CLINICAL STUDY

FREE TENSOR FASCIA LATA MYOCUTANEOUS FLAP AS AN ALTERNATIVE TO FREE SUPERTHIN ANTEROLATERAL THIGH FLAP IN TONGUE RECONSTRUCTION

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SUMMARY

Background: Tongue plays an important role in performing speech and swallowing functions. In this study, the clinical results of patients who underwent tongue reconstruction using a free tensor fascia lata (TFL) myocutaneous flap after changing the surgical plan during surgery in patients who were not suitable for a free anterolateral thigh flap (ALT) were shared.

Patients and Methods: Between March 2024 and March 2025, patients who underwent partial or total glossectomy and defect reconstruction with a free TFL myocutaneous flap were included in the study. Demographic data, complications, revision surgeries, and follow-up periods were analyzed retrospectively.

Results: One patient underwent total glossectomy, while three patients underwent hemiglossectomy followed by reconstruction. All flaps were viable, and no necrosis was observed. The mean follow-up period was 8±2.1 months. One patient died due to gastrostomy complications. The other 3 patients can consume all soft foods. Approximately two weeks after surgery, patients no longer required written communication, and their speech became more intelligible after the first month as swelling subsided.

Conclusion: The free TFL myocutaneous flap is an alternative to the ALT flap in tongue reconstruction, which can be thinned after dissection and has a constant anatomical structure.

Keywords: Tongue reconstruction, free tensor fascia lata myocutaneous flap, ALT flap

DİL REKONSTRÜKSİYONUNDA SERBEST SÜPER İNCE ANTEROLATERAL UYLUK FLEBE ALTERNATİF OLARAK SERBEST TENSOR FASYA LATA MİYOKUTANÖZ FLEP

ÖZET

Giriş: Dil, konuşma ve yutma fonksiyonlarının yerine getirilmesinde önemli bir rol oynamaktadır. Bu çalışmada, serbest anterolateral uyluk flebi (ALT) için uygun olmayan hastalarda ameliyat sırasında cerrahi planın değiştirilmesi sonrasında serbest tensör fasya lata (TFL) miyokutan flebi kullanılarak dil rekonstrüksiyonu yapılan hastaların klinik sonuçları paylaşıldı.

Materyal ve Metot: Mart 2024 ile Mart 2025 tarihleri arasında parsiyel veya total glossektomi ve serbest TFL miyokutanöz flebi ile defekt rekonstrüksiyonu yapılan hastalar çalışmaya dahil edildi. Demografik veriler, komplikasyonlar, revizyon cerrahileri ve takip süreleri retrospektif olarak analiz edildi.

Bulgular: Bir hastaya total glossektomi, üç hastaya ise hemiglossektomi ve ardından rekonstrüksiyon uygulandı. Tüm flepler viable olup nekroz gözlenmedi. Ortalama takip süresi 8±2,1 ay idi. Bir hasta gastrostomi komplikasyonları nedeniyle ex oldu. Diğer 3 hasta tüm yumuşak gıdaları tüketebilmektedir. Ameliyattan yaklaşık iki hafta sonra, hastalar artık yazılı iletişime ihtiyaç duymadı ve birinci aydan sonra şişlik azaldıkça konuşmaları daha anlaşılır hale geldi.

Sonuç: Serbest TFL miyokutanöz flebi, dil rekonstrüksiyonunda, diseksiyon sonrası inceltilebilmesi ve güvenilir bir anatomik yapıya sahip olması nedeniyle ALT flebe bir alternatiftir.

Anahtar Sözcükler: Dil rekonstrüksiyonu, serbest tensör fasya lata miyokutanöz flep, ALT flep

INTRODUCTION

Tongue is one of the most important organs for speech and deglutition. It is responsible for the movement of food in the mouth, advancing it towards the back, making it easier to swallow secretions and phonation of the voice. The life standards of patients after partial or total glossectomy are seriously negatively affected. These functional losses reveal the importance of tongue reconstruction after hemiglossectomy and total glossectomy. Tongue reconstruction techniques range from pedicled island flaps to free flaps such as submental artery island flap, free radial forearm flap (RFF), gracilis flap, and anterolateral thigh (ALT) flap.

The points to be considered during tongue reconstruction are that the flap should be easy to inset, the pedicle should be long enough to extend to the neck. Also, it should be thick enough to fit in the mouth and should not be

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severely atrophied in the late period. Since the flap is markedly edematous in the early period, it would be appropriate to perform a tracheotomy to ensure airway safety or to intubate the patient nasally and follow-up in intensive care unit. Although RFF is often preferred in tongue reconstruction because of its thinness and easy dissection, the sacrifice of the radial artery, one of the main vascular structures, is an important disadvantage.[1] The free gracilis muscle flap produces adequate bulge, but if nerve anastomosis is not performed, it atrophies and does not produce sufficient volume in the late period.[2,3] If the free ALT flap is dissected in the subfascial plane, it is very difficult to fit the flap into the mouth and make the inset because it is very thick, especially nowadays when obesity is increasing. However, if the ALT flap is dissected in the superthin plane, the flap thickness is significantly reduced and thus the flap can fit into the mouth and inset becomes easier.[4] Therefore, we prefer free superthin ALT flap in partial and total tongue reconstruction in our clinic. The question is whether superthin ALT solves all problems or whether an alternative flap should always be kept in mind during surgery. Several problems experienced during ALT flap dissection require a change in the surgical plan and direct the surgeon to another flap dissection. These include the pedicle appearing too weak or inadequate during flap dissection, or the strong perforator being too close to the edge of the flap, or damage to the pedicle during flap dissection. Patients are informed about these situations preoperatively, but switching to another donor site is both time consuming and sometimes not easily tolerated by patients. In this case, a free TFL myocutaneous flap can be considered through the existing incision.

The myocutaneous TFL flap is a free flap that can be preferred in head and neck reconstruction because it is a chimeric flap containing both muscle and skin, has sufficient pedicle length, and has reliable anatomy.[5] The pedicle of the TFL flap is the ascending branch of the lateral circumflex femoral artery and shares the same main vascular structure as the ALT flap. Therefore, during ALT flap dissection, if there is a risk of circulatory impairment due to pedicle injury, insufficient pedicle caliber, or the pedicle entering the flap too close to the flap margin, TFL flap dissection can be performed using the same incision.

In this study, we aimed to share the surgical results of patients who underwent tongue reconstruction with free myocutaneous TFL flap by changing the perioperative surgical plan in patients who were planning to undergo tongue reconstruction with free superthin ALT flap.

MATERIAL and METHODS

Between March 2024 and March 2025, patients who underwent partial or total glossectomy and defect reconstruction with a free TFL myocutaneous flap were included in this case series. This research was conducted per the Declaration of Helsinki guidelines. Local ethics committee approval has been obtained for the study (Decision No. 2405, Research No. 2393). All the patients have provided written informed consent for the surgery and photographs. Demographic data, complications, revision surgeries, and follow-up periods were analyzed retrospectively.

Surgical Technique

Under general anesthesia, the otolaryngology team started glossectomy and bilateral neck dissection while the plastic surgery team started free superthin ALT flap dissection (Figure 1). Preoperative marking was performed as described by Wei.[6] However, due to insufficient perforator calibration, the major perforator being close to the flap margin, or suspicious damage to the perforator during dissection, the incision was extended superiorly and a TFL myocutaneous flap was designed. The skin flap is redrawn over the TFL muscle to the width of the defect and the ascending branch of the LCFA is exposed. 2 cm diameter muscle cuff is preserved in the area where the pedicle enters the muscle and dissection is performed. The pedicle dissection is completed by including the skin and subcutaneous tissue in the subfascial plane and about 2 cm muscle mass at the central. A pedicle length of approximately 6-10 cm is obtained, which is sufficient to extend from the floor of the mouth to the neck. Flap needs to be thinned for proper inset. Since the pedicle is exposed, it is relatively easy to thin the skin flap at this stage. The subcutaneous tissue is thinned by meticulous dissection to protect the perforators entering to the flap and a central

muscle cuff is preserved (Figure 2). Thus, a flap that can fit into the mouth is obtained. After glossectomy, neck dissection and recipient vessel dissection by the otolaryngology team, the existing defect is measured again, and the flap is inserted into the defect area (Figure 3-4). Facial artery-vein, superior thyroidal artery-vein and external juguler vein are used as recipient vessels.

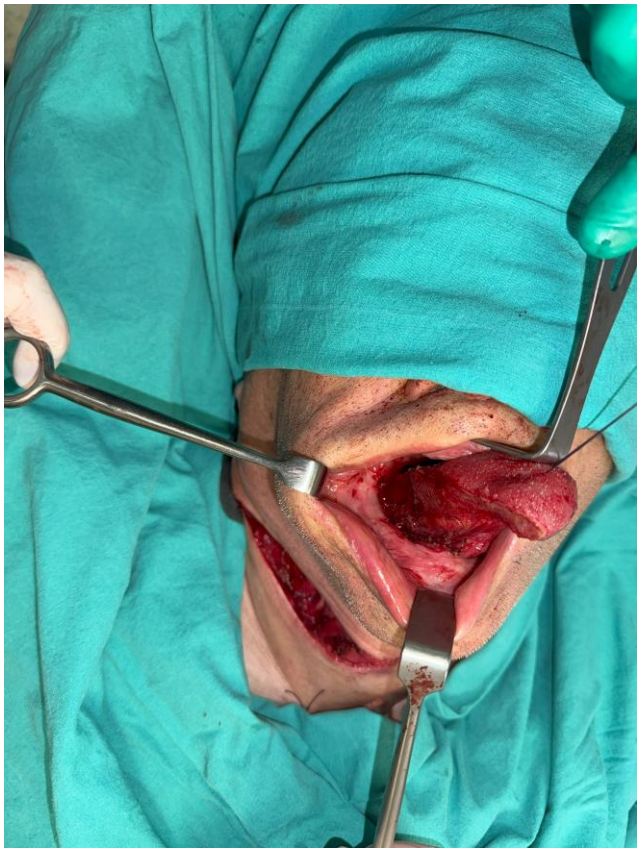

Figure 1: *72-year-old male patient with squamous cell carcinoma undergoing right hemiglossectomy and view of the defect.*

