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SUPERMICROSURGICAL LYMPHATICOVENULAR ANASTOMOSIS FOR A BREAST LYMPHEDEMA SECONDARY TO VASCULARIZED AXILLARY LYMPH NODE FLAP TRANSFER

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ABSTRACT

Breast lymphedema (BLE) can occur after breast cancer treatments, but there have been no cases of BLE secondary to lymph node transfer (LNT) using an axillary lymph node (ALN). We report the first case of LNT-related BLE successfully treated with supermicrosurgical lymphaticovenular anastomosis (LVA). A 50-year-old female presented with left BLE after LNT harvesting from the left axilla for the treatment of secondary lower extremity lymphedema in another hospital. Although the left breast did not seem edematous, the patient suffered from sensation of tension and frequent episodes of left breast cellulitis. Since conservative treatments were not effective, LVA was performed at the lateral thoracic region. A 0.5 mm lymphatic vessel was found and anastomosed to a nearby 0.35 mm vein in an intima-to-intima coaptation manner. After the LVA, the patient experienced no sensation of tension or further cellulitis attacks. Although rarely encountered, BLE can occur after axillary LNT, and LVA may be a useful therapeutic option.

Keywords: breast cancer, lymphedema, lymph node transfer, microsurgery, supermicrosurgery, lymphaticovenular, anastomosis, cellulitis

Breast lymphedema (BLE) can occur after interventions to the axillary lymph nodes (ALN) and can cause not only breast edema but also sensation of tension and inflammatory changes such as breast cellulitis (1,2). There are several BLE cases in the literature, and appropriate diagnosis and treatments are important for management of the disease. However, no case has been reported regarding BLE after axillary lymph node transfer (LNT). In this report, we present a case of progressive BLE after axillary LNT for the treatment of lower extremity lymphedema that was successfully treated with supermicrosurgical lymphaticovenular anastomosis (LVA).

CASE REPORT

A 50-year-old female suffered from severe sensation of tension and increasing frequency of cellulitis episodes of the left breast. The patient had undergone left axillary LNT for the treatment of lower extremity lymphedema secondary to uterine cancer treatments in another hospital 2 years before first visit to our hospital. Six months after the LNT, she experienced the first episodes of left breast cellulitis; there were no episodes of mastitis or cellulitis of the left breast before the LNT operation. Thereafter, the patient suffered severe sensation of

Fig. 1. Breast lymphedema after lymph node transfer from the axilla. The breast was reddish due to frequent episodes of cellulitis.

tension of the left breast, and frequency of left breast cellulitis increased to 5 times a year. Intravenous cephazolin was administered for at least 5 days when breast cellulitis appeared. Although conservative treatments including skin care and compression were performed, the condition became worse and patient was referred to our hospital 18 months after development of left BLE. The left breast was reddish due to frequent episodes of cellulitis. Although it was not apparently edematous at a glance, physical examination revealed pitting edema. (*Fig. 1*). Since BLE was refractory to conservative treatments, we decided to perform LVA to improve the condition. The patient had claustrophobia and allergy to contrast agents, and magnetic resonance imaging, lymphoscintigraphy, or indocyanine green lymphography could not be performed to evaluate BLE and locate lymphatic vessels (3,4).

Operation was performed as outpatient surgery under local infiltration anesthesia in a supine position. A skin incision was made on the previous scar of the LNT operation, and subcutaneous tissue was dissected distally and medially from the surgical field to locate a lymphatic vessel and a vein suitable for LVA below the superficial fascia. There was no finding suggesting venous hypertension or tissue congestion, and venous edema was not considered a cause of swelling. A 0.5 mm non-sclerotic lymphatic vessel was found and supermicrosurgically anastomosed to a 0.35 mm vein running medial to the scar tissue using 11-0 nylon in an intima-to-intima coaptation manner (*Fig. 2*). After confirming anastomosis patency with no lymph leakage under microscopic observation, the wound was closed without placing a drain. Operation time was 25 minutes.

Postoperative course was uneventful. No postoperative antibiotics were given as maintenance therapy. After the LVA, the patient reported disappearance of the sensation of tension and did not experience recurrence of left breast cellulitis. At 1 year postoperative follow-up, there were no subjective symptoms, objective findings of BLE, or further cellulitis attacks, and patient satisfaction was high.

