more specificity. S lives her life to the full.

I feel that my initial subjective assessment is comprehensive in relation to the issues that are relevant to S.

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2 - OBJECTIVE - initial assessment

Height 153cm
Weight 57kg
BMI 24.3

Visual and with photographs (included)

Body shape - small stature but relatively heavy below waist, and in buttocks and thighs. Slim lower legs and ankles.

Congestion - L arm, L posterior shoulder and upper back. Not wearing compression sleeve.

Scars - inferior to L breast to L axilla - slightly raised but tidy scar
Caesarian - transverse lower abdomen - appears soft

Skin - appears tanned - in tact - no evidence of infection - no nodules - multiple freckles and small moles of differing sizes and density of colour. Fine veins visible on thighs.

Skin folds - tight bra with tissue bulging laterally. Creases at posterior shoulders.

Palpation

Temperature - skin dry, slightly cool to touch in all areas except skin warm in axillae.

Texture - tanned skin has slightly leathery texture with fine wrinkles where there is no subcutaneous congestion.

Fibrosis in radiation affected area lateral breast, and shoulder where congested, forearm, wrist, along ulna, ante-cubital fossa. Mild pitting medial and posterior L arm.

Scars - mild tension in breast scar which limits full range of motion of shoulder. Abdominal scar soft and flexible.

Stemmer's sign negative hands and feet.

Posture

Forward head posture
Thoracic kyphosis
Leans to R with lateral spinal curvature
L shoulder elevation and abduction
L shoulder protracted
Forearms medial rotation with elbow flexion
Lateral rotation legs. Bilateral bunions

Range of movement

Shoulder:

- **flexion** greater than 100° - feels pain with restriction in axilla and along scar, and over scapula

- **extension** - unrestricted - able to do up bra comfortably

- **medial rotation** unrestricted

- **lateral rotation** - mild restriction at end of range possibly due to congestion over teres muscles and infraspinatus.

- **full rotation** restricted by pain posteriorly and superiorly to shoulder joint.

Pelvis - anterior rotation: greater on R

Hips:

- **flexion** and **abduction** reduced as caused pain in lower abdomen.

Hand grip - initially, minimal difference in strength with L slightly less, but unable to maintain the grip on L due to discomfort in L forearm adjacent to ante cubital fossa. R hand dominant.

Standing to sitting / sitting to standing

- used edge of desk for support as sharp pain in buttocks and L anterior pelvis into L thigh.

Gait - walks confidently in heels with legs in moderate lateral rotation. Cautious in bare feet due to discomfort from bunions and callouses.

Breathing - disorganised and upper chest breather.

Able to pull on sleeve with minimal discomfort.

Measurements - limb circumferences in centimetres - with tape measure

Upper limb	L	R
Hand	19	18.5
Start - 2cm above ulnar stylyus	16	15.25
10cm	23.5	21
20cm	28	24.25
30cm	32.25	29

Hand measurement was circumference taken at level of meta-phalangeal joints.

Lower limb	L	R
Foot	21.25	21.5
Above ankles	22	21.25
Calf- 10cm below patella	36	35.5
Thigh - 10cm above patella	57.5	57

Objective measurements are not comprehensive. Since completing lymphoedema training, I now measure at 4cm intervals.

A selection of photographs was taken - the first show the tension of tight bra. Again, my approach has evolved and is more consistent and with minimal clothing if the client is

comfortable and consents to this.

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Severity of Lymph oedema.

The L arm lymph oedema meets the criteria for a chronic moderate to severe ISL stage 2 lymph oedema. The arm has a distorted shape at the medial elbow, the swelling does not completely resolve with a compression sleeve, or with elevation. Occasionally the hand fingers are puffy, but this is soft, and does resolve with gauntlet and elevation. Stemmer's sign is negative. S has a history of lymphorrhea, but generally the skin is in good condition and intact.

There are localised areas of mildly pitting fibrosis, but other areas have only a slight textural change. The posterior L shoulder is oedematous and fibrotic.

Ultimately the treatment plan will be determined by the site, stage, severity, and complexity of the lymph oedema. The response to treatment is affected by coexisting medical, functional or psychosocial problems, and the patient actively involved.

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What other factors could be measured and what tools could be used?

Bio-impedance Spectrography (BIS)

BIS analyses and measures the opposition or resistance (impedance) of body tissues. An imperceptible electrical current is passed through these tissues to determine the amount of extracellular fluid. As the amount of fluid increases, the signal passes more easily through the tissues.

Bio-impedance is developing as a viable tool to aid in assessment as it provides sensitive (can measure 2% change in volume in arm) non-invasive assessment that reacts to treatment modalities and environmental effects that act to reduce or increase lymph oedema.

Uses include prediction and early intervention at Stage 0 when lymph oedema is subclinical and not visible to the naked eye. This subclinical state may exist for months or years before lymph oedema occurs, but early intervention enables easier management.

Contraindications include the presence of metallic stents and joints. S has metal plates in her skull after her brain surgery. However this would be outside the area of bio-impedance measurement.

Base line pre-operative assessment taken on both arms for comparison (noting the increased muscle mass of dominant arm and therefore asymmetry) and then compared to serial readings at 3 monthly intervals for 2 years, may have been useful in predicting S's potential to develop Lymph oedema.

However, when S fell at 6 months post surgery, the fractured ulna and radius and associated swelling exacerbated the lymph oedema.

Bio-impedance ratios (L-Dex = lymph oedema index) are not a definitive diagnostic criterion but are useful alongside clinical judgement and careful examination of breast cancer related, unilateral lymph oedema. Standardised protocols for use are still being formulated.

Relatively cheap and easy to use. Less effective as lymphoedma advances and greater fatty content of tissues.

Perometry

Opto-electric measuring device measures limb volume
Not available in New Zealand.

Doppler

To exclude peripheral arterial occlusive disease prior to compressive treatment.

Lymphangiogram

Visualise lymphatic vessels through direct cannulation of these vessels through a skin incision. Technically demanding, painful and time consuming with increased risk of hypersensitivity reactions, emboli, infection, local inflammation and fibrosis. Procedure is becoming outdated.

Lymphoscintogram

Measures functional status of lymphatic system, including lymph movement, lymphatic drainage, and response to treatment.

The main clinical applications:

- differential diagnosis of extremity oedema of uncertain origin

- assessment of results of interventions eg micro-surgery, liposuction
- prediction of outcome of lymph oedema therapy
- assessment of risk of developing lymph oedema

Lymphoscintigram alone can exclude lymph oedema as a cause of limb swelling in 33% cases.

Lymphoscintigram will also differentiate between lymphoedema and oedema of venous origin.

In patients with **venous** leg ulcers, lymphoscintigram reveals significantly reduced lymph drainage in affected and non-affected ulcerated leg, and also with varicose veins especially if deep vein incompetence is present. Suggests that chronic venous insufficiency is also associated with lymphatic insufficiency.

In **post-thrombotic** disease, there is a reduction in subfascial lymphatic flow whereas epifascial flow remains normal. In lymphoedema both are abnormal. Both compartments must be evaluated to differentiate between post-thrombotic disease and lymphoedema.

