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CASE REPORT

CLINICAL OUTCOMES OF BUCCAL FAT PAD FLAP RECONSTRUCTION FOR POSTOPERATIVE DEFECTS IN ORAL CAVITY CANCER

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Abstract

Introduction. Radical surgery for locally advanced oral cavity squamous cell carcinoma often results in intraoral defects causing significant functional impairment. Immediate reconstruction is therefore essential for restoring anatomy and function. The pedicled buccal fat pad flap is a well-vascularized and technically simple method for closure of small- and medium-sized defects.
Case presentation. Two patients presented with malignant tumours involving the right buccal mucosa and the maxillary vestibular mucosa in the region corresponding to teeth 17–18. Both patients underwent radical surgical excision of the lesions with adequate oncologic margins, which resulted in postoperative soft tissue defects. Immediate reconstruction was performed in both cases using a pedicled vascularized buccal fat pad flap to restore tissue continuity. The flap was carefully mobilized and positioned to achieve complete coverage of the defects without tension. The postoperative course was uneventful in both patients. No complications such as flap necrosis, infection, or wound dehiscence were observed. Complete flap survival was achieved, with primary wound healing and satisfactory restoration of anatomical integrity and functional capacity, including preservation of oral competence and mastication.

Résumé

Résultats cliniques de la reconstruction par lambeau adipeux buccal pour les défauts postopératoires du cancer de la cavité buccale

Introduction. La chirurgie radicale du carcinome épidermoïde de la cavité buccale localement avancé entraîne souvent des pertes de substance intra-orales, provoquant un déficit fonctionnel important. Une reconstruction immédiate est donc essentielle pour restaurer l'anatomie et la fonction. Le lambeau pédiculé de la boule de Bichat est une méthode bien vascularisée et techniquement simple pour la fermeture des pertes de substance de petite et moyenne taille.
Présentation des cas. Deux patients présentaient des tumeurs malignes touchant la muqueuse buccale droite et la muqueuse vestibulaire maxillaire, au niveau des dents 17-18. Les deux patients ont bénéficié d'une exérèse chirurgicale radicale des lésions avec des marges oncologiques adéquates, entraînant des pertes de substance postopératoires. Une reconstruction immédiate a été réalisée dans les deux cas à l'aide d'un lambeau pédiculé vascularisé de la boule de Bichat afin de rétablir la continuité tissulaire. Le lambeau a été mobilisé et positionné avec précaution pour obtenir une couverture complète des pertes de substance sans

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Conclusions. The buccal fat pad flap is an effective method for the reconstruction of small- to medium-sized defects of the oral cavity. The technique is characterized by low donor-site morbidity and technical simplicity. Its use is justified by its high functional and clinical effectiveness.

Keywords: reconstruction, plastic surgery, regeneration, oral cavity, maxillofacial region.

tension. Les suites opératoires ont été simples chez les deux patients. Aucune complication telle que nécrose du lambeau, infection ou désunion de la plaie n'a été observée. La survie complète du lambeau a été obtenue, avec une cicatrisation primaire et une restauration satisfaisante de l'intégrité anatomique et de la capacité fonctionnelle, incluant la préservation de la compétence orale et de la mastication.

Conclusions. Le lambeau de boule de Bichat est une méthode efficace pour la reconstruction des pertes de substance de petite à moyenne taille de la cavité buccale. Cette technique se caractérise par une faible morbidité au niveau du site donneur et une simplicité technique. Son utilisation est justifiée par sa grande efficacité fonctionnelle et clinique.

Mots-clés: reconstruction, chirurgie plastique, régénération, cavité buccale, région maxillo-faciale.

