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Case Series

The Anterolateral Thigh Flap for Hemiglossectomy Defect

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Abstract

Since Song, et al. introduced the Anterolateral Thigh Flap (ALTF) in 1984, the ALTF has gained popularity for reconstruction for head and neck defects. Thirteen consecutive patients with carcinoma of the tongue underwent surgical resection and reconstruction with the ALTF. There was only one complete flap failure, the resultant flap success rate is 92%. Preliminary assessment of recovering tongue function was acceptable and donor site complications were minimal. Therefore, we believe that the ALTF is a reliable flap for hemiglossectomy defect reconstruction.

Introduction

Tongue cancer is the most common cancer of the oral cavity. Surgery is the main treatment modality for this neoplasm. With small and superficial defects, resection surgeries do not affect the function of the tongue. However, if the large lesions invade deeply, the procedures will leave large defects that require reconstruction to restore the functions of the tongue, the most important of which are speech and deglutition.

Tongue reconstruction objectives include not only the recovery of tongue volume, but also the movement of the tongue. Currently, free flap is the ideal choice for tongue reconstruction. The Radial Forearm Flap (RFF) and Anterolateral Thigh Flap (ALTF) are the two most widely used flaps. RFF was introduced in 1981 and has gained popularity for reconstruction the oral cavity. This flap shows several advantages, but it also has disadvantages concerning the scar of donor site [1]. The ALTF is now widely used for reconstruction in Asia; this flap has some significant advantages for reconstruction of head and neck. It can be raised as a subcutaneous flap, a fasciocutaneous flap or a myocutaneous flap and can resurface large defects in head and neck. In addition, it is pliable and suitable for three dimensional defects of the tongue and the floor of the mouth. Another advantage is that it has a large and long vascular pedicle; donor site can be closed primarily and functional loss of donor site is minimal.

Patients and Methods

From March 2018 to December 2018 at the 5th Surgical Department of Ho Chi Minh City Oncology Hospital, 13 consecutive patients with squamous cell carcinoma of the tongue requiring hemiglossectomy underwent resection and reconstruction with ALTF. The histologic type of all tumors were squamous cell carcinoma. The research method is a case series report. The function of postoperative tongue is evaluated by three doctors Tables 1,2.

	Never understandable; may use written communication
1	Difficult to understand
2	Usually understandable; face-to-face contact necessary
3	Understandable most of the time; occasional repetition necessary
4	Always understandable

Table 1: Understandability of speech [2].

Level	Description
1	Nothing by mouth
2	Tube dependent with minimal attempts of food or liquid
3	Tube dependent with consistent oral intake of food or liquid
4	Total oral diet of a single consistency
5	Total oral diet with multiple consistencies, but requiring special preparation or compensations
6	Total oral diet with multiple consistencies without special preparation, but with specific food limitations
7	Total oral diet with no restrictions

Table 2: Functional Oral Intake Score items [3].

Results

We have successfully transferred flap in 12 cases; There is one case of total necrosis of the flap. We take prophylactic tracheostomy for one case, because the tumor invades a part of the base of the tongue. The average time for harvesting the flap is 120 minutes. The total surgery time is 5 - 6hours. Thigh wounds heal after 14 days and patients can walk normally. All patients ate semi-liquid food after 2 weeks. After 1 month, 10 patients achieved 6/7 swallowing function score, and 3 patients achieved 7/7. At 1 month after surgery, 9 patients reached 3/4 speech intelligibility points and 4 patients reached 4/4. There are 4 bulky flaps to operate for reducing volume. Adjuvant radiotherapy is indicated for 8 patients after surgery Table 3.

	Age	Gender	Pathological staging	Size of defects
1	39	male	pT3N2b	5 x 8 cm
2	41	male	pT2N2b	5 x 8 cm
3	32	male	pT2N0	4 x 8 cm
4	58	male	pT2N0	4 x 8 cm
5	58	male	pT3N2b	4 x 8 cm
6	52	male	pT2N2b	4,5 x 8 cm
7	49	male	pT2N1	4 x 8 cm
8	59	male	pT2N1	5 x 8 cm
9	55	male	pT3N0	4 x 8 cm
10	19	male	PT4N1	6 x 10 cm
11	63	male	pT2N0	4 x 8 cm
12	50	Female	pT2N0	4 x 8 cm
13	58	Male	pT2N0	5 x 8 cm

Table 3: Characteristics of patients.