Lipoedema - LS will confirm that peripheral lymphatics are essentially normal although flow may be slower. The picture is often asymmetrical although the disease is bilateral.

Primary lymphoedema

- demonstrates level of obstruction and severity of abnormality
- identification of involvement of clinically affected limbs
- planning of therapy eg MLD by identifying presence and course of collaterals.

Ultrasound

Shows volumetric changes ie alterations in thickness of dermis, increase in subcutaneous layer, and an increase, decrease or no change in muscle mass. Also structural changes ie hyper- or hypo- echogenic subcutaneous layer. Allows assessment of soft tissue changes but gives no information about truncal anatomy of lymphatics.

Computed Tomography (CT) and Magnetic Resonance Imaging (MRI)

Identify the presence of tissue changes related to lymph stasis. Clinically a limb may be swollen but it is difficult to dissociate fat from simple oedema or fibrosis. Confirmation of diagnosis and monitor the effect of treatment. CT can show tissue abnormalities in (changes and fat deposition) when treatment not effective.

The results of CT and MRI alter treatment

a) CT findings:

Lymph oedema - shows thickening of the subcutaneous compartment, increased fat density and thickened per-muscular aponeurosis. Typical honeycombe appearance.

Chronic venous disease - enlargement of subcutaneous compartment. And skin thickening but no honeycomb appearance.

Lipoedema - enlargement of subcutaneous compartment, normal skin thickness, and normal sub-fascial compartment.

Deep vein thrombosis - increase in subcutaneous layer. Increase in cross sectional muscle area and enlarged superficial veins. Can be unreliable if no increase in muscle.

b) MRI findings

Differentiates lymph oedema, lipoedema, and phleboedema (symptom of chronic venous insufficiency).

Lymphoedema features include circumferential oedema, increased volume of subcutaneous tissue, and a honeycomb pattern above the fascia between the muscle and subcutis, with marked thickening of the dermis.

Difficult to differentiate between primary and secondary lymph oedema, but does show angiosarcoma.

Lipoedema features include normal peripheral lymphatics, the soft tissue consists solely of fat, and subcutaneous oedema is absent.

Deep vein thrombosis features oedema of muscles.

Predictions of undiscovered bio-markers or genetic poly-morphisms.

Water Displacement Method

Water displacement is an expensive way to measure the volume of abnormally shaped arms or legs. Comparison with unaffected limb. Includes hands and feet. S has history of lymphorrhea so risk of infection.

Full objective and measured physical assessment including function and exercise ability and tolerance

S had several assessments of her physical abilities in relation to range of movement of her shoulders and hips (including mine), but the information was often disassociated with how she was feeling at the time. There were often delays before professional appointments, and the original referral did not relate to where the pain or dysfunction was on the day of assessment. If S thought that any instructions given were irrelevant, her interest in complying to the exercises given waned. Although S is always active, she does not perform specific exercises and stretches.

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3 - SUMMARISE MAIN PROBLEMS

Medical and Surgical History

Extensive surgery for brain, breast and uterine cancer has compromised S's health on several levels including the development of Lymphoedema of L arm and pelvis. Difficult to ascertain cause and effect in relation to oedema and pain. When chronic pain is exacerbated, the oedema appears to increase. However, the pain could be from several causes (lymphoedema, previous fractures forearm, damaged nerves, underlying muscles, and emotional, mental, and physical stress). Quandary as to how to structure each session to give S relief, but also make gains with lymphoedema.

Lymphoedema L arm

Stage 2, with areas of fibrosis, secondary as outcome of axillary node clearance. Extended area of congestion L posterior thoracic.

Lymphoedema pelvis, secondary to pelvic surgery for cervical cancer.

Potential for lymph oedema of legs to develop

Fractured proximal heads of L ulna and radius, and L scaphoid 5 months after surgery. Is this a significant contributor to the ache S feels in her L arm and shoulder? Did the fall and fractures compound the risk of lymphoedema developing within 12 months of surgery? And have those tissues damaged at that time become fibrotic and resistant to long term effects of MLD and compression? Has the impact also created tension the pelvis which has been exacerbated by later surgical events? Treatment plan includes redirection of lymph away from congested areas.

Lymphorrhoea

Infrequent but risk of infection. I wash hands and wear vinyl (not latex) surgical gloves if skin moist. Caution with application of Kinesio tape.

Lymphorrhoea mostly occurs in palliative care, but is also a complication of concurrent leg ulcers. S's lymphorrhoea occurs where the skin adjacent (proximal and distal) to the area of the L elbow is at stretch capacity and lymph fluid leaks through the skin. In this area, excess extra-cellular fluid cannot drain into the overloaded lymphatic system, the anchoring filaments are over stretched or damaged, and the spaces between epidermal cells are widened and fluid leaks.

S's leakage is moderate, but occurs only intermittently, with extended dry periods of 2-3 months. For S this is the area of least fibrosis where some mild to moderate pitting is always evident. Lymphorrhoea may also occur as a result of trauma to the skin, and S has regular oncology checks to identify the presence of recurring or growing tumours. There are no visible lymphoceles.

I have learnt that pelvic lymphoceles are a complication in 20% of patients after surgery for cervical carcinoma with radical hysterectomy with removal of para-aortic nodes and pelvic vessels and nodes. In 2007 S underwent a total abdominal hysterectomy and bilateral salpingo-oophorectomy followed by radiotherapy to the pelvis. Her patient notes do not detail the extent of lymphatic clearance. She states that she does not feel swollen in the genital area and, objectively, her legs are not oedematous.

Pain

S describes pain differently depending on the area. "Nerve" pain in L pelvis and anterior thigh, and "sharp" pain L buttock. Intermittent L arm "aches - more diffuse - not area specific - numbness" - at rest and with activity. "Soreness" over sites of previous fractures at proximal heads of radius and ulna. Pain L scapula limits flexion and abduction shoulder - also swelling is worse when chronic pain is generalised. S considers pain as the focus for treatment, not the oedema.

Assessed by pain clinic but discontinued prescribed medications as she felt better able to cope with pain than the side effects of medication.

The causes of pain are multi-factorial and this is evident in the way that S describes her pain from the 'ache' of lympho oedema, the 'soreness' of previous myofascial injury adjacent to fractures, and the 'sharpness' of nerve pain. S feels that a combination of any or all of these different pains contributes to worsening of swelling. Or, is pain worse when swelling is worse? When superficial areas are oedematous, the underlying tissues including muscle also feel congested. Accumulation of products of inflammation irritating nerve endings. Adhesions and scar tissue from previous surgeries, radiotherapy, and injuries.

Lymph oedema increases pressure in subcutaneous tissues causing 'heavy ache.'
If compression sleeve not worn then lack of support for swollen tissues.

Sympathetic nervous system constantly active with sustained muscle contraction resulting in retention of lactic acid, chronic inflammation, and postural compensations. Which of these pains increase or decrease with activity, rest or change of position?

