Extended follow-up of simple lymph node graft treatment of upper limb lymphoedema

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Case report

During 2009, a 65-year-old female had wide local excision of a left breast carcinoma, axillary lymph node clearance, and chemo- and radio-therapies. Long-term endocrine treatment was instigated. In 2012, recurrent carcinoma was treated by mastectomy and adjuvant chemotherapy.

The patient developed International Society of Lymphology Stage II lymphoedema of the non-dominant left upper limb. This reduced function, caused discomfort and required full-time compression sleeve wear. According to truncal cone volume calculations based on wrist and elbow circumference measurements, the affected forearm was approximately 870ml larger than the unaffected right.

During November 2013, with intravenous sedation and local anaesthetic at donor and recipient sites, the patient underwent simple Lymph Node Grafting (LNG) as treatment for this lymphoedema. Injected subcutaneous methylene blue dye was used to identify two left inguinal nodes, which were harvested for free-grafting. Through small incisions into subcutaneous tissue, one isolated node was implanted proximal to the left elbow, and the other to the distal volar forearm. The procedure took 30 minutes. Post-operative oral Flucloxacillin was prescribed. No donor limb lymphoedema or other complications occurred.

At three months post-operation, the patient declared improvement in lymphoedema symptoms. Compared with pre-operation, the left forearm volume had decreased by about 315ml. This was a 36% reduction in the extra bulk of this forearm.

The LNG procedure was repeated in September 2014. Single right inguinal nodes were transferred to each of proximal and mid volar left forearm sites. There were no complications.

In April 2016, the patient reported markedly improved sensation (tightness, heaviness, numbness) and hand and arm function, with increased ease of self-care (combing hair, dressing). She continued compression sleeve wear. The left forearm volume was approximately 580ml smaller than before the first LNG. This was a 67% decrease in the pre-surgery excess volume of this forearm over the other, which had increased by 40ml during the same period.

During June 2016, technetium tracer was injected into the skin of the left hand and distal forearm. Lymphoscintigraphy revealed tracer flowing away from both injection sites, concentrating in transplanted nodes, and exiting the limb.

Discussion

Upper limb lymphoedema after axillary lymph node clearance and radiotherapy to treat breast cancer is common in New Zealand. The physical and psychological morbidities associated are frequent and incapacitating. Many treatments have been used to manage the condition once established, but limb compression and physiotherapy remain mainstays. Prevention or cure would bestow significant benefit to patients and the healthcare system.

Attempted cures have included microsurgical creation of drainage channels through lymphatico-lymphatic and lymphaticovenous anastomoses. However, en bloc microvascular lymph node transfer in which a soft
tissue flap with its arteriovenous supply is grafted to the axilla or wrist has enjoyed most success, with very good results for some patients.1–3 However, being technically difficult and time consuming, these surgeries are expensive. LNG may be an alternative.4

Skin and fat are regularly free-grafted during plastic surgery, with survival dependent on blood vessel ingrowth. The extended viability of nodes noted on lymphoscintigraphy in the LNG case reported suggests that the same occurs with this free-grafted tissue.

The substantial and incremental reduction in forearm volume of the reported patient with repeated LNG confirms efficacy of this technique. This may occur through natural anastomosis of grafted nodes with existing limb lymphatics, with interstitial fluid accumulation in and subsequent removal from the nodes and limb via lymphaticovenous transfer.5,6 It has been postulated that as well as inducing lymphatic anastomoses, these nodes may be involved in pumping lymph into the venous system.1

If, as this report suggests, LNG can achieve long-term results comparable to or better than complex microvascular surgery, at reduced risk of donor limb lymphoedema, and with the opportunity to titrate effect with repeat procedures, then it may prove useful for prevention and early treatment of cancer-related lymphoedema.

Competing interests:
Nil.

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REFERENCES: