

Complex lower-limb lymphatic drainage in a patient with Non-Hodgkin's lymphoma impacting left inguinal lymph nodes: a case study

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Key words

Case reports, drainage, lymphoedema, manual lymphatic, rehabilitation

Abstract

Lymphoedema is a significant side effect of cancer treatment and can result in ongoing limb oedema and reduced quality of life. This case study highlights the challenges of managing lower-limb lymphoedema in a 70-year-old female with a history of breast cancer, with bilateral axillary node dissection, and a recent diagnosis of Non-Hodgkin's Lymphoma in left inguinal nodes. The challenges associated with ongoing medical complications and limited available lymphatic pathways are discussed. The ongoing relationship, developing trust and ensuring good communication between the lymphoedema therapist and the patient are essential in managing symptoms and providing relief from discomfort, to optimise quality of life.

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Hilda was a 70-year-old widow who lived alone in her own home. Prior to a recent diagnosis of Non-Hodgkin's Lymphoma, she was in good health and active in her local community with a zest for life. During retirement, she maintained a part-time job. She did not have any formal help regarding her condition; however, she had a large extended family, most of whom lived nearby.

In March 2000, when Hilda was 50 years old, she was diagnosed with hormone-dependent left breast cancer. She underwent a lumpectomy and axillary dissection with 14 lymph nodes removed, none of which tested positive for cancer. This was followed by radiotherapy and a 10-year course of chemotherapy, including 5 years of tamoxiphine.

During an interview, Hilda indicated she had received complex lymphoedema therapy (CLT), including manual lymphatic drainage and daily use of compression garments, several years post-surgery. Five years post-surgery, she ceased wearing her compression garment and had no further formal treatment. Her self-management revolved around exercise. She reported full function of her left arm.

In 2003, she was diagnosed with cancer in the right axillary lymph nodes and underwent bilateral axillary dissection with two bouts of surgery on the right. The number of lymph nodes removed was not indicated, however, two lymph nodes tested positive for cancer. She did not experience any lymphoedema or other complications in her right arm post-surgery.

In 2004, Hilda had breast reduction surgery. She experienced no post-surgical

complications, and her scars were soft and well healed, causing no restrictions to movement. Hilda was monitored every 3 months for the first 3 years, then 6-monthly for the next 3–4 years. After this time and until 2020, when she continued to remain well and free of cancer, she was monitored yearly, including an annual mammogram.

In September 2020, she reported feeling an unusual pressure in her left breast/axillary region. A punch biopsy confirmed this was a small cell non-Hodgkin's lymphoma. She was advised she did not need any additional treatment; it would just be monitored.

Approximately 3 weeks later, she noticed swelling in her left foot and genital area followed by swelling and painful palpable nodes in her left groin. A CT scan indicated several cancerous spots throughout her trunk. She was diagnosed with non-

Hodgkin's lymphoma grade 1/2, and she required a course of chemotherapy, which commenced in December 2020.

Assessment results

Her medical history indicated periods of hypertension, gastric reflux and leg cramps for which she was medicated.

In late-October 2020, Hilda had mild non-pitting oedema of her left foot and visible swelling in her left groin (which was tender on palpation). She reported a noticeable increase in size of the left inguinal lymph nodes and indicated that at this time there was significant swelling in her left leg, but not her toes, and discomfort on bending and walking. She commenced CLT with some good effect, and 2 weeks later she started bandaging. This contributed to a significant reduction in leg swelling.

She commenced chemotherapy 7 weeks later, and 1 week her swelling had reduced completely. Circumferential measurements of her left leg indicated it was back to normal, and equal to her unaffected right leg (*Table 1*). Unfortunately, it did not remain this way and began to progressively swell. These changes led to the following treatment plan.

Treatment plan

Her chemotherapy treatment plan anticipated infusion twice per week for six months. She was advised by her oncologist to walk about 2 km daily to maintain her functionality and to help the body generally manage the chemotherapy. CLT was prescribed by her GP in blocks of 10 sessions used when required and supplemented by a family member trained in lymphoedema therapy. Her family member was instructed to assist her with gentle exercises targeting posture, clavicular nodes, axillary nodes and inguinal nodes, as well as some deep breathing exercises.