Upper chest breathing and hyper-ventilation - carbon dioxide retention is a factor of acidosis which also increases muscular pain. Emotional stress and sleep disturbance contribute to fatigue which reduces tolerance to pain.

The symptoms of lymph oedema cannot be viewed in isolation, when S perceives and describes different pains from different causes.

Postural compensations

S has a noticeable lean to the right to support the weight of the L arm and reduce drag on the L shoulder. This has resulted in a noticeable curvature of the spine. There is asymmetrical anterior pelvic tilt which may be result of pelvic pain. Shoes with high heels alter weight bearing load of lower leg muscles with generalised effects. She walks with lateral rotation of the legs as her feet have painful bunions.

Any of these postural changes may contribute to poor sleep, fatigue and perpetuation of generalised pain.

To support heavy L arm, S exhibits a lean to R with stretch / contraction of antagonistic muscles increasing tension along R lower thoracic R lumbar erector, R QL and stretching contra-laterally. Performing daily activities in this compensated position adds to stress along the whole spine, pelvis and shoulders.

Spinal nerve and L thoracic outlet compression result. Myofascial trigger points in contracted muscle and tendons refer pain (for S, to the buttock, psoas; anterior thigh, and from L infraspinatus to L elbow and forearm).

Under direction, S performs deep breathing exercises, but this postural asymmetry with the thorax involved means that she is unable to easily maintain a regular deep breathing regime. Increased acidosis contributes to increased pain levels.

Psychosocial

Demands of fast paced lifestyle, and commitments to family and friends. Several diagnoses of cancer with awareness of growth within her skull. S has resistance to treatments that are time consuming, are cumbersome, or may restrict social activities. Inconsistent approach to plan varies from week to week and session to session - MLD plus compression sleeve or taping or focus on pelvic pain.

I may perceive S's attitude as an obstacle to best practice principles but feel that this attitude gives her inner strength to face her challenges, and maintain a perception of control in her life. I plan to give verbal and written information with explanations of potential benefits and risks of a given approach. Allow time to process information rather than to overload.

Emotional and psychological stress can have a profound effect on the physical state. Again, S has difficulty relaxing and enabling the PNS to dominate, which would reduce stress levels, promote sleep, and enhance lymphatic and digestive function.

S has expectations to be always in control of all facets of her life from family, socially, and in how she presents herself. Her perception appears to be that she doesn't have time to relax. Keeping physically and mentally occupied allows little time to dwell on her illness.

Further investigation into S's perception of coping and how develop strategies to promote balance in her life would be useful.

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4 -POTENTIAL DIFFERENTIAL DIAGNOSES?

S was referred with diagnosis of lymphoedema of L arm. Evaluation of subjective history and objective assessment support this diagnosis.

(At the time, I did not consider deep vein thrombosis of the L arm).

Frequent visits to oncology, neurology, ophthalmology, gynaecology specialists and general practitioner. Cardiac, renal, liver and thyroid function tests, blood pressure, within normal parameters. No evidence of recurrence or spread of breast and pelvic cancers. Residual meningioma growth slow since 2004. There is potential for recurrence of breast and/or pelvic cancers, or increased rate of growth of meningioma.

No history of deep vein thrombosis or ankle or lower leg swelling and pain despite regular air travel. On examination, S's legs are asymmetrical with small differences in circumferential measurements. The lower legs soft and non tender to palpate, no redness or difference in temperature. There is no oedema evident in the lower legs and ankles. S's legs are not indicative of venous insufficiency or dependency oedema. Doppler was not done. Stemmer's sign negative.

In consideration of possible lipoedema, the appearance is not typical. Although the upper thighs have a heavy appearance and are tender with moderate pressure, they are slightly asymmetrical and the lower legs and ankles are slim. There is the presence of spider veins over the thighs.

S does not take medications (calcium channel blockers, steroids, non-steroidal anti-inflammatories) that could cause oedema.

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Deep vein thrombosis of the arm was not considered at initial assessment.

Investigation to exclude DVT of the arm, or other venous or arterial compromise assessment would have included history of swelling (speed of onset). Superficial veins may be enlarged to compensate. Prolonged high pressure may lead to low level inflammation in surrounding tissues.

Urgent referral for further vascular investigation as potential for pulmonary embolus. Ultrasound and color flow Doppler are rapid, noninvasive means of diagnosis. Also Venography, MRI, and CT.

I first saw S in 2008. Her L partial mastectomy was performed in 2002. In 2007 her brain surgery required central venous lines. Blockage of the superior vena cava is one major risk factor for upper extremity DVT. The other factor is compression of neuro-vascular bundle at thoracic outlet due to myofascial tension.

Differential diagnosis between DVT and other oedemas due to venous or arterial incompetency (eg due to atherosclerosis) - assessment of pulses, finger oximetry, colour, cyanosis, temperature of skin, pattern of pain (ie worse with movement, or elevation, where felt) , pattern of swelling (ie worse with activity or rest, does it reduce overnight) signs of ischaemia. cramps, tingling. Longer term circulatory compromise may show

atrophy of muscle, fingernail changes, bilateral asymmetry, ulceration, permanent pigmentation due to haemosiderin which can occur after injury, and reduction or loss of function. Possible difference in blood pressure bilaterally - not advisable to apply blood pressure cuff if lymph oedema or DVT suspected!

In her lower legs, S has no swelling or pain other than that in feet due to bunions. However, there is potential for the legs to become oedematous due to the pelvic surgery and radiation therapy compromising distal lymphatic drainage through the pelvis. Fortunately, there appear to be well established alternative pathways bypassing the pelvis. I have encouraged S to be vigilant with skin care of her legs and feet also, and to seek advice if she notices pain, swelling, or her legs feel heavy. The muscle pump of the lower legs is not activated with the wearing of high heels.

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5 - WHAT WAS DIAGNOSIS AND HOW DID YOU COME TO THIS CONCLUSION?

I concurred with the previously made diagnosis of secondary Lymphoedema of the L arm. This diagnosis meets International Society of Lymphology criteria for stage 2 lymphoedema, with some fibrosis evident. Although S's hands swell at times, Stemmer's sign was negative.

Some areas feel fibrotic with mild pitting. Generally the skin of the remainder of the arm is flexible but has a mildly thickened texture. However, I feel that the overall diagnosis of stage 2 lymph oedema is correct, but there is potential for this lymph oedema to progress steadily to stage 3 if not managed and controlled.

Lymphoedema of the pelvic and abdominal areas is harder to define as the swelling varies significantly from day to day but dissipates readily with MLD. There is no evidence of superficial pitting.

On reflection, I still find it difficult to define the swelling in this area. The response to MLD is instant (after clearance of R axilla and main abdominal trunk). Is this a Stage 1 lymph oedema despite being chronic (present for longer than 6 months)? Client surgical history, it is mostly reversible, tissues are soft after MLD, and there is no pitting. Or is the oedema in part due to constant action of sympathetic nervous response (vaso-constriction)?

