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MULTIPLE LYMPHATICOVENULAR ANASTOMOSES FOR LONGSTANDING FACIAL LYMPHEDEMA AFTER MULTI-SURGERY FOR HEAD-AND-NECK CANCERS

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МНОЖЕСТВЕННЫЙ ЛИМФОВЕНУЛЯРНЫЙ АНАСТОМОЗ ПРИ ДЛИТЕЛЬНОЙ ЛИМФЕДЕМЕ ЛИЦА ПОСЛЕ РЯДА ОПЕРАЦИЙ ПО ПОВОДУ РАКА ГОЛОВЫ И ШЕИ

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Treatment for long standing lymphedema in the head-and-neck region following cancer resection and radiotherapy is challenge. Multiple and multi-site lymphaticovenular anastomoses (mLVAs),established by Koshima andneeds supermicrosurgical technique, is now considered to be anessentialtreatment for limb lymphedema. mLVAs for facial lymphedema was achieved for case after resection for multiple head-and-neck cancer achieved. Preoperative fluorescent lymphography showed remaining function and localization of lymphatic channels, and a lymph vessel with a diameter of about 0.2–1.0 mm was anastomosed with a vein using supermicrosurgery. The outcome of this case suggests that LVA is applicable for treatment of lymphedema in the head-and-neck region.

Key words: *facial lymphedema, lymphaticovenular anastomosis, supermicrosurgery, lymphedema therapy, head-and-neck reconstruction, ICGIntra-operative lymphography.*

Лечение длительной лимфедемы в области головы и шеи после удаления раковой опухоли и лучевой терапии является трудной задачей. Множественный и распределенный лимфовенулярный анастомоз (mLVAs), разработанный Isao Koshima и необходимый в применении сверх-микрохирургии, рассматривается в настоящее время как основное лечение при лимфедеме конечностей. Множественный и распределенный лимфовенулярный анастомоз при лимфедеме лица был применен после резекции опухоли лица и шеи. Предоперационная флуоресцентная лимфография показала сохранившиеся функции и локализацию лимфатических каналов, а лимфатический сосуд с диаметром примерно 0.2–1.0 мм был соединен анастомозом с веной при помощи сверхмикрохирургии. Полученные результаты позволяют предположить, что лимфовенулярный анастомоз может применяться для лечения лимфедемы в области головы и шеи.

Ключевые слова: *лимфедема лица, лимфовенулярный анастомоз, сверх-микрохирургия, лечение лимфедемы, восстановления лица и шеи, лимфография.*

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INTRODUCTION

Facial lymphedema after removal of head and neck cancers is very rare, because almost all cases are temporary swelling, not edema which will not disappear like limb edema. However, there are sometimes long-standing facial edemas especially in cases with multi-surgery and irradiation for cancer recurrence. These are long-standing or permanent and aggressive edema, because all lymphnodes and lymphatic system are resected and damaged in the cervical region.

Treatment for long-standing facial edema is challenging. Standard physio-compressive therapy is difficult and not effective, because those cannot be continued for face in daytime, where is an exposing

area and each organs (lips, eyes and nose) must be open for daily life, completely different from concealing limb area.

Most important surgical treatment, classical lymphaticovenous anastomosis, was established by O'Brien [1, 2], but it was not effective because of poor technique and instruments with poor microscope in 1960–70's. Recent development of multiple and multi-site lymphaticovenular anastomoses (mLVAs) with supermicrosurgical technique was established at 1994 by the primary author [3, 4]. So far, over 2000 cases of limb edema were treated by this surgical method, and many reports on excellent results have been proved this method as the first choice of treatment for lymphedema [5, 6]. However, effectiveness of mLVAs has not yet established for facial edema with or without previous surgery. In this report, we report on successful case with facial edema treated by mLVA and following esthetic repair.

CASE REPORT

The patient was a 59-year-old man, who had previously developed five tumors in the head-and-neck region and had undergone total resection of cervical lymph nodes and radiotherapy. These procedures included radiation for laryngeal cancer 10 years ago, tumor resection and right neck dissection for hypopharyngeal cancer 8 years ago, resection of an esophageal tumor 7 years ago, resection of an oropharyngeal tumor 6 years ago and tumor resection and left neck dissection for laryngeal cancer 5 years ago.

Facial lymphedema developed after the surgical procedures and slowly aggravated. The patient was concerned that aggravation of upper eyelid edema may impair eyelid opening and that aggravation of swelling of the cheek may cause dysarthria, in addition to aesthetic deformity (Figure 1–2).

