RESEARCH PAPER

Radial Forearm Free Flap Reconstruction Of Defects In Left Segmental Mandibulectomy Of Buccal Carcinoma

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ABSTRACT

Introduction and Objectives: Buccal carcinoma is a malignancy that occurs in the oral mucosa between the cheeks and teeth. The therapy goals are to eliminate the cancer and maintaining ability to speak, eat, drink, the patient's appearance post therapy. Soft tissue reconstruction is performed to avoid contractures and trismus. Radial forearm flee flap frequently used because of its reliability, versatility, and ease of harvest. A good understanding of management and reconstruction of buccal carcinoma will improve the outcome.

Material and Methods: A 52 year old man with chief complaint of posterior left side gum canker sores for three years accompanied by intermittent pain. Physical examination revealed necrotizing reddish lumpy mass on posterior left side oral cavity. Treatment consists of left mandible partial resection, supraomohyoid neck dissection and defect closure reconstruction with radial forearm free flap. Chemotherapy and radiotherapy was done after surgery. Two year follow-up showed no recurrence. Literature search was carried out in PubMed with keywords (buccal) AND (carcinoma) AND (management) AND (surgery). Systematic review with format of population, intervention, comparison, outcome, and time frame was done.

Results: Four case reports were relevant to the topic were obtained from 64 literature search results.

Conclusion: Primary resection of the lesion and neck dissection are the main option for treating buccal carcinoma. Reconstruction with a radial forearm free flap was chosen to prevent contracture from the lesion. Chemotherapy and radiotherapy can be administered after surgery to improve the outcome without compromising the flap.

Keywords: buccal carcinoma, partial resection, reconstruction, radial forearm free flap.

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INTRODUCTION

Buccal carcinoma is a form of malignancy that occurs in the oral mucosa between the cheeks and teeth. Buccal carcinoma is included in the group of oral cavity malignancies. Data on oral cavity carcinoma in Indonesia shows that it is ranked 16th for incidence and 15th for mortality. Data in 2019 shows that the incidence of buccal carcinoma in Indonesia is 11% of the total number of oral cavity malignancy patients.[1,2,3]

The symptoms found in the initial stage are mouth ulcers that do not heal and pain if there is local tumor infiltration. Loose teeth are an indication of infiltration of the alveolar process. Buccal mucosal neoplasms can spread quickly to the surrounding area because they do not have certain anatomical structural barriers. The buccal fat and muscle layers are very easily infiltrated by carcinoma. Buccal carcinoma is often found in the advanced phase. A feeling of fullness on one side of the face as well as redness or ulceration of the skin can be found in the advanced phase.[1]

The goals of oral cavity carcinoma therapy in general are to eliminate the cancer, maintain the ability to speak, maintain the ability to eat and drink, and maintain the patient's appearance. Small and superficial tumors in T1 or T2 carcinoma of the oral cavity will generally undergo resection or radiotherapy. Generally given a combination of adjuvant radiotherapy

and postoperative chemotherapy in advanced stage tumors (T3 or T4). Postoperative chemotherapy may improve locoregional control and survivability. Smaller sized carcinomas can undergo primary closure or skin grafting, while larger lesions can undergo soft tissue reconstruction to avoid contractures and trismus.[1,4]

Buccal carcinoma has a poor prognosis. Patients generally arrive at an advanced stage and surgery is not possible. Chemotherapy is given to patients who are unresectable. The percentage of survival at 5 years ranges from 90% in stage I, 80% in stage II, 65% in stage III, and 30% in stage IV.[5]

The purpose of writing this case report is to report the management of buccal carcinoma which was carried out surgically using a wide excision approach of left buccal carcinoma, partial left mandibular resection, closing the defect in the left mandibular region with a radial forearm free flap.

There is no conflict of interest and informed consent has been obtained from the patient.

CASE REPORT

A 52 year old man was referred from a fellow dentist to the outpatient clinic with the main complaint of canker sores on the lower gums on the left side of the mouth since three years ago accompanied by intermittent pain for the last three years. The patient previously went to a general practitioner and dentist for treatment, but the canker sores did not heal. The area that has canker sores has become increasingly swollen with numbness since the one month ago. One week later a lump appeared in the canker sore area which felt like it often bled, especially when brushing your teeth. The patient has a history of smoking 1 pack per day for 10 years and has quit for the last 20 years. The patient suffers from chronic hepatitis B and has been taking the antiviral drug Kifovir regularly for 20 years.

Physical examination revealed a reddish-white lumpy mass, accompanied by necrotic tissue, and a defect in the buccal region of the posterior left side of the oral cavity (Figure 1). On physical examination of the neck, no lymph node nodules were found.

Figure 1. Buccal Tumor in Oral Cavity

The examination continues with endoscopy. The results of an endoscopic examination on January 2023 showed a tumor mass in the left buccal area with an exophytic component. The tumor appeared to extend into the buccal sulcus and gums (Figure 2).

Figure 2. Endoscopy Exploration

A multislice computerized tomography (MSCT) examination of the midface and colli with and without contrast at January 2023 revealed a heterogeneous solid mass of irregular shape, partly indistinct boundaries, lobulated in the left mandibular region with soft tissue swelling around it and extending to the left risorius muscle, suggesting malignancy. In the neck lymphatic tissue, multiple lymphadenopathy was found at levels Ia, IIa and IIb on the right and left (Figure 3).