I considered a lipoedema component as S's body shape has possible saddlebags at lateral thighs but her lower legs and ankles are not typical of lipoedema. Visually and with palpation, her thighs and buttocks appear congested and are sensitive to moderate pressure but this could be a result of her nerve injury. MLD does not significantly alter these areas. There is underlying muscle tension, however.

Again I have considered if there is a component of lipoedema. The picture is not typical and some weight loss and specific exercises may tone the thighs which appear as saddle bags.

Evaluating S's medical and surgical history with axillary clearance, and several courses of radiotherapy in different areas of her body, the potential for lymphoedema as a result of lymphatic compromise is evident. The onset and progression of L arm swelling is indicative. Her subjective descriptions of heaviness, ache, and leaking are associated with lymphoedema of L arm.

Objective measurements indicate asymmetry with the L arm significantly larger despite R handedness. Palpation reveals localised areas of fibrosis along the ulnar surface of forearm, at ante cubital fossa, and medial elbow.

S's hospital clinic diagnosis of lymphoedema was not made with any objective measuring equipment such as bio-impedance. MRI and ultrasound had been performed, but not for the purpose of investigating issue changes in relation to lymphoedema. MLD had previously been performed under the direction of her oncologist.

Bio-impedance for Stage 2 lymph oedema would have limited diagnostic value as there is greater ratio of fatty tissue to fluid.

Other factors to consider:

A management plan for S will require modification in relation to her lifestyle demands and stress levels at any given time. Any proactive self care strategies will need to be easy to implement, time friendly and make sense to S - or she may not bother, or apply with haphazard approach.

The diagnosis of lymphoedema stage 2 could not be considered in isolation without taking into account all the other factors in her life that impact on her body.

For our relationship / partnership to be productive for both, I will explain clearly and ensure that S understands the benefits of various treatments, but keep an open mind to her personal choices. As S has a strong (and even intimidating) personality, I need to ensure that my practice is not compromised while meeting her goals.

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6 - WHAT TREATMENT OPTIONS WERE AVAILABLE FOR MANAGEMENT OF LYMPHOEDEMA?

MLD for scalp not attempted as requested by S. Also, I was unsure of status of growth of residual fragments of meningioma and do not treat over sites of potentially active tumours.

The **lymphatic system** is a one way drainage and transport system consisting of different vessel sections and interspersed lymph nodes.

The filtration and reabsorption processes from vascular to interstitial spaces are balanced by hydrostatic pressure in blood capillaries (semipermeable to fluids and solutes) and colloid osmotic pressure in capillaries and tissue fluids. Interstitial fluid not reabsorbed into the capillaries passes from unstructured channels into the initial lymphatic capillaries. Single layer of endothelial cells with opening controlled by anchoring filaments which stretch in response to the build up of fluid. Lymph is then transported into lymphangions which have vascular structure with valves and inherent innervation by parasympathetic nervous system (lymphangio-motricity). Rhythmic contractions by lymphangions creates a vacuum to aid in movement of lymph and the valves prevent back flow. The is 6-10 beats minute when the body is at rest.

This system transports proteins, other large molecules and water back to the vascular system. Lymphocytes and other defense cells are recirculated, and large molecular waste material, viruses and bacteria, and proteins are removed from body fluids through the action of macrophages.

Lymph oedema is a persistent ; stagnating, high protein oedema caused by mechanical insufficiency, or a pathological combination of chronic inflammation, Causes can be primary (fewer and/or poorly formed vessels) with oedema developing at different stages of life; or secondary (result of interruption of the vessels and nodes (surgery, injury, allergic reaction). Lymphoedema is exacerbated when the lymphatic system is challenged beyond its capacity.

Lymph oedema results as an accumulation of fluid and other elements (eg proteins) in the tissue spaces due to an imbalance between interstitial fluid production and transport (usually low output failure). Macrophages are unable to clean up waste products from the cells and the interstitial tissue becomes clogged with stagnant fluid and waste which the lymphatic system is unable to clear. Distance between cells and capillaries is extended and cells become nutrient depleted and ischaemic. The skin of the affected area stretches to accommodate the increased volume of extracellular fluid. Over time, connective tissue (collagen) proliferates and this tissue becomes fibrotic.

MLD for arm and pelvis. Explore alternative pathways already established - assess effectiveness. Open other pathways if viable.

Manual Lymphatic Drainage (MLD) decreases sympathetic(SNS) response and increases parasympathetic (PNS) of autonomic nervous system. When PNS is increased, MLD causes relaxation, antispastic and analgesic effects.

Light, rhythmic stimulation of the skin nociceptors may have a pain inhibiting effect (although nociceptors generate pain signals, non-noxious sensory stimulations can help diminish pain intensity). MLD stimulates smooth and striated muscle contractions, especially lymph and blood vessels aiding venous return and stimulating contraction of the precapillary sphinctre.

MLD helps to reroute stagnant protein rich fluid from superficial extracellular spaces to deeper vessels and on to healthy tissue with functioning lymphatic vessels and nodes (may be across watersheds to different lymphotomes) reducing inflammation and swelling. Removal of toxins promotes tissue regeneration and wound healing.

When lymph passes through lymph nodes, antibody / antigen contact is increased. Immune function is stimulated and provides humoral and cellular immunity.

Diminishing fight or flight response is helpful in dealing with stress, depression, poor sleep, and can reduce chronic pain. Aids in digestion of fats in particular and improved digestion in general.

MLD in conjunction with relaxed deep abdominal breathing enhances the effect of PNS and lymphatic drainage.

Compression - Class 2 sleeve (Jobst - ready made) and gauntlet. S refused to consider compression bandaging so this was not an option.

S wears a class 2 (20-30mm Hg) long arm sleeve with top band. Circular knit, ready made which, when worn regularly is effective at maintaining the arm. S wears a gauntlet occasionally. The sleeve does not appear to have an issue with rolling or slipping.

I believe that S would benefit from bandaging between MLD sessions to prevent fluid accumulation. To maintain lymphatic drainage, self drainage and gentle arm exercise programme, and including elevation of the arm.

Short stretch bandages provide low resting pressure and high working pressure. Resting pressure is the constant pressure applied externally by compression. Working pressure is the temporary pressure generated internally in the muscle. As the muscle contracts, tissue pressure is increased and compresses both lymph and blood vessels. Working pressure increases the efficiency of the muscle pump - vessels fill during muscle relaxation and are emptied by working pressure.

To maintain the pressure gradient compression decreases from distal to proximal. If a bandage is applied with even tension, greater pressure is exerted distally on the wrist, where the radius is smaller, than on the upper arm where the radius is larger (Laplace's Law).

S has previously been resistant to bandaging but I believe that she would benefit from a review of her treatment programme with a more intensive approach. Included would be a structured plan as follows:

Decongestive phase: Daily MLD and bandaging for 2- 4 weeks and reassess frequency required.

Transition stage: Maximise effects of decongestive phase by ensuring that fluctuations in swelling have stabilised and that rebound is avoided. Long term strategies are evaluated and self management encouraged.