Introduction

Locally advanced squamous cell carcinoma of the oral cavity is managed using a multimodal treatment strategy, in which radical surgical resection represents the primary and essential component. Depending on histopathological risk factors and staging characteristics, surgery is typically followed by adjuvant radiotherapy or concurrent chemoradiotherapy, in accordance with established clinical guidelines.[1] Advanced local tumour spread frequently requires combined and extended resections, often involving multiple anatomical subsites of the maxillofacial region. Such procedures may include removal of substantial soft tissue and/or osseous structures to achieve adequate oncologic margins and optimal local disease control.[2]

These procedures are frequently associated with significant functional impairments, including deficits in speech, swallowing, mastication, and respiration, as well as the development of facial deformities, all of which negatively affect patients' quality of life.[3] Therefore, immediate reconstructive surgery employing contemporary techniques of plastic and reconstructive surgery has become an essential component of comprehensive treatment in this patient population. Such interventions are aimed at restoring anatomical integrity, functional capacity of the affected structures, and facilitating optimal postoperative rehabilitation.[4]

Therefore, reconstruction of oral cavity defects remains one of the pressing challenges in contemporary maxillofacial surgery. The development of oroantral communications, defects of the hard and soft palate, the alveolar process, or postoperative tissue loss following tumor resection necessitates careful selection of a reconstructive technique that ensures reliable defect closure, rapid functional recovery, and minimal donor-site morbidity. In this context, the use of local vascularized tissues has gained particular attention as a valuable reconstructive option.

The buccal fat pad (corpus adiposum buccae), first described by Marie François Xavier Bichat, is an anatomically distinct structure with a well-developed vascular network and a relatively constant volume. Its close topographical relationship to the maxilla and palate, technical accessibility via an intraoral approach, and preservation of the vascular pedicle provide favorable conditions for its effective use as a vascularized flap. Clinical implementation of this technique began following the publication by Egyedi in 1977, which demonstrated successful closure of oroantral and oronasal defects using the buccal fat pad.[5,6]

At the same time, the question of the rational selection of this technique—depending on defect size and location, the condition of surrounding tissues, and concomitant pathology—requires further analysis. Despite a substantial number of publications, discussion continues regarding the limitations of the flap's use and the prediction of potential complications.[7-9]

Cases presentation

The first case

An 83-year-old woman presented to the Department of Head and Neck Tumours of the communal non-profit enterprise "Podilskyi Oncology Center" of the Vinnytsya Regional Council, Ukraine, with a tumour of the right buccal mucosa. The lesion was exophytic, covered with fibrin, measured 3 cm in diameter,

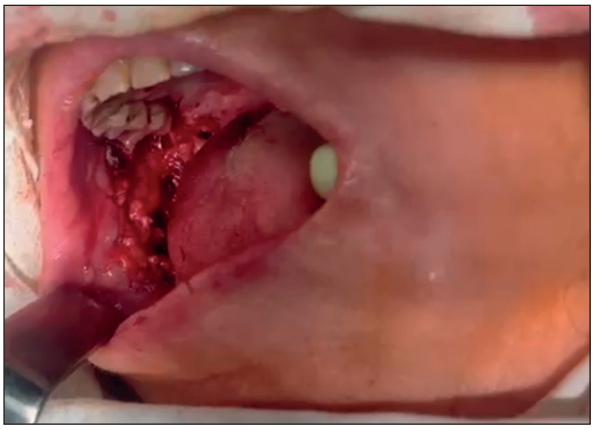


Figure. 1. Appearance of the postoperative wound of the right buccal mucosa on postoperative day 2



Figure 2. Postoperative appearance of the right buccal mucosa on day 4.

and was painless on palpation. Regional lymph nodes were not palpable. The initial management consisted of surgical excision followed by radiotherapy.

The surgical procedure was performed under general anesthesia. The tumour of the right buccal mucosa was excised with a margin of healthy tissue. After creating a mucoperiosteal access, blunt mobilization of the buccal fat pad was performed, taking care to preserve the vascular pedicle. The flap was advanced into the defect without tension and secured with interrupted sutures. The surface of the flap was left exposed to allow secondary epithelialization.

The following parameters were assessed: flap viability, time to complete epithelialization, presence of complications, and functional recovery, including speech and swallowing.