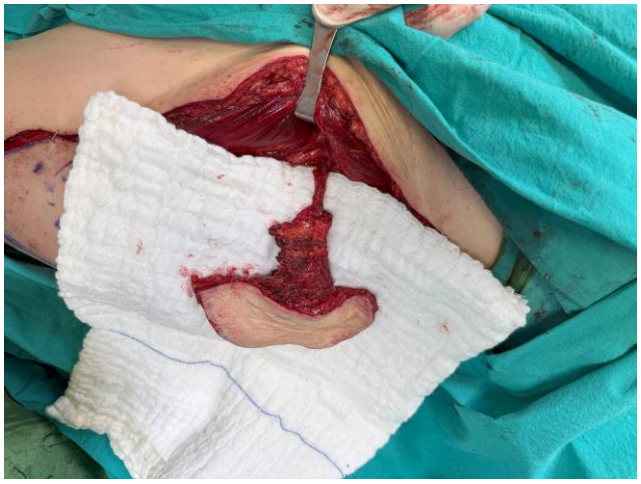

Figure 2: *Tensor fascia lata myocutaneous flap dissection.*

Figure 3: *View after flap insertion and anastomosis.*

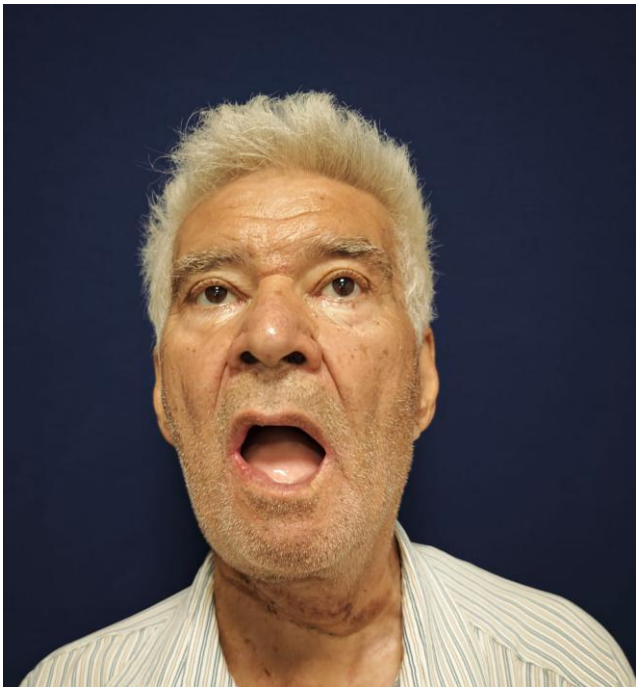

Figure 4: *Post-operative 1st month view.*

RESULTS

The study included 4 patients, and 3 patients were female, and 1 patient was male. The mean age of the patients was 71 years. One patient underwent total glossectomy, while three patients underwent hemiglossectomy followed by reconstruction. The mean follow-up period was 8±2.1 months. All flaps were viable, and no partial or total necrosis was observed. In one patient who underwent hemiglossectomy, wound dehiscence was observed in the anterior third of the tongue after 7th day of the surgery.

Dehiscence area was debrided and repaired primarily. Oral intake was stopped for 3 days During this process, feeding via nasogastric tube was continued. The patient who underwent total glossectomy was monitored in the intensive care unit for 1 month during the postoperative period. Antibiotic therapy was given, and close monitoring was performed following the development of sepsis after gastrostomy. However, the patient died due to gastrostomy complications. The other 3 patients can consume all soft foods (Video 1). Approximately two weeks after surgery, patients no longer required written communication, and their speech became more intelligible after the first month as swelling subsided. Tongue reconstruction with TFL flap not only prevented weight loss but also significantly improved patients' quality of life by restoring their speech.

Video 1: Video of the patient drinking water in the first month after surgery.

DISCUSSION

Tongue reconstruction is a challenging procedure because of its location and difficulties in the follow-up after the surgery. Reconstruction options vary and are based on the surgeon's experience and the patient's comorbidities. In an older patient with many comorbidities, local flaps or skin grafts should be considered in the first choice, whereas in younger patients with fewer comorbidities, reconstruction options with free flaps should be considered. There are other factors to consider in the decision for reconstruction options besides age and comorbidities.

The thickness of the flap is important when using free flaps in tongue reconstruction. Flap thickness complicates flap insetting, leads to the need for debulking in the later period, causing the patient to undergo a second surgical procedure, and prolongs the hospitalization period due to edema and filling of the oral cavity. Although the RFF is subfascial, it is a good option in terms of thickness for reconstruction because the forearm skin and subcutaneous tissue are thin. However, RFF cannot be used if there is no vascular continuity between the ulnar and radial arteries in the hand. In addition, sacrifice of a major artery to extremity is an important disadvantage of this flap. In our study, reconstruction was performed using a TFL flap, and both the muscle and skin flaps were thinned to facilitate flap insetting. The thickness of the skin flap varies with body mass index, but in thin patients, this thinning may not even be necessary.

In tongue reconstruction with thin profunda femoral artery perforator flap by Heredero et al., a thinner flap was obtained by flap dissection over the superficial fascia, necrosis due to vasospasm was observed in 1 patient and the flap survived in 9 patients.[7] Another free flap option in tongue reconstruction is the thin superficial epigastric artery perforator flap developed by Wang and colleagues.[8] No flap necrosis was observed in any of the 7 patients in the study and no problems with speech or swallowing functions were observed. As seen in the literature, the focus in tongue reconstruction is on flap thickness, and flaps that are much thicker in the subfascial plane are dissected in the superficial plane to make them more suitable. In our study, after completing the flap dissection in the subfascial plane and including a 2 cm muscle mass, the flap was thinned immediately above the superficial fascial plane to make it suitable for tongue reconstruction.