Discussion

The main goal of reconstructing tongue defects is to restore the functions of the tongue, which include the function of speech and swallowing. A small defect of the tongue can be primarily closed, but for medium and large defects, it is ideal to use a free flap. Previous studies showed that speech intelligibility is dependent on the mobility of the remaining normal tongue, and that swallowing capacity has a strong relationship to the volume of the reconstructed tongue [4-7].

We have four patients which have a thick flap that affect the patient's ability to swallow. Radial forearm flap is very thin and pliable for the hemiglossectomy defect [3,4]. ALTF has been often thicker, particularly in women; less pliable and more-hairy in men. Primary thinning of the flap is always challenging and a secondary procedure is probably safer unless the surgeon is experienced [4]. Among many published studies on thinning ALTF; in which Yang reported 18 cases of thinning flap, 17 cases successfully done, there was only one case of necrosis at the edge of the flap [8,9]. According to Sharabi, the risk of flap necrosis also increased when thinning flap [10] (Figure 1).

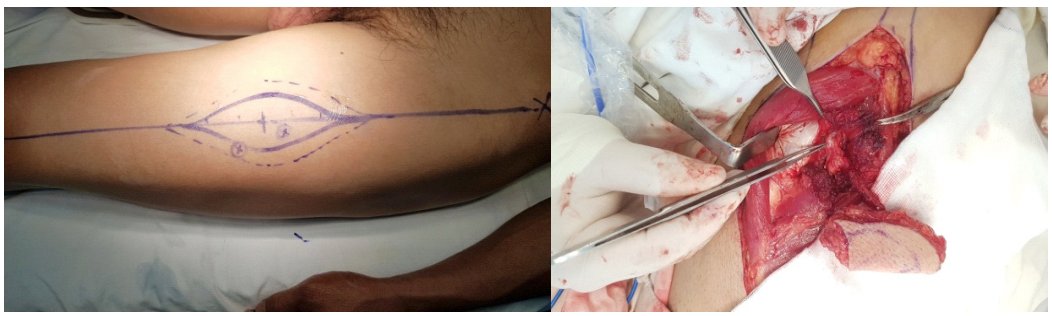

Figure 1: Designing and harvesting the flap.

The advantage of the ALTF is minimal morbidity in donor site. In most cases, donor site can close primarily with a hidden scar. The period of thigh scar healing is about 2 weeks, and the effect on the motor function of the knee is negligible, according to Kuo [11]. All of our patients have no complaints about the limited knee movement.

The limitation of ALTF is the variation in the origin and course of supplying perforators which arise from the descending branch of the lateral circumflex femoral artery. However, according to Yu, the handheld ultrasound can help locate these perforator branches relatively and design flaps based on them [12]. Another difficulty of this problem is to remove the flap from the very small perforator branches toward the lateral circumflex femoral artery, which requires meticulousness and the uses of the loupes to avoid injury to the pedicle. The descending branch of the lateral circumflex femoral artery gives off either musculocutaneous or septocutaneous perforator vessels, according to author Fu Chan Wei, 87% of musculocutaneous and 13% septocutaneous perforator vessels; With musculocutaneous perforators, the process of harvesting the flap will be more difficult [13]. In this study, we encountered 1 case of septocutaneous perforator vessels and 12 cases of musculocutaneous. Although there is a variation of anatomy perforator vessels, once the surgeon has mastered, the success rate of flap is high; According to author Fu Chang Wei, the success rate is 95% of 672 cases [12]. In our study, the success rate is 92% (Figure 2).

Figure 2: Four week's post-operation.

Conclusion

The study results show that the ALTF is a reliable flap in reconstruction of tongue defects. Its advantage is minimum of donor site morbidity; ALTF is usually thicker with hemiglossectomy defect. The variations of perforator vessels are always a challenge for the reconstructive surgeons.

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