CASE REPORT

Vascularized Lymph Node Transfer From Thoracodorsal Axis for Congenital and Post Filarial Lymphedema of the Lower Limb

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Vascularized lymph node transfer is becoming a popular method to treat lymphedema. We have performed vascularized lymph node transfer for two patients, one with congenital and the other with post filarial lymphedema of the lower limb. Lymph node transfer was performed from the thoracodorsal axis. Both cases exhibited improved results in both limb circumference and quality of life measurements.
J. Surg. Oncol. © 2016 Wiley Periodicals, Inc.

KEY WORDS: vascularized lymph node transfer; congenital lymphedema; filarial lymphedema

INTRODUCTION

The surgical management of lymphedema whether primary or secondary is still evolving, from the times of decongestive therapy and debulking to lymphatic surgeries. The vascularized lymph node transfer is reliable, with reproducible results [1,2]. It creates neo-lymphatics, improves limb mobility, and function in addition to reducing the volume.

METHODS

There were 2 patients identified with lower limb lymphedema. One was a case of congenital type and another filarial lymphedema of right lower limb. We recorded the clinical outcomes up to 6 months post operatively. The health status was evaluated by Euro QOL 5D, which was done pre-operatively and again at 6 months post-op.

CASE REPORTS

Case I

A 2-year child was brought to us with congenital lymphedema of the right lower limb in 2004. He was started on regular massage and complete decongestive therapy. He was brought again at 13 years of age, with International Society of Lymphology- grade III lymphedema [3] with skin changes of hyperkeratosis and pigmentation and history of recurrent lymphangitis. He also had recurrent hydrocele on the right side (Fig. 1).

Though there were no problems with self-care or day to day activities, he could not completely flex his knee, had never worn normal footwear and kept avoiding physical activities at school. He was unable to run long or fast and could not play common sports owing to the heaviness in his right lower limb and easy fatigability.

On evaluating his pre-operative functional status using the Euroqol EQ-5D [4], he gave a health state rating of 70%. His pre-operative Tc-99m lymphoscintigraphy showed no uptake of tracer upto 4 hr (Fig. 2).

Case II

Our second patient was a 41-year old salesman who presented with filarial lymphedema of the right lower limb of 3 years duration. He had undergone a left above knee amputation following filarial lymphedema 12 years prior, with recurrence of lymphedema in the amputated stump. His chief complaints were lymphorrhea from the right foot and inability to wear a prosthesis on the left above knee stump. There were multiple admissions for recurrent lymphangitis. On examination, there was cobblestone appearance of the right foot and distal 1/3rd of leg, enlarged square shaped toes, positive stemmer's sign and lost ankle contour implying ISL grade III lymphedema [3] with complications (Fig. 3).

Given that he was a salesman, having lost his job 20 years back at the onset of problems in the left leg and totally dependent on his family after left above knee amputation, saving the right leg was paramount.

Preoperative Tc-99m lymphoscintigraphy showed dilated lymphatic channels in the dermis of the right foot and leg with tracer retention and delayed visualization of the inguinal nodes suggesting significant destruction of the lymphatics. He underwent vascularized left axillary lymph node transfer from the thoracodorsal axis.

SURGICAL TECHNIQUE

For the adult patient, the first step was reverse lymphatic mapping on the day of surgery performed an hour before he was given anaesthesia. 0.5 mCi of Tc-99 m albumin micro colloid was injected in the 2nd, 3rd, and 4th web spaces of the left upper limb. After tracer injection patient

The authors have no other affiliations, grants or funding. The content of the article reflects our experience.

Conflict of interest: We have nothing to disclose.

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Received 8 June 2016; Accepted 1 July 2016

DOI 10.1002/jso.24374

Published online in Wiley Online Library (wileyonlinelibrary.com).

Fig. 1. Pre operative picture of patient 1.

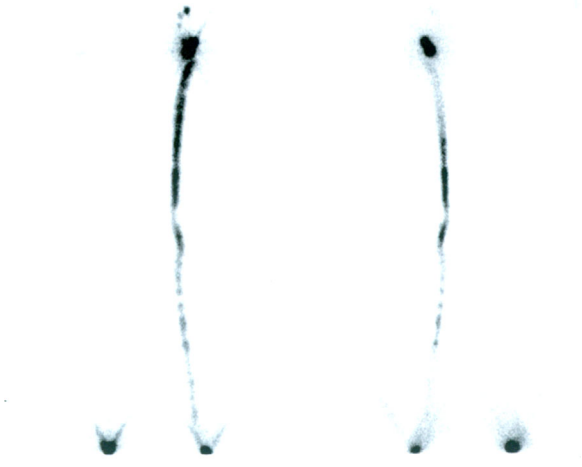

Fig. 2. Pre operative lymphoscintigraphy of patient 1 showing absent lymphatics in the right lower limb.

was shifted to the operating room. Following injection, we proceeded with preparation of the recipient site. The posterior tibial vessels were used as the recipient. In the first patient, recipient vessels were anterior tibial in the ankle. The site of lymph node harvest was based on the recipient vessels used—ipsilateral axilla for anterior tibial vessels and contralateral axilla for posterior tibial vessels. This facilitates having two teams working simultaneously for harvest, inset, anastomosis, and donor site closure.