Expected outcome

After the initial positive response to the chemotherapy treatment, it was anticipated that the left inguinal nodes would continue to reduce in size as the cancer cells dissipated and lymphatic flow normalised, and she would experience a reduction/resolution of her leg oedema.

Actual outcome

Hilda's second chemotherapy session was delayed by 1 week. The third session proceeded as planned, however, the fourth,

fifth and sixth sessions were significantly delayed due to reduced white blood cell (WBC) counts.

In early January 2021, Hilda began experiencing ongoing oedema. Initially the swelling occurred every 2–3 days but resolved overnight and with MLD. The area of swelling varied from the ankle to her thigh. Given her history of bilateral axillary dissection, and presentation of left groin oedema, the goals of MLD were to reduce and disperse oedema from her left groin and direct the lymph to her right inguinal and left popliteal nodes. She commenced with bandaging with a reported good outcome. She was considered inappropriate for a compression garment at this stage.

By mid-April, the leg oedema became persistent with an overall limb volume increase of 22% (*Table 1*). It no longer resolved overnight and had significant

pitting in the left foot and lower leg. CLT was increased to three times per week with additional MLD and bandaging performed by a lymphoedema therapist. During this period, Hilda began to experience extreme, sharp pain in her thigh. This commonly extended from her groin to her inner thigh and knee. DVT was ruled out and it was suggested the pain was due to nerve interruption resulting from swollen nodes and blocked lymphatics. She commenced daily Morphine with good effect, however the intense pain returned intermittently.

By mid-May, her left leg volume had increased to 35% over normal (*Table 1* and *Figures 1, 2* and *3*). Fibrotic changes (detected by observation and palpation) appeared around the popliteal region and inner thigh. There was increased oedema across her pubic symphysis suggesting restricted lymphatic flow from this area.

Table 1. Hilda's left leg measurements from January–May 2021.

LEFT LOWER-EXTREMITY MEASUREMENTS — Hilda				
	DATE: 24/01/2021		DATE: 13/04/2021	DATE: 15/05/2021
	RIGHT	LEFT	LEFT	LEFT
Foot (MTP)		21.1	21.4	23
Ankle (10cm from heel)		19.5	22.2	22.9
4 cm		20	22.5	23.2
8 cm		23.9	25.8	26.4
12 cm		28.5	31.7	32.5
16 cm		33.7	36.7	37.4
20 cm		35.5	38.4	40.3
24 cm		34.6	37	40.3
28 cm		34.7	36.4	39.3
32 cm			39.3	42.8
36 cm			42	46.8
40 cm			44.3	49.9
44 cm			48	52.6
48 cm			51.5	59.4
52 cm			55.5	62.5
56 cm			58.8	64
Vol Lower	0	2215.7	2,605.4	2,867.1
Vol Upper	0	5336.4	6,623.9	7,335.3
Limb Vol	0	7552.2	9,229.2	10,202
LE Vol	7,552.2		9,229.2	10,202
Limb Red			-1677	-2,650
% Limb Red			-22.21	-35.09

Case report



Figure 1. Hilda, May 2021.



Figure 2. Hilda, May 2021.



Figure 3 - Hilda, May 2021.

MLD was provided every 1–2 days along with regular bandaging.

She reported significant improvement in movement/comfort post MLD. However, this was not sustained, and her limb again became swollen, requiring further MLD. In late-May 2021, a CT scan showed reduction in cancer cells throughout the body except the left inguinal nodes. These had enlarged. Biopsy confirmed Non-Hodgkins Lymphoma, grade 3b. There was also a phlebotrombosis in her left inguinal nodes. MLD was immediately ceased. She was advised that MLD would not be possible for 6 weeks, but this was later changed by her oncologist, and she was allowed to continue it.

Hilda had difficulty maintaining bandaging due mainly to slippage down her leg. She would remove the bandages during the night or early morning, be active for several hours without them. She would also remove them if she had to go out. She obtained mild relief from standard stockings until she was prescribed a custom flat knit medical compression garment for daytime wear.