During the first 1–2 postoperative days, flap adaptation was observed. Moderate postoperative edema of the cheek and surrounding tissues was present, along with hyperemia of the mucosa surrounding the wound. The flap exhibited a yellowish color, characteristic of adipose tissue, and was securely fixed with sutures. Signs of adequate perfusion were evident, including the absence of cyanosis or necrotic areas (Figure 1).

During this period, primary vascular adaptation and stabilization of the flap microcirculation occurred.

By postoperative days 3–4, the edema gradually subsided. The flap remained viable, and its color became less intensely yellow. Granulation tissue began to form at the periphery, and vascular perfusion stabilized. Pain decreased, and swallowing and mouth-opening function improved. At this stage, a firm interface between the flap and the recipient site was established (Figure 2).

By postoperative days 8–14, active proliferation was observed, accompanied by a marked reduction in the area of exposed adipose tissue. Intense epithelialization and formation of young connective tissue were evident. By the end of the second week, the patient exhibited no functional limitations (Figure 3).



Figure 3. Postoperative appearance of the right buccal mucosa on day 10.

The second case

A 63-year-old woman presented to the Department of Head and Neck Tumours of the communal non-profit enterprise "Podilskyi Oncology Center" of the Vinnytsya Regional Council, Ukraine, with a tumour of the mucosa in the maxillary vestibule corresponding to tooth 18. The lesion appeared as an ulcer, measured 1 cm in diameter, and was painless on palpation. Regional lymph nodes were not palpable. Computed tomography revealed resorption of the alveolar bone in the region of teeth 17–18.

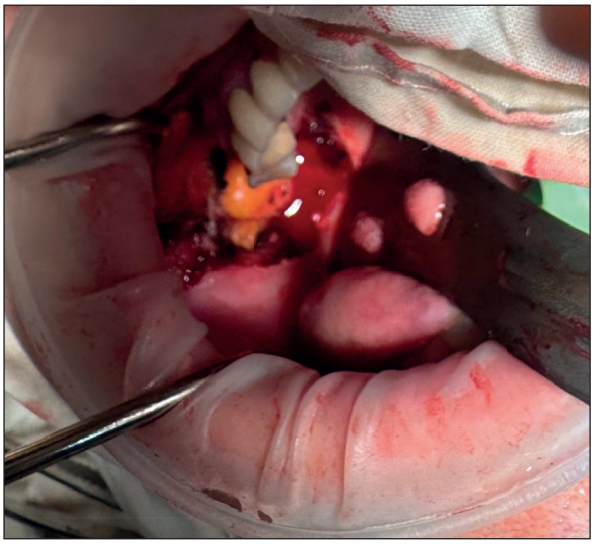


Figure 4. Postoperative appearance of the right hard palate mucosa and harvesting of the buccal fat pad flap.

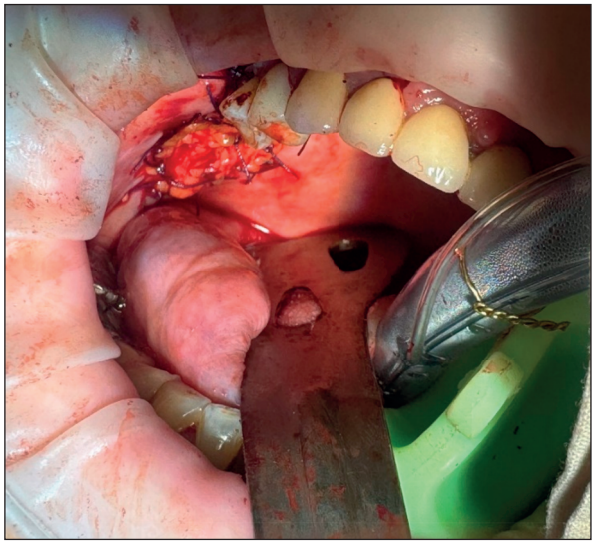


Figure 5. Postoperative appearance of the right hard palate mucosa on day 1.



Figure 6. Postoperative appearance of the right hard palate mucosa on day 5.