HARVESTING THE FLAP

Once the recipient site was prepared, we moved towards the axilla to harvest axillary lymph nodes. Incisions were made along the anterior axillary fold in the classic manner as harvesting latissimus dorsi flap. Once the axilla was surgically exposed, the subcutaneous fat and lymphatics were visible (Figs. 4–6).

We use the gamma probe to avoid damaging nodes draining the limb, which would show signal on the Geiger counter. A longitudinal skin island along the anterior axillary fold was also harvested for post-operative monitoring and ease of recipient site closure. The thoracodorsal nerve was carefully separated out from the vascular pedicle and the flap harvested with sufficient amount of fat and lymphatics along the thoracodorsal axis. Donor site was closed over a negative suction drain (Figs. 7–10).

The gamma probe was moved across the harvested flap again to find any nodes which may show tracer signal. We have not used ICG tracer on the chest wall in either of the patients. Once the flap was inset in position, the skin island was anchored to the surrounding skin. In the adult patient in view of severe fibrosis, skin closure was not possible and hence the flap was covered with skin grafting. Patients were kept with lower limb elevation post operatively for 10 days. After 2 weeks gentle compression with crepe bandage was given and non-weight bearing mobilization started at 3 weeks. They were given custom made compression garments.

RESULTS

Both flaps and skin paddles survived with no donor site morbidity. In the first patient there was reduction in the size of knee, ankle, and toes with improvement in their movements. At 6 month follow up, the first patient had 9% reduction in the circumference as measured at standard levels. In the second patient, at the 2nd month follow up, there was reduction in size as well as complete cessation of lymphatic leakage from the skin, significant improvement in the champagne bottle appearance of the leg and improved toe gaps. The reduction in size of the limb was 6%.

The reduction in size and subjective improvement in the form of softness of skin were maintained over the period of time in both patients. At the 6 month post-operative visit, the first patient gave an EQ5D health state feedback of 95% from 70% pre-operatively. Also, the patient had improved mobility and was playing sports with ease. The second patient reported that his right lower limb felt lighter, which made walking and driving easier. He was particularly very happy with the stoppage of lymphorrhea which made him feel socially awkward. His EQ5D health state improved from 50% pre-operatively to 75% at 6 months post-op.

In the first patient, follow up Tc-99 m scan showed good uptake in the transferred lymph nodes with neovascularisation. (Fig. 11). Both patients were extremely satisfied with the procedure and continue to wear customized pressure garments (Figs. 12, and 13).

DISCUSSION

The incidence of primary lymphedema was found to be 1:6,000 to 10,000 live births [5]. Now we have a better understanding of the exact

Fig. 3. Pre operative picture of patient 2.

Fig. 4. Markings for the harvest of axillary lymph nodes.

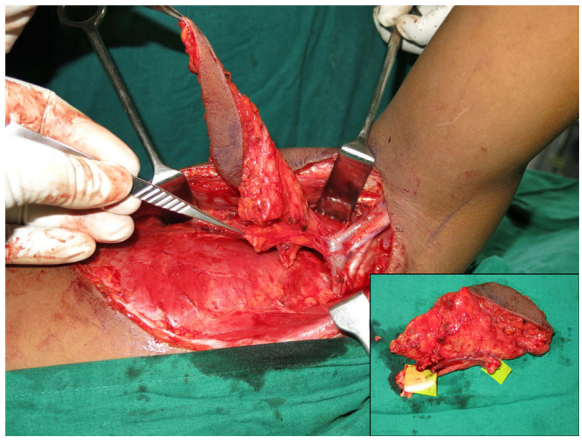

Fig. 5. Harvest of vascularized lymph nodes based on latissimus dorsi pedicle.

Fig. 6. Inset of the vascularized lymph nodes with the latissimus dorsi pedicle in patient 1.

Fig. 7. Gamma probe was used to selectively avoid nodes draining the upper limb while harvesting the axillary lymphnodes.

Fig. 8. Gamma probe.

Fig. 9. Gamma probe run over the flap shows no activity, implying that the nodes draining upper limb were excluded from the flap.