Discussion

This case presented a significant challenge for the lymphoedema therapists due to the limited resources, compromised lymphatic pathways and medical complications. A high degree of flexibility and trust between therapist and patient were required to enable appropriate response to rapidly changing

condition. The key interventions employed as part of CLT were skin care, exercise, MLD and short-stretch bandaging (Lasinski et al, 2012). MLD as we know helps move lymph to functional drainage areas and subsequently reduces oedema (Ostby et al, 2014; Ezzo et al, 2015). Its gentle pressure can also help in improving quality of life (Shaitelman et al, 2015) although its extent is unclear (Müller et al, 2018). Hilda reported both MLD and bandaging brought relief, reduced pain and increased comfort. During MLD sessions, lymphatic fluid was primarily directed from the left inferior inguinal lymphosome to the right superior inguinal lymphosome and the left popliteal lymphosome (Suami and Scaglioni, 2018). This was based on evidence that after dissection, lymphatic vessels cross the front midline horizontally to connect to the contralateral lymph nodes (Suami et al, 2018). In the latter stages of treatment (when the inguinal nodes were increasingly compromised), the MLD focus shifted to the lateral axillary and pectoral lymphosomes (Suami and Scaglioni, 2018).

Indocyanine green (ICG) fluorescence lymphography could have been used in Hilda's case but this was not an option available to her.

Compression therapy is one of the foundations of lymphoedema management (Moffatt et al, 2012; International Society of Lymphology, 2020). Compression through the use of inelastic, short-stretch bandages is an effective way to reduce oedema, prior to prescription of compression garments

(Todd, 2015). However, there are several challenges for the individual with maintaining bandages. For Hilda, she drove a manual car and was unable to drive while her left leg was bandaged. In addition, the added thickness around her foot made wearing shoes difficult, so during periods of activity she would prefer to remove the bandages.

Unfortunately, this reduced the effectiveness gained from compression working together with the muscle pump (Moffatt et al, 2012; Todd, 2015). Wearing the bandages limited the times she was able to complete her daily activities and subsequently she had prolonged periods without any compression. Due to pain waking her while sleeping, Hilda would often remove bandages overnight. For functional reasons (unable to wear a normal shoe or bend her leg) she would generally remove her bandages each morning and leave them off for the rest of the day. Given Hilda was a very active person, she would frequently experience increased swelling and discomfort in the evenings.

In addition, Hilda would experience slippage of the bandages due to reduction of oedema. A potential alternative to bandages would be adjustable Velcro compression wraps (Mosti et al, 2015; Williams, 2016). These allow the individual to adjust the tightness in response to swelling or discomfort, thereby maintaining sufficient compression. These were not available in her case.

Hilda's fluctuating oedema meant prescribing an appropriate compression

garment was difficult. The continued reduction in outflow via the inguinal lymph nodes resulted in a continual increase in overall volume of the left leg. This impacted on Hilda's wellbeing and significantly challenged her ability to maintain a positive outlook.

Conclusion

This case highlights the importance of the patient-therapist relationship in being able to adapt and respond to the changing needs of the patient. Based on objective measures, the established trust and communication allow therapy to be directed to areas of most need whilst also balancing the management of symptoms and activities of daily living. The input of the lymphoedema therapist has been crucial for maintaining functional use of the limb in terms of range of movement, providing pain relief, and reducing overall oedema. Bandaging provided a reduction in oedema; however, this has not been maintained due to the long periods of no compression. A more robust, custom form of compression therapy is required to ensure ongoing compression. This needs to be balanced with cost, wearability, ability to don/doff and capacity to adapt to fluctuating levels of oedema.

This case also emphasises challenges with current management approaches during an

acute treatment phase to manage rapidly changing, ongoing lymphoedema. Hilda had access to a lymphoedema therapist on a daily basis (family member), but for other patients who rely on a doctor's prescription to receive a limited block of CLT, and need to physically attend a clinic, the level of input required may be greater than the capacity to complete the treatment.

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Consent

This study has been approved by Flinders University's Human Research Ethics Committee (Project ID 5517). Written consent was provided by Hilda. She also reviewed the final report and provided verbal confirmation of accuracy of information and consent to publish.

Conflict of Interest

The authors report no conflicts of interest.

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