Reconstruction of Wide-apart Double Defect Using a Branch-based Chimeric Anterolateral Thigh Flap

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Summary: Wide-apart double defect in head and neck region is rare and difficult to reconstruct at one time. Double free flaps are normally used for this scenario and often tedious and technically complicated. This study presented a technique using branch-based anterolateral thigh free flap to simultaneously reconstruct the 2 defects separated wide apart. The concept, indications, surgical technique, and anatomical variations are discussed. Branch-based anterolateral thigh flap is a safe technique and the dissection will be easy when the oblique branch is present. (Plast Reconstr Surg Glob Open 2014;2:e96; doi: 10.1097/GOX.0000000000000014; Published online 14 January 2014)

Wide-apart double defect presenting 2 defects separated a long distance after tumor ablation in head and neck region is rare and difficult to reconstruct. Usually, 2 free flaps are needed to repair the separate defects. This procedure is often complicated, time-consuming, and occupying much medical resources. A chimeric flap providing 2 flap islands combined to a common mother source vessel might be a good option for this scenario. However, regular perforator-based chimeric flap cannot harvest 2 skin paddles with wide rotational arc to reconstruct 2 defects wide apart because of the limitation of nearby perforators. In the present study, we developed a technique using branch-based chimeric anterolateral thigh (ALT) flap to reconstruct the wide-apart double defect. This flap utilizes the descending and oblique branches dividing from the lateral circumflex femoral artery (LCFA) as its pedicle. The 2 skin islands can be separated widely and mounted conveniently.

PATIENTS AND METHODS

Subjects
A 23-year-old man presented with a nasal mass and underwent endoscopic resection. Postoperative pathological examination reported adenocystic carcinoma. He was referred to SUN Yat-Sen Cancer Center (Guangzhou, China) with an orbital mass and upper cervical lymph nodes 2 years later. Computed tomography showed that the paraorbital and upper cervical skin were invaded. The 2 involved skin paddles were not continuous. A positron emission tomography scan did not show any distant metastatic lesions. Surgery was done to remove the 2 masses and to reconstruct the double defects using a branch-based chimeric ALT flap.

Surgical Technique
Wide excision was done to remove paraorbital and upper cervical mass with the preservation of the eyeball and lower eyelid (Fig. 1). Frozen section ap-
proved clear surgical margins. The 2 defects were separated by 11 cm width of normal skin. A branch-based chimeric ALT flap was designed. Surgical dissection showed that skin perforators come from descending branch and oblique branch of LCFA, respectively (Fig. 2). Two skin paddles based on the 2 branches were designed and harvested (Fig. 3).

The institutional review board of SUN Yat-Sen University Cancer Center approved our work. The present study strictly abides by the Declaration of Helsinki.

RESULTS

The cervical and suborbital defects were reconstructed simultaneously using this branch-based chimeric ALT flap. The double flaps survived postoperatively (Fig. 4).

DISCUSSION

The concept of chimeric flap was developed from perforator flap and first introduced by Hallock in 1991. It refers to a combined flap that each flap has its own independent blood vessel coming from one common mother source vessel. In terms of source vessels, chimeric flap can be classified into 2 main types: perforator-based and branch-based. For chimeric ALT flap, the former type uses the perforators from the descending branch of LCFA as the source vessel and the latter uses the main branch dividing from the LCFA. The main difference between the 2 types of chimeric ALT flap is the rotational freedom of each flap in reconstruction. Because most of the combined defects after head and neck surgery are adjacent or nearby like through-and-through cheek defect and combined oral defects with mucosa, skin, soft tissue, and mandible involved simultaneously, perforator-based chimeric ALT flap can have better reconstructive result. In this article, we reported a unique case with a wide-apart double defect in head and neck reconstructed using a branch-based chimeric ALT flap that provided 2 skin paddles with wide rotational freedom.

Few branch-based chimeric ALT flaps were reported in the reconstruction of head and neck defects. Part of the reason relies on the variation of the anatomy of LCFA. Generally, LCFA gives off 3 main
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branch are in the same surgical plane. Branch-based chimeric ALT flap using these 2 branches are easy to dissect and harvest. However, only about 30% of cases have oblique branch. So, when branch-based chimeric ALT flaps are needed, the anatomy of transversal branch should be known and reserved for dissection. It is better to know the anatomy of LCFA before operation. Ultrasound or contrast computed tomography scan are good examinations and could provide information of the perforators and branches, which can benefit the surgical designing preoperatively. Fabricated chimeric ALT flap using distal end of descending branch to anastomose another flap is another option when oblique branch is missing.

CONCLUSIONS

Branch-based chimeric ALT flap can be safely used to reconstruct wide-apart double defects in head and neck region. If oblique branch of the LCFA is present, this chimeric ALT flap is easy to harvest and dissect.

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PATIENT CONSENT

The patient provided written consent for the use of his image.

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