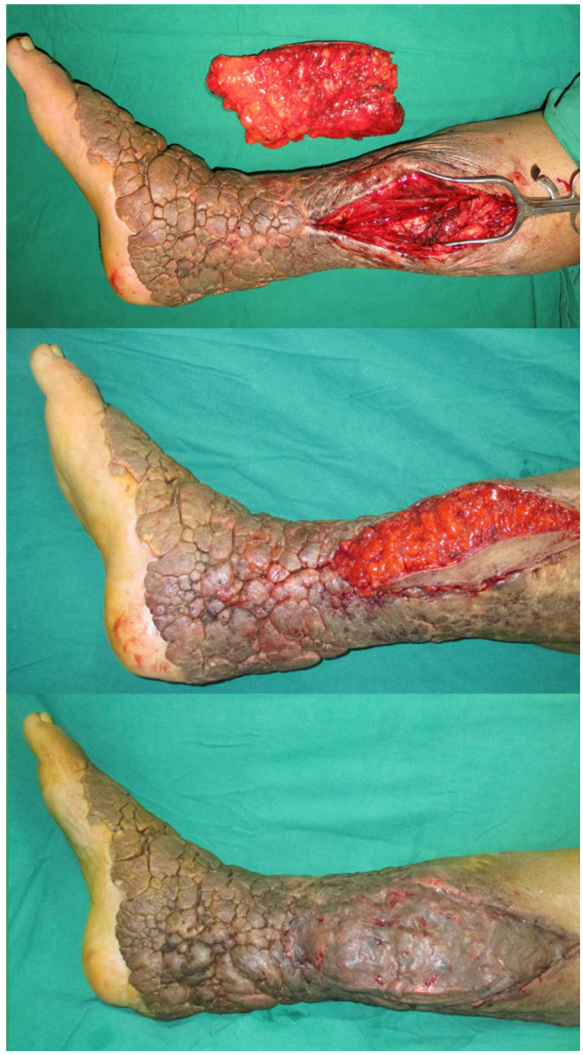

Fig. 10. Vascularized lymph node flap inset in patient 2.

pathophysiology and also recent advances in treatment modalities. Lymphedema was treated conservatively by massage and complete decongestive therapy. The results of nodovenous and lymphovenous surgeries were not reproduced at all centers with consistency. Hence excisional surgery is still preferred in filarial lymphedema against lymphovenous surgery [6]. There is good evidence available suggesting lymphatic drainage occuring after free vascularized lymph node transfers [1,7].

CONCLUSIONS

Vascularized lymph node transfer of lower extremity is a reliable procedure with significant improvement of lower extremity lymphedema. The vascularized lymph node flap from the thoracodorsal axis is dependable and has a large pedicle with sufficient sub-cutaneous fat and lymphatic tissues. Intraoperative Gamma Probe is extremely useful to avoid donor site complications.

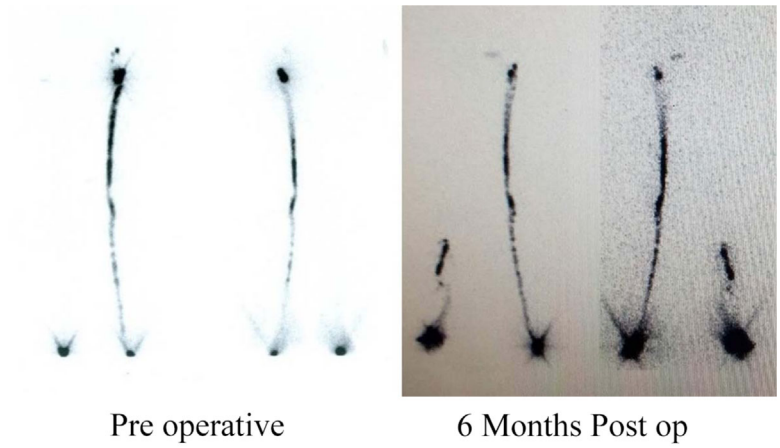

Fig. 11. The post op lymphoscintigraphy in the 1st patient shows neo-lymphatics when compared to pre op.

Fig. 12. Comparison of pre operative and 6 months post operative limb measurements in patient 1.

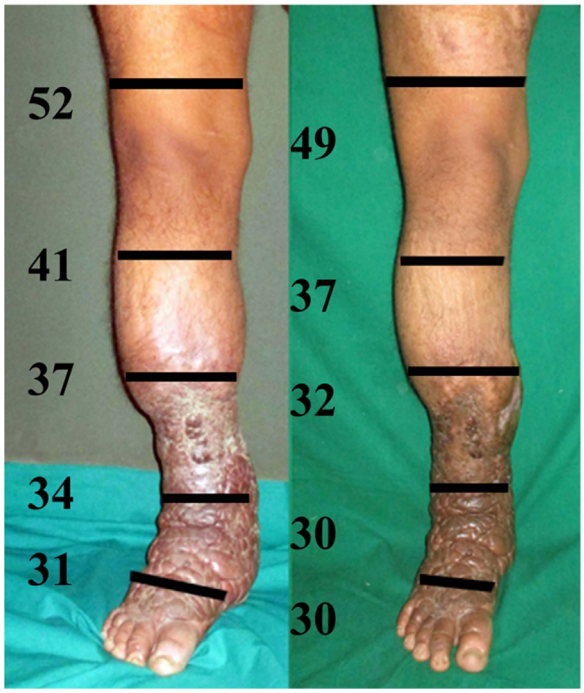

Fig. 13. Comparison of pre operative and 6 months post operative limb measurements in patient 2.

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