Figure 7. Postoperative appearance of the right hard palate mucosa on day 18.

The initial management consisted of surgical excision followed by radiotherapy. The extent of the surgical procedure included excision of the maxillary mucosal tumor with resection of the alveolar ridge, extraction of teeth 17–18, and reconstruction using a buccal fat pad flap (Figure 4).

Following reconstruction with a buccal fat pad flap, the postoperative wound was covered with a vascularized adipose flap. The flap exhibited the characteristic yellowish color, was evenly positioned within the defect, and showed no signs of ischemia or necrosis. Wound edges were well approximated, sutures were intact, and flap fixation was satisfactory. Moderate postoperative edema of the surrounding tissues and mild hyperemia were consistent with the early postoperative period. No evidence of bleeding, hematoma, or wound dehiscence was observed. Overall, the clinical course corresponded to an uncomplicated early postoperative period (Figure 5).

By postoperative days 5–7, the surface of the flap was covered with a thin fibrinous layer. Active proliferation of fibroblasts and capillaries was observed, and marginal epithelialization from the surrounding mucosa began. No complications were noted—there were no signs of necrosis or wound dehiscence. This period represents a critical phase for the potential development of partial flap necrosis in cases of excessive tissue tension (Figure 6).

By postoperative days 15–21, the flap was completely or nearly completely covered with stratified squamous epithelium. Tissue infiltration decreased, and epithelialization was completed, resulting in the formation of an elastic scar without significant deformity (Figure 7).

Thus, the mean time to complete epithelialization was 15–18 days. Functional impairments, including difficulty with mouth opening, mastication, and swallowing, resolved by postoperative days 8–12. The results obtained confirm the high clinical effectiveness of this method. The good vascularization of the buccal fat pad ensures rapid tissue integration and minimizes the risk of infectious complications. The technique does not require microsurgical skills, which significantly broadens its applicability in standard surgical settings. A limitation of the method is the relatively small tissue volume, making it less suitable for large defects (>4–5 cm). Nevertheless, for small- to medium-sized defects, the buccal fat pad flap remains the method of choice.

Discussion

The buccal fat pad flap is widely used in maxillofacial and oncologic surgery as a simple and reliable local flap for the reconstruction of small- to medium-sized oral cavity defects.[10,11] Due to its anatomical features, including a relatively constant volume and close proximity to the defect site, its mobilization does not require additional external incisions, which reduces operative time and minimizes surgical trauma.[12,13]

One of the key advantages of the buccal fat pad flap is its rich vascular supply, provided by branches of the maxillary, superficial temporal, and facial arteries, which contributes to high flap viability and rapid epithelialization of the defect surface.[14,15] The use of the buccal fat pad flap is associated with a low risk of necrosis, infectious complications, and wound dehiscence, even in patients who have undergone radiotherapy.[16]

Furthermore, harvesting the buccal fat pad flap is associated with minimal donor-site morbidity and does not result in significant functional or cosmetic deficits, making it a preferred option for reconstruction of defects in the floor of the mouth, cheek, and alveolar process.[17-19] Taken together, these advantages support the consideration of the buccal fat pad flap as an effective and safe reconstructive material in the comprehensive management of patients with oral cavity neoplasms.

Conclusions

The buccal fat pad flap is an effective method for the reconstruction of small- to medium-sized oral cavity defects. The technique is characterized by low donor-site morbidity and technical accessibility.

Its use is justified by high functional and clinical effectiveness.

Author Contributions

A.A.K. was responsible for the clinical diagnostic, diagnostic procedures, treatment decisions, performed the surgery and wrote the manuscript. S.M.S. provided diagnosis, conceptualization, methodology. V.S.K.- original draft preparation, review, editing. All authors have read and agreed to the published version of the manuscript.

Compliance with Ethics Requirements:

"The authors declares no conflict of interest regarding this article.

The authors declares that all the procedures and experiments of this study respect the ethical standards in the Helsinki Declaration of 1975, as revised in 2008(5), as well the national law. Informed consent was obtained from the patient included in the study."

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