Wang et all. compared the functional outcomes of patients who underwent tongue reconstruction using the ALT and radial forearm flaps.[9] They found that patients who underwent tongue reconstruction using the ALT flap had better speech ability and fewer complications, and that the ALT flap was more effective. In a study conducted by Cai and colleagues, patients who underwent tongue reconstruction with RFF and ALT flaps were compared.[10] In this study, fewer complications were observed in patients who underwent ALT flap surgery, and it was stated that the ALT flap volume was suitable for tongue reconstruction. In a study conducted by Lu and colleagues, no functionally significant results were found between the two groups in patients who underwent tongue reconstruction with ALT and RFF.[11] This shows that the ALT flap is as effective as the RFF in tongue reconstruction. At our department, we use the superthin ALT flap for tongue reconstruction,

and when the ALT flap is not suitable, we prefer the TFL myocutaneous flap.

Virgilio and colleagues investigated the effects of reconstruction on the quality of life of patients who underwent tongue reconstruction using a vastus lateralis myofascial free flap.[12] In this study, no necrosis was observed, and positive effects on quality of life were demonstrated. Adrian et al. used a chimeric medial sural artery perforator flap for partial tongue reconstruction.[13] All flaps survived and were not observed to have necrosis or other complications during follow-up. Patients were able to feed orally, and no significant speech impairment was observed. In the patients included in our study, there was no need for written communication after two weeks, and after the first month, it became easier to understand as the swelling subsided. This shows that the reconstruction was effective and had a significant positive impact on the patients' quality of life.

The TFL flap is a good option for head and neck reconstruction due to its reliable anatomy, the fact that it can be dissected as a chimeric flap, and the relatively short duration of its dissection.[5] The adequate length of the pedicle allows for easy anastomosis to the numerous recipient vessels located in the neck and face region. The ability to thin the skin flap and reduce muscle thickness with appropriate dissection are other advantages of the TFL flap. In the patients included in our study, no complications were observed during flap dissection, insertion, and anastomosis, and no partial or total necrosis was observed. Anastomosis could be performed directly to the recipient vessels, eliminating the need for a vein graft. This demonstrates that the pedicle length was sufficient and that the flap was anatomically reliable. The pedicle of the TFL flap is the ascending branch of the lateral circumflex artery, while the ALT flap is the descending branch of the same pedicle. This allows for interchangeability between them in case of problems that may arise during dissection.

Although studies in literature and our clinical experience indicate that significant positive results have been achieved in terms of quality of life and function in patients who have undergone tongue reconstruction, some studies present different results. Shabrawi and colleagues investigated functional and survival differences between patients who underwent tongue reconstruction with a RFF and those who did not and found no statistically significant differences between the two groups.[14] However, the study indicates that resection was performed with safer margins in patients who underwent reconstruction with a flap, resulting in better surgical margin safety and a lower need for adjuvant treatment.

Pectoralis major myocutaneous flap, nasolabial flap, submental artery flap and infrahyoid flap can be used for defect reconstruction in patients with comorbidities where free flap is not appropriate or in clinics without free flap experience or team.[15-18] Local flaps play a very important role in tongue reconstruction, and they can be applied in patients who are not suitable for free flaps to achieve a successful reconstruction. Local flap procedures can sometimes be challenging. These challenges include neck dissection incisions, pre-existing scars, or the presence of a tumor that has spread to or is located near the flap donor site, as well as previous surgeries. In such cases, a free flap is required for reconstruction, even if the patient has comorbidities.

The limitations of our study are its retrospective nature and the small number of patients. Also, no comparison was made with other free flap options in terms of aesthetics and functionality. Among the reasons for this is that the ALT flap is our first choice for tongue reconstruction at our clinic, and we prefer the TFL flap when we encounter problems with the ALT flap. Another limitation is the short follow-up periods and the fact that the impact of the results on quality of life and functional outcomes has not been evaluated using objective parameters.

CONCLUSION

The free TFL myocutaneous flap is an alternative to the ALT flap in tongue reconstruction, which can be thinned after dissection and has a constant anatomy. Reconstruction performed after glossectomy

significantly contributes to patients' speech and feeding functions and reduces the need for written communication and percutaneous enterogastrostomy. The role of the TFL flap in tongue reconstruction can be better evaluated with large patient series in which speech and swallowing are assessed.

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Disclosure

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