Maintenance phase: MLD 1-3x week and wearing of Class 2 compression sleeve. Consider wearing of overnight compression to prevent / reduce re-accumulation. The Caresia bandage liner is easy to wear and over which S or her partner could apply short stretch bandaging. Attention to skin care, and include use of anti-fibrotic material (mobiderm) as tolerated at all stages to soften fibrosis and enhance drainage from fibrotic areas. As compression garment requires replacing, consult with garment representative to ensure garment is appropriate and measurements are correct. Choose right type and ensure the right pressure and gradient.

The abdominal and pelvic area drain so efficiently with MLD, and there is no oedema evident in the lower legs and ankles. However, I will keep in mind that at some point this area and the legs may need further evaluation in relation to compression.

New product **Coban 2** appears lighter, easier to apply and allows flexibility of movement. I have booked into a full day workshop to understand its potential application, and if appropriate I will offer Coban to S as an alternative to reduce lymphoedma and fibrosis.

Kinesio tape - caution with history of lymphorrhea - applied 1-2 weekly when arm dry.

Medical Tape

Medical tape (Kinesio, Cure Tape) is a thin, porous cotton fabric with non-allergenic adhesive, similar to weight and thickness of skin. It is flexible, stretches along a longitudinal axis, is air permeable and water resistant, and lasts 3-5 days. For lymphatic drainage the tape is applied at 10% stretch onto stretched skin to create convolutions.

Influences on lymphatic system:

Skin: when applied to areas of fibrosis and scar tissue, small convolutions in the tape increase the space between skin and muscle, lifting the skin, promoting blood and lymph flow and softening the tissues.

Muscle: Action of tape on sensory receptors in the skin can improve muscle contraction. Deeper lymphatic vessel function is enhanced by nearby pumping action of muscle contraction and relaxation.

Myofascial: Kinesio tape is thought to facilitate myofascial release by lifting skin away from muscle fascia, facilitating blood flow and increasing reabsorption of lymph.

Circulation: Convolutions of tape improve blood flow in and out as the space between skin and muscle is increased.

Neurological: Pressure from excess fluid on sensory receptors in the skin causes pain, numbness or reduced sensitivity. Removal of excess fluid by the action of kinesio tape leads to a reduction in pressure and improves the ability of receptors to communicate with the brain.

Respiratory: Thoracic pressure changes draw lymph from the extremities using a vacuum effect. Taping of the diaphragm can improve respiratory capacity by increasing expiratory volume.

Contra-indications include allergy - pre-test advisable - and stop use if skin reaction. Use with extreme care on irradiated skin as fragile and risk of skin damage.

Fibrosis - soft tissue techniques to gently break down fibrosis.

The accumulation of protein rich fluid in the interstitium followed by protein degradation causes a reaction similar to chronic inflammation. Increased vascularisation and vessel permeability, increased presence of macrophages, increased tissue regeneration and proliferation. The tissue reactions are typical in chronic lymph oedema. Lymph oedema may be considered as a form of chronic inflammation as there is the tendency to develop fatty tissue, malignant tumours, and fibrosclerosis.

If possible, attempt to evacuate oedema fluid initially ,then use of techniques to soften fibrosis including gentle kneading and slow skin manipulation. Foam padding under compression bandages can soften lymphostatic fibrosis. Fluid can only be directed efficiently through softened tissue.

Radiation induced fibrosis over chest wall, axilla, pelvis. Radiation causes damage to healthy tissues surrounding target area. Chronic effects are caused by pathological changes to connective and vascular systems and appear gradually. Sclerosis of the skin and subcutis may develop as well as secondary atrophic changes to the dermis. The skin may have brown pigmentation or be pale, telangiectasis, or ulceration. Dry irradiated skin lacks perspiration. Without acid mantle, and increased permeability the barrier against pathogens is compromised and increases the risk of cellulitis.

Deep breathing through diaphragm to encourage drainage of thoracic duct and to de-stress and improve sleep. Parasympathetic nervous system stimulation induces relaxation and improves digestion.

Abdominal breathing particularly stimulates the transport of lymph through the thoracic duct and R lymphatic duct. Effective for enhancing venous and lymphatic return in leg and genital oedemas. Hyperventilation and upper chest breathing involves use of accessory muscles and thereby increases tension in shoulders and thoracic outlet. Compromised gaseous exchange affects tissue health and contributes to chronic pain syndromes. As a disorganised breather, S would benefit from referral to respiratory physiotherapist to target breath control, but also as a component of relaxation strategies.

Pain management. Assessed by hospital pain management team.

MLD. Isolate and treat myofascial trigger points. Relaxation techniques, and sleep.

Pain affects up to 50% of patients with lymph oedema, with most taking regular analgesia. There are many physical causes of pain including inflammation, tissue distension, infection, ischaemia, lipoedema, nerve entrapment or neuropathy, radiation induced fibrosis, cancer recurrence.

Nerve damage from radiation is further aggravated by surgical. removal of fatty tissue along with lymph nodes. Without this radiation absorbing fatty tissue, nerves are unprotected. Direct effect of radiation on the nerves includes atrophy of axons, loss of elasticity, and damage to vessels that nourish the nerves and remove waste products. Radiation may also cause damage to nerve plexi resulting in limited range of movement or paralysis (plexopathy), and increase in pain.

Underlying adhesions associated with old scars, intensity of skin stretching may cause pain and limit movement. Strong resistance with palpation - watch body language - possibly inflammatory process. May have intolerance to pressure of deep abdominal lymphatic drainage. Scars may obstruct lymph flow,

Asymmetrical postural compensations create abnormal stress and weight bearing patterns contributing to musculo-skeletal pain. Chronic pain patients respond to physical and psychosocial stressors with increased muscle tension and slowed return to baseline.

Assessment includes noting the cause, nature, frequency, timing, site, severity and impact of the pain. Treatment strategies require the understanding of the layers of pain (procedural, incident, and background pain), and these can be influenced by emotional, environmental or psychological factors and fatigue.

Identify factors that trigger or intensify pain, and behavioural responses. Work together with patient to determine postural and sleeping positions that provide the best relief from pain. Relaxation strategies and deep breathing. Soft tissue treatments to include scar and fibrosis treatment, trigger point deactivation with subsequent stretching exercises.

Referral to osteopath for spinal mobilisation.

S had been referred to a pain clinic for assessment, but refused to continue with pain relief due to its side effects.

Education re self management with proactive approach to prevent complications such as cellulitis. Include self drainage, advice on skin and nail care, signs and symptoms of, and response to, cellulitis, and travel.

The purpose of self care is to encourage patients to be responsible for their own care and become independent. Decisions are made in partnership for manageable strategies to meet realistic goals. Results in a sense of control and empowerment.

Guidelines are discussed for the sequence and timing of a self lymphatic drainage routine in conjunction with gentle joint exercises, elevation of limbs, and deep breathing to enhance lymph movement through nodal groups. Handouts to reinforce correct techniques (eg Michael Mason). Advice is given re skin care, exercise, measures to prevent injury, signs and symptoms of cellulitis.

And sharing the potential benefits of my new knowledge and confidence.