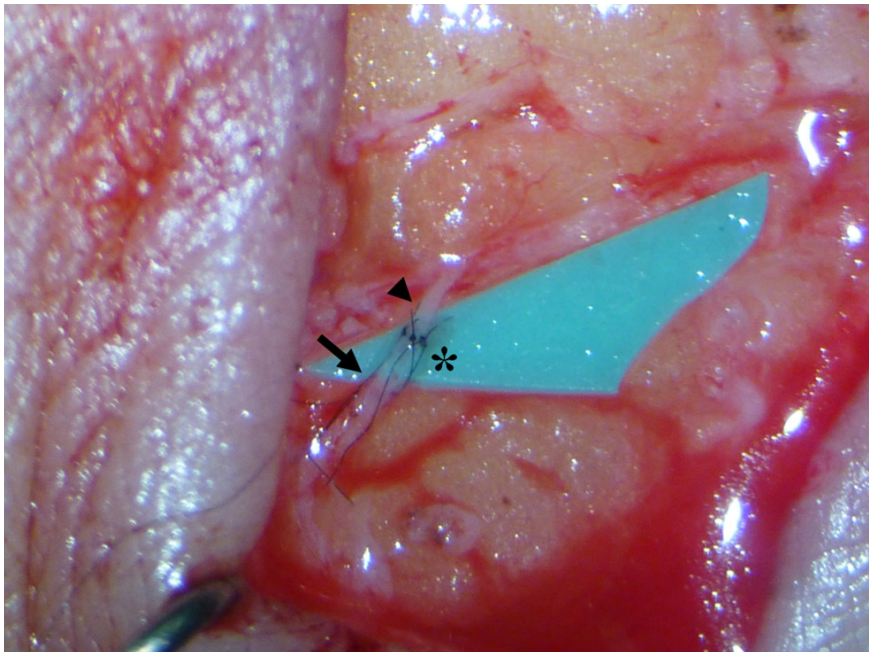

Fig. 2. Supermicrosurgical lymphaticovenular anastomosis (asterisk). A lymphatic vessel (arrow) was anastomosed to a nearby vein (arrowhead).

DISCUSSION

Supermicrosurgical LVA was effective for this case of BLE. An expanded lateral thoracic lymphatic vessel was found and anastomosed likely resulting in effective breast lymph drainage into venous circulation. Duration of BLE was not longstanding in this case (a factor which is associated with successful results after LVA) and the lymphatic vessels were not sclerotic (5-9). This case demonstrates that after LNT, surgeons need to pay attention to the lymph node flap donor site to ensure early diagnosis and treatment for optimal management of potential donor site lymphedema. We consider LVA as the best therapeutic method for donor site lymphedema due to its minimal invasiveness.

Vascularized LNT is becoming popular for the treatment of progressive lymphedema (10-14). A transferred lymph node flap leads to lymphangiogenesis between the flap and the surrounding tissue, which allows effective lymph drainage into the flap via the lymphangiogenesis. Lymph drained into the flap then flows into venous circulation through native lymphovenous shunts within the lymph node. Unlike LVA, LNT can be effective for advanced lymphedema cases with severe lymphosclerosis. However, this requires general anesthesia, longer operation time, scar formation is possible, and it has a risk of donor site lymphedema. Although several donor site lymphedema cases have been reported after LNT (13,14), there have been no reports of BLE secondary to LNT. BLE can occur after axillary LNT similarly to axillary lymph node dissection, and surgeons should not perform LNT without preventive methods such as lymphatic mapping and navigation (15,16). Further, when LNT is harvested from the axilla, surgeons should be careful to watch for not only arm lymphedema but also for BLE.

A preventive approach is considered ideal both for arm lymphedema and BLE after LNT. Campisi and Boccardo et al reported the lymphatic microsurgical

preventing healing approach (LYMPHA) for primary prevention of arm and leg lymphedema after cancer treatments (17-19). LYMPHA allows primary prevention of cancer-related lymphedema and is performed via the same skin incision as cancer ablative surgery. Unfortunately, LNT was performed at another hospital in the present case, and we performed the LVA secondarily for treatment of BLE. It is ideal for surgeons who perform LNT to also incorporate LYMPHA procedures in the surgical field of LN flap harvest when a risk of donor site lymphedema is considered high.

A weakness of this report is that evaluation/diagnosis of breast lymphedema was only done based on history taking, physical examinations, and intraoperative findings because volumetry or lymph imaging studies could not be completed due to patient claustrophobia and allergic history. Lymphatic imaging studies such as lymphoscintigraphy, magnetic resonance imaging, and/or indocyanine green lymphography are essential and should be performed to evaluate lymph circulation of the breast as in evaluation of peripheral lymphedemas (20-24).

This is the first report of LNT-related BLE and its successful treatment with minimally invasive LVA. Although further investigations are needed, LVA may have potential to be a useful method for the treatment of donor site BLE after axillary LNT.

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