Figure 1. left side before lymphaticovenular anastomosis (LVA). Right side appearance atone year after mLVAs. Dramatic improvement before and after mLVAs

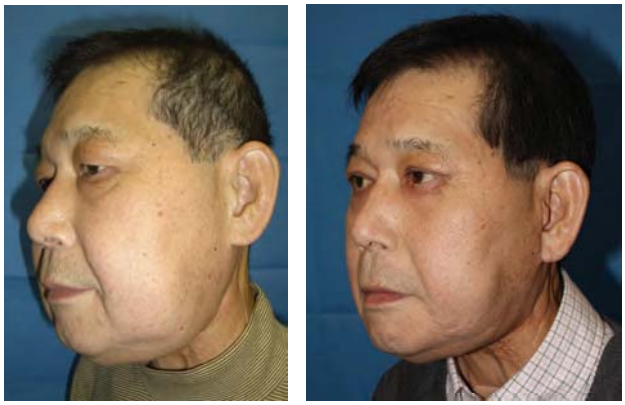

Figure 2. Facial appearance; lateral view at one year after surgery, left preope, right postope, showing marked improvement of edema

On November 12, 2008, surgery was performed under local anesthesia. Lymph vessels in the right preauricular and buccal regions were identified by intra-operative fluorescent lymphography using indocyanine green (ICG) dye for near-infrared fluorescence labelling (Ref. 7, Figure 3). Incisions of 2–3 cm in length were made in the bilateral preauricular and submandibular regions, and lymph channels and subcutaneous venules were dissected. Lymph channels were found in the right preauricular and left submandibular regions, and double LVAs were performed.

The diameters of the lymphatics in the right preauricular and left submandibular regions were 0.2 and 0.6 mm, respectively In the right preauricular, LVA had three interrupted sutures using 12/0 nylon. In the left buccal region, LVA had eight interrupted sutures using 12/0 nylon (Figure 4). Postoperatively, Lymphedema slowly remitted over 6–10 months. Edema of the bilateral upper eyelids and cheeks was markedly improved, and there has been no recurrence of cancer.

Figure 3. Intraoperative ICG lymphography using near-infrared fluorescence labeling. The lymph vessel was identified by lymphography during surgery

On October 14, 2009, Second stage repair with bilateral blephaloplasty and face lifts were carried out for tightening the flaccid facial skin. This was

performed under local anesthesia. After this surgery, there was no recurrence of facial edema or other complications (Figure 1, 2).

Figure 4. Lymphaticovenular anastomosis in the right preauricular region (right) and left submandibular region (left)

Figure 5. Memo of operative methods.Lymphaticovenular anastomosis in the right preauricular region (right) and left submandibular region (left)

DISCUSSION

Facial edema is very especially in cases with multiple resection and radiotherapy. I personally assume **Why rare, reason is** almost all patients, even if they have facial edema, would be die with cancer metastasis, Only small number of patients can salvaged with this multi-staged surgery and radiotherapy, those cannot be escape from permanent facial lymphedema. Our case was such a case.

Why mLVAs works: as in the same as limb edema, mLVAs is a curative treatment in which a new drainage pathway is prepared by artificially constructing a lymph-vein bypass [3–6]. In this patient, lymph drainage was bypassed by anastomosis of subdermal venules with congested lymphatics. Venous drainage of cervicofcial area in this case was spontaneously established through collateral venous system.

Preoperative ICG injection study: The important points in LVA are identification of a functioning or damaged lymph vessel by preoperative fluorescent lymphography using indocyanine green dye for near-infrared fluorescence labelling [7], with this technique, localization of lymphatics is differentiated and also drainage function of remaining lymphatic channels can be estimated. In this case we could estimate preoperatively the function of lymphatics was still remain and postoperative improvement.

Other surgical reconstructions: Simple aesthetic repair including blephaloplasty and face lifts are not effective for this case, because recurrence of edema would occur. There was a possibility of more worse edema after those methods, and it could not control edema. Lymph node transfer using groin lymph node or axillary lymph node might be used, but submandibular and supraclavicular lymph node cannot be used, because those were in irradiated area [8, 9].

Necessity of aesthetic repair with mLVAs: Without aesthetic repairs after mLVAs, resulting improvement of this case seemed to be little. With this additional surgery, there was no recurrence of facial edema. Based on our experience with limb edema, it was obvious that additional surgery like liposuction induces recurrence of edemr without mLVAs. It is important that LVA is essential for edema patients with esthetic facial surgery.

Future applications of mLAVs for facial edema: the indication could be expanded for congenital facial edema, some longstanding edema in total face and local area such as eyelid and lip, short term eyelid edema after blepharoptosis and/or face lift surgery. In future, treatments for lymphedema with aging will be popular in extremities and face would be popularize. Physio-compression therapy is effective for mild cases in limb edema, but for severe cases it does not work. mLVAs is indicated for cases with cases long-standing and resisting physical therapy.

Next step for severe lymphedema: This case showed excellent improvement with mLVAs and also combination with aesthetic surgery. For severe lymphedema resisted mLVAs, limp channel transfer with normal drainage function is the new option for lymphedema after lymph node dissection [8–11].

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