Diet with protein and healthy food choices. Although her BMI <25, loss of weight in areas where fatty deposits would benefit S. By improving subcutaneous lymphatic drainage in these areas, and reduce stress on weight bearing joints. No cardiac or renal compromise so water intake of 1.5 to 2 litres to promote and maintain healthy tissues.

Eating a balanced diet will improve well being, increase energy levels, improve the body's ability to heal and fight infection, and keep weight at a healthy level. Good choices of fresh, unprocessed foods including proteins, vitamins and nutrients to ensure good cell nutrition.

Fat is broken down into triglycerides and glycerin in the intestine. These are resynthesised and are transported as chylomicrons into the central lymph capillary of the villi of the intestine. After a fatty meal the chyle in the cisterna chyli is creamy in colour. A diet high in long chain fatty acids puts extra load on the lymphatic system. Being overweight and obese places an increased strain on the lymphatic system as there is more tissue to drain with no increase in the number of vessels. A BMI < 25, and a waist to hip ratio > 0.80 is considered a healthy range.

Water intake over the day (not all at once) maintains steady rate of hydrostatic pressure in capillaries, consistent inflow to interstitial spaces, and therefore less stress on lymphatic capillaries. Amount of water dependent on co-morbidities causing oedema (cardiovascular, renal), and severity of lymph oedema.

Refer to dietician for assessment and advice.

Exercises for range of motion and strengthening, and to address muscular skeletal imbalances. Refer to Yoga or Pink Pilates classes. Aerobic exercise for fitness, weight loss and sleep. Swimming not appropriate due to risk of infection with lymphorrhea.

“Think of movement as an opportunity, not an inconvenience.”

Pre-existing limitations to mobility and muscular weakness should be treated along with lymph vessels or venous dysfunction, so that the entire muscle chain and all associated joints can be meaningfully incorporated into the regimen of decongestive exercise therapy.

Decongestive exercises include active exercises that increase tissue pressure near contracting muscle, compress the lymphatics - muscle pump action. Contractions can increase up to 10x during exercise. Joint movement compresses into node groups and stimulates lymphatic flow.

Referral to physiotherapist with expertise in rehabilitation for those with chronic illness to motivate S and create an exercise plan that is adapted to oedema and injuries, capabilities, achievable and suits her individual requirements. Exercise aids in weight loss and gives sense of well being.

Counselling for coping strategies for breast cancer patients.

Potential for depression and fear of recurrence or long term complications. Also issues related to sexuality. Difficult to adjust to long term illness. What do they understand about their disease? Do they understand rationale for treatment?

How does lymph oedema make them feel? How are they sleeping? Do they have family support? Are they independent or do they ask for help with daily activities?

How do they structure their day - are they motivated to complete tasks? What pleasurable activities have they participated in recently?

Assessment of living standards, support of family and friends, ability to work with lymph oedema, financial status, and participation in physical activities.

Respond to indicators in quality of life questionnaire. If not understanding disease process (due cognitive impairment / stress), then less likely to be motivated and compliant with self care advised. Depression and anxiety - may be sleeping poorly, hyperventilating,

have poor concentration, feel worthless and suicidal, become socially isolated. Physical effects on tissues include increased acidosis due to carbon dioxide retention and increased muscle tension and pain. Skin condition may deteriorate due to lack of care and risk of infection increases. May gain or lose weight as unbalanced diet also affects tissue health and healing.

If understand condition, compliant with self care, managing affairs, included in family and wider social groups, and holistic needs met, then have feeling of control over lives and greater sense of well being.

Referral to counsellor with expertise in area of chronic illness.

Skin care

Normal skin acts as a physiological barrier against external influences and water loss. The stratum corneum, (horny layer of epidermis), hydrolipid layer (acid mantle), and barrier forming lipids of horny cells ensures this function.

The skin of patients with lymph oedema can be damaged and sensitive due to impaired skin metabolism. The skin tends to be dry and itchy and prone to inflammation and infections. Because of impaired healing process, any skin injury can lead to inflammation, infection and worsening of the disease. Dry irradiated skin lacks perspiration. Without acid mantle, and with increased permeability, the barrier against pathogens is compromised and increases the risk of cellulitis.

Skin must be kept smooth and flexible to cope with compression. The interaction between the skin and the materials of compression can result in the skin becoming dry, cracked, fragile and easily damaged, with the stratum corneum separating from the deeper layers of the epidermis. Vigilance over care and protection of affected skin is essential.

Restoration with products that contain the substances that are lacking eg water, natural moisturising factors, and lipids. Use of soap free cleansing lotions which are slightly acidic (PH 5). Careful drying to prevent fungal infections, particularly between fingers and toes. A non perfumed moisturiser with a balance of natural fats and oils to form a barrier on the skin should be applied prior to application of compression bandages or garment, and at night.

Maintain skin and nail integrity with use of protection (gloves, boots, repellent, sunscreen) against cuts, insect bites, sunburn.

Refer to dermatologist for assessment of skin condition reacting to, or not improving with above care. Refer to oncologist if concerns that skin appearance suspicious of cancer. Refer to GP for treatment of fungal and small localised infections.

Urgent referral to GP or hospital for cellulitis.

Low level laser "Light amplification by stimulated emission of radiation"

The laser beam is produced when electrically activated photons pass through holes in a partial mirror. This laser does not produce heat, so has a wide range of uses relating to skin conditions. The laser light penetrates the skin and energy is absorbed and scattered. It does not penetrate bone. Depth of penetration is altered by pigmentation and can be altered to target particular structures.

Early evidence indicates that that low level laser stimulates lymphatic contractility, stimulates macrophage and fibroblasts, improves wound healing, and possibly stimulates new lymphatic growth. Clinical evidence indicates a reduction in limb size and circumference, softening of irradiated tissues and an improvement in symptoms.

Lasers help lymph oedema by softening scar tissue, softening fibrosis, and reducing pain prior to MLD on the localised area. Positive effects may not be immediate and their duration varies with individuals.

S has areas of fibrosis which may benefit from low level laser treatment. I intend to discuss the potential benefits with her in the near future.

Difficulty in developing a plan that is comprehensive but that S will accept as appropriate for her.

That will be the challenge.

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7 - SUMMARISE TX PLAN THAT WAS DEVELOPED FOLLOWING INITIAL ASSESSMENT

Holistic approach to address as many levels of S's conditions as possible within the boundaries of the treatments and advice she will accept. The treatment plan was developed in consultation with, but directed by, S. The treatment plan was modified or altered in response to tolerance and effectiveness.

Week 1:

MLD L arm - 3x weekly then assessed response and adjusted frequency. Compression - Class 2 sleeve and gauntlet as previously prescribed. S was encouraged to wear her sleeve and glove more consistently to prevent refilling after MLD.

Session 1 - MLD - stimulate lymphatic drainage - open upper pathways, assess response, short session MLD L arm.

Session 2 - MLD Abdomen - no ill effects from MLD L arm, so included abdominal and pelvic drainage.

Session 3 - S practiced self drainage of clavicles, axillae, and arm, with intention to extend range, with partner involved, at later sessions.

Kinesio taping to support alternative pathways away from L axilla for L arm and pelvic lymphoedemas.

Muscle tension - selective gentle positional releases, isometric and isotonic exercises to upper trapezius, infraspinatus, psoas, quadratus lumborum. These techniques use light pressure and are unlikely to damage lymphatic vessels while increasing range of movement and decreasing pain. Used after MLD when range of movement less restricted by oedema. Address myofascial trigger points - initially assess infraspinatus, psoas, gluteus medius to eliminate referred pain that restricts movement.

Postural awareness - advice given re postural balance - standing and sitting with even weight distribution. Suggested attendance at yoga or pink pilates classes to develop core strength. Discussed the postural compensations caused by the wearing of high heels.

Deep breathing engaging diaphragm muscle to aid in lymphatic drainage through thoracic duct. Also calming when stressed. Explained chemical change in body will reduce acidosis and may decrease pain in her tissues.

Education: Explanation with diagrams of anatomy and physiology of lymphatic system; how the body may spontaneously develop alternative drainage pathways, and how these pathways can be encouraged by a therapist and supported by self drainage. Explain the possible side effects of MLD and changes in breathing.

Written information given with verbal explanation to encourage a proactive approach to self care.

Includes: **Self drainage** diagrams and instructions

Skin care - use of aqueous, non scented moisturiser. Avoid public nail bars with multiple use equipment. Protection to arm when cooking,

gardening etc. Avoid swimming if arm leaking. Response to cuts and scratches and signs and symptoms of cellulitis. Avoid sunbathing and sunburn.

Travel advice - strategies to reduce potential risks.

Wearing of **unrestrictive clothing** (eg bra) and jewellery to enable free drainage of superficial lymphatic pathways.

Avoid **hot baths** and spas as will make Lymphoedema worse.

Advised to **contact clinic** mobile number if any concerns re state of lymphoedema.

The initial sessions were full on with information gathering and gradual increase of MLD. I felt that S was challenging me. As I was developing my assessment processes and wanted to validate my practices, I conversed with an experienced therapist as a mentor.

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8 - WHAT TREATMENTS WERE IMPLEMENTED AND THE RESULTS OF THE OBJECTIVE MEASUREMENTS?

Session 1: MLD cleared clavicles, R axilla, opened pathways across back to R axilla and R clavicle. Cleared proximal to distal along arm with focus posterior arm. Short treatment session.

Subjective: S noticed metallic taste when clearing clavicles. Tissues felt "lighter." Forearm less achy. Bladder full.

Objective: Audible abdominal gurgles (parasympathetic effect). Able to feel lymphatic response - sluggish initially at clavicles, then sustained. Noted fine wrinkles in skin of areas drained.

NB: Measurements not consistent eg increase in circumference at 20cm.

Measurements:

Upper limb	L	Change
Hand	19	Nil
Start	16	Nil
10cm	23.25	< 0.25
20cm	29	> 1cm
30cm	32	< 0.5

Measurement of the R arm after MLD would have been useful to ascertain whether the R arm has increased in volume due to redirected fluid from the L arm, or decreased due to efficient lymphatic drainage. Or remained unchanged.

Other:

Muscle energy release of tension quadratus lumborum and psoas enabled S to lie flat comfortably on treatment table.

Education - discussion re written information given. Demonstrated deep breathing techniques. Emphasis on skin care and risk factors for cellulitis.

Compression sleeve Class 2 - Jobst ready made applied.

Session 2:

Subjective - S reported indirect effect in softening of face and scalp, increased urine output with different odour, and vague nausea with tiredness for 24 hours. S is now wearing compression sleeve (but not glove) to support MLD.

MLD

As per session 1, included pelvis and abdomen.

Objective:

Response at clavicles remains sluggish initially.
Strong pull of fluid spontaneously established from L abdomen across anterior watersheds (vertical and transverse) to R lateral trunk and to R axilla
Kinesio tape used on arm and back to drain away from L axilla.

Demonstrated **self drainage technique** for clavicles, axilla and anterior chest. Reinforced **breathing technique**.

Other:

Continue to discuss issues related to care of self in general and L arm specifically.
Answer questions / encouragement / reassurance.

Later sessions:

Adjusted according to response and issues at the time.
Progressively extended focus of MLD as tolerated by S.
Extended teaching S and partner of self drainage to include all areas.

The reality of managing an hour long session to meet client expectations and not to compromise the therapeutic value of treatment by rushing is always a challenge.

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Analyze treatment Results

Manual Lymphatic Drainage

Despite stress levels and initial sluggish response, there is always significant softening of oedematous tissue after MLD as visually evident and by circumferential measurements and palpation. S states that she and her partner perform self massage regularly. Due to her many commitments S is often unable to attend weekly and often musculo-skeletal pain is her focus. MLD sessions are 4-6 weekly but are not quite controlling the oedema.

When S is compliant with the wearing of her sleeve and gauntlet during the daytime, then reduction in swelling is maintained. The sleeve appears to fit well and does not have a tendency to roll or slip. As previously stated, I believe S and I could "start again" with a programme of decongestive treatment, including daily MLD and bandaging, and reduce the swelling. I would need to convince her of the benefits of a heavy bandage.

Fibrosis

Fibrotic techniques have softened the forearm and elbow areas, but recur due to non compliance with compression sleeve. These areas would benefit from foam pads to break down fibrosis. The area at posterior L shoulder is difficult to maintain as this is difficult to compress, or be taped due to skin reaction.

Medical tape

Medical tape (kinesio) to reduce lymph oedema by directing towards unaffected node groups and return to general cardiovascular circulation. Rudimentary first attempts were surprisingly effective. S declined to be bandaged so the tapes were applied weekly, varying the positions as able. S was able to replace her tapes on her forearm and her partner helped with the shoulder and back tapes. Despite careful skin care, her skin unfortunately became irritated and itchy with early signs of a light skin rash developing. The tape was not applied when lymphorrhea was present.

The reaction to tape disappointed S as she preferred this to her garment. She always used black tape and was not daunted by public scrutiny. However, it also meant that she now wears her compression sleeve more often which appears to give a more consistent improvement.

Although S may not benefit, I am becoming more creative with problem solving using medical tape.

Muscle tension.

The range of gentle treatments that I use give S relief for up to 5 days. She is aware that the pace of her lifestyle will continue to stress her physically. Keeping busy is how she copes.

Postural awareness

I must remind her that wearing high heels does not activate the pump action of soleus muscle. This lack of action may have a long term effect on lymphatic drainage from the legs.

Deep breathing

I revisit this at the commencement of each session to engage the parasympathetic nervous system and enhance lymphatic drainage.

Skin care

S is vigilant with hygiene and skin care. This may explain why, despite the risk factors including lymphorrhoea, she has never developed cellulitis.

I will continue to examine the skin for changes in texture, colour, warmth etc.

Exercise programme.

Again time constraints and limits of ongoing chronic pain have curtailed the opportunity to commence a specific exercise programme.

Footnote

S has been a client for 3 years. Sometimes there is progress made, other times the lymph oedema worsens. This worsening of oedema and pain is almost always related to increased stress levels. S is an assertive, intelligent woman who is aware of, and able to articulate rather descriptively, what is happening in her body. The sessions can be repetitive with some progress made, but I feel that we are merely marking time.

With renewed confidence, I will revisit the treatment options with S.

- a decongestive phase as above with MLD plus with compression bandaging
- use of foam pads (mobiderm) to break down fibrosis
- during maintenance phase discuss the benefits of consistently wearing a compression sleeve with overnight compression also.
- firm emphasis on benefits of consistent self management.
- discuss low level laser to break down areas of fibrosis.
- discuss Coban as alternative to heavy bandage
- garment to contain oedema and fibrosis at L posterior shoulder.

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Select issue for self directed learning:

As a therapist in private practice in a health district where there is now a public lymphoedma service, I do not now see many complex cases. I feel that my assessment skills in regards to differential diagnoses need constant revisiting. I receive medical and surgical referrals, but I do sometimes question the level of knowledge of the referee in regards to lymphodema. I would like to feel confident to question and put forward suggestions to a specialist or general practitioner if I consider that further investigation is required.

S purchased her own kinesio tape and asked me to use it. I had a vague idea of the principles and practised on S. The early attempts were rudimentary - but it worked! I attended a workshop and questioned other therapists. Between clinic appointments, S used kinesio tape with confidence until her skin became itchy with a rash and stopped using it. I would further like to explore the techniques of applying kinesio tape.

Re this case study:

On reflection I have been frustrated at times and questioned my intent with this client. However, this is my feeling and if a client has all the information and options for treatment then ultimately the choice is hers to continue. Is this a compromise or the best outcome? Non-compliance is not an appropriate term in this case as S sets her agenda. However, I feel that I am not making substantial gains in terms of improvement overall. S would benefit from daily MLD with compression bandaging to maintain reductions achieved. Are there other options I can offer?

Extra note:

During the writing of this case study the mother of S was confronted at night by an intruder and is so severely traumatised that S is looking for rest home care for her mother. Her husband collapsed and spent some time in hospital and her GP, with whom she has had a close relationship over many years has died. S is so stressed and exhausted. She sleeps poorly, her pain is becoming generalised, and her lymphoedema is more resistant to MLD. Her treatments are currently 2-3 weeks apart but she states that she wants "to see you more often but there are just not enough hours in the day to do everything." Her main treatment focus currently is to reduce pain in pelvis and lower back so that she is mobile. Her partner assists with lymphatic drainage of her L arm.

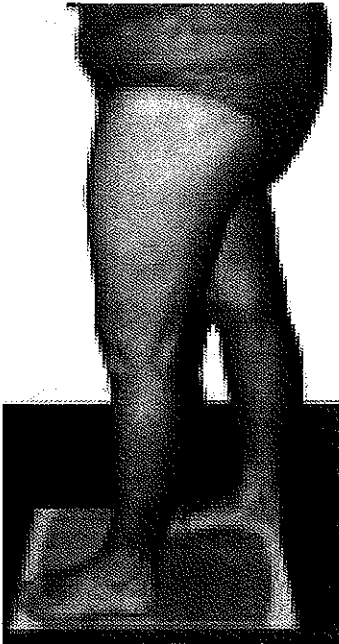
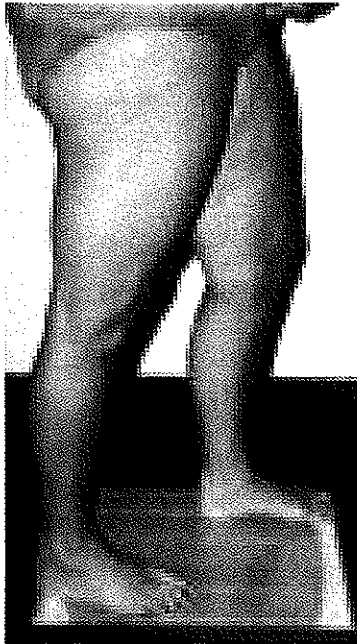
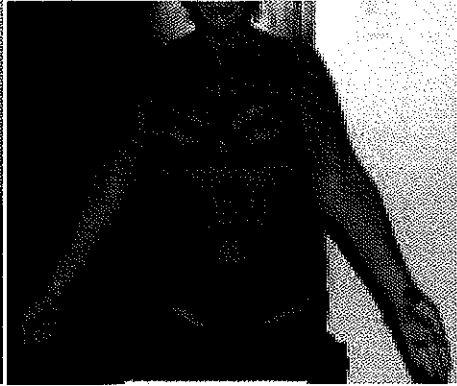
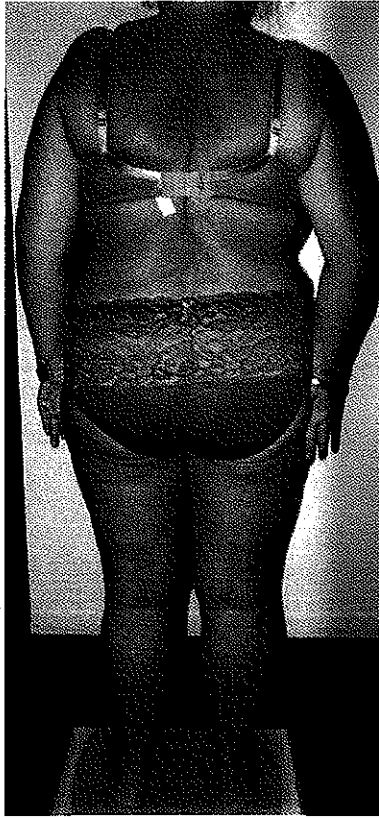
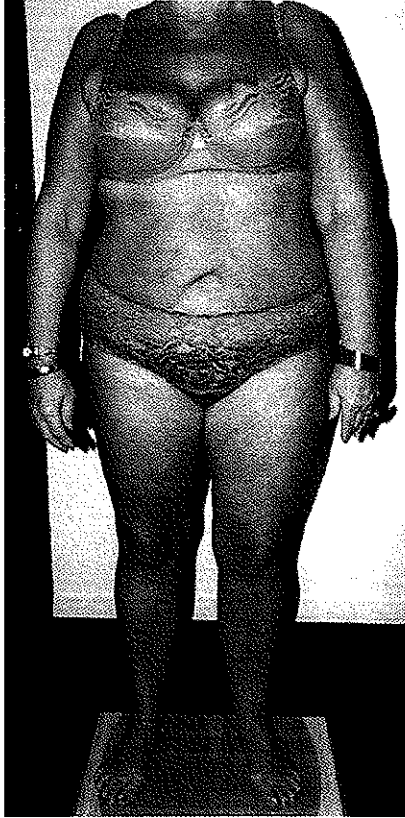
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People and their lives are complex. Its not just the lymphoedema, is it?

No change here!

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Session 1 - Pre MLD



Session 2