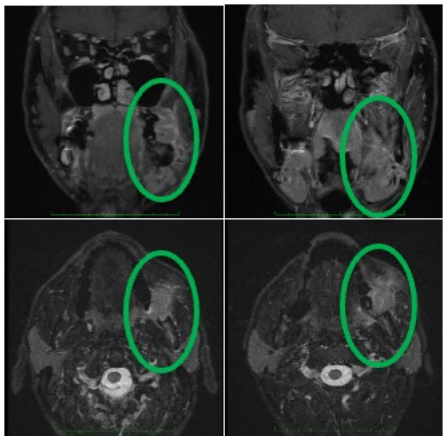


Figure 3. MSCT *Midface* and Colli with and without Contrast.

Blood tests revealed reactive serum hepatitis B antigen (HbsAg). The patient underwent an anatomical pathology examination and biopsy of the left buccal mucosa and showed high grade squamous carcinoma and glandular features with positive P16.

Based on the results of the history, physical examination and supporting examinations, the patient was diagnosed with T2N2bM0 buccal carcinoma. The patient was planned to undergo wide excision with partial resection of the left mandible and supraomohyoid neck dissection. The action then continued with closure of the left mandibular region defect with a radial forearm free flap.

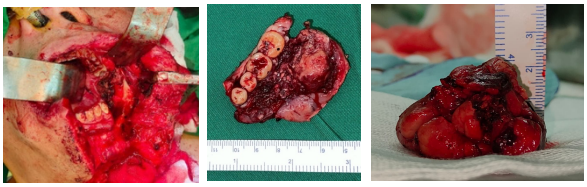
The operation began with a C- shaped incision in the left mandible with a mid lip split approach (Figure 4). The incision starts from the tip of the mastoid process, curves anteriorly about two finger widths below the body of the mandible along the skin fold of the upper neck, towards the midline of the neck to the extent of the hyoid bone. The incision is then continued caudally, dividing the skin and soft tissue of the submental region and mid-lower lip. The vertical curved incision starts from the posterior border of the sternocleidomastoid muscle. Dissection is then carried out from the posterior triangle extending to the lateral aspect of the carotid sheath.

Figure 4. The Incision Line.

Dissection is continued caudally along the carotid sheath to the digastric muscle. All soft tissue attachments to the lymphatic tissue and deeper blood vessels are separated to expose the entire inferior surface of the digastric muscle. The neck incision is then extended caudally in the midline, dividing the skin of the chin and lower lip at its full thickness. The upper skin flap of the neck dissection then elevated to the lower border of the mandible, extending from the midline of the chin to the angle of the mandible.

Division of the upper lip in the midline is continued to the lateral cortex of the mandibular symphysis. The next mucosal incision is made in the gingivobuccal sulcus. The lower cheek flap is elevated to preserve all the muscles and surrounding soft tissue. The masseter muscle was freed from the lateral cortex of the ascending ramus of the mandible to the mandibular notch using electrocautery. The mandible saw was used for mandibular resection on the lateral and medial sides (Figure 5a).

The procedure continues with a mucosal incision using electrocautery to the tumor (Figure 5b). The mylohyoid muscle is freed from the hyoid bone and the remaining soft tissue attachment is freed. Frozen section was performed from the excision results and it was found that the resection edges were free of tumor cells. The action then continues with supraomohyoid neck dissection.



(a) (b) (c)

Figure 5. (a) Post Left Buccal Resection Defect (b) The length of the excised tissue is 5 cm, (c) The width of excised tissue is 2 cm.

A radial forearm free flap was performed (Figure 6a) to close the excision defect (Figure 6b). The flap was inserted into the defect, anastomosis of the radial artery with the facial artery, and anatosmosis of the cephalic vein with the facial vein end to end (Figure 6c). The graft was fixed with Nylon 4.0 and tied over the skin graft in the antebrachii region with Silk 2.0. The post incision defect in the antebrachii region was closed with primary sutures using Vicryl 3.0 and cutis sutures with Nylon 4.0 (Figure 6b).

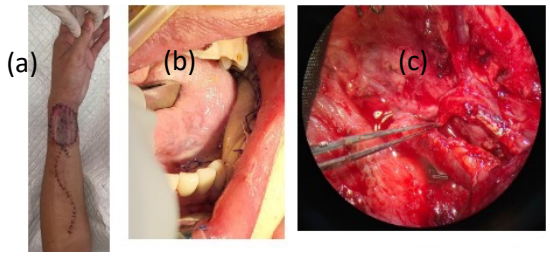


Figure 6. (a) Graft Harvest Area from Left Radial Forearm (b) Defect Closure with Radial Forearm Free Flap, (c) Facialis Vascular Anastomoses of Graft

After surgery, the patient received therapy from plastic surgery in the form of the antibiotic ceftriaxone 1 gram every 12 hours intravenously, the analgesic metamizole 1 gram every 8 hours intravenously, vitamin C 1 tablet every 12 hours, pentoxyfilin 400 mg every 8 hours, and dexamethasone 5 mg every 8 hours until the third post-operative day. The patient was treated in an inpatient unit for 12 days. The patient is positioned head up at 30° with the neck slightly extended. The patient is prohibited from bending the neck towards the chest and is prohibited from sleeping on his side so as not to put pressure on the flap pedicle. Patients are also prohibited from opening their mouths wide in order to maintain flap viability.

The patient was sent home with oral antibiotic therapy of cefixime capsules 200 mg every 12 hours orally for five days, warfarin 2 mg every 24 hours orally, vitamin C 500 mg every 24 hours orally, and the anti-pain mefenamic acid 500 mg every 8 hours orally for pain. Patients are educated to maintain oral hygiene. The patient is planned to return to the THTBKL and Plastic Surgery outpatient unit after two weeks after surgery for the first evaluation.

The patient went control to outpatient clinic after two weeks after surgery, the flap was found to be viable. The patient is planned for control one week later and is recommended to maintain oral hygiene. The patient returned for control after one week after the first control, from the anamnesis there were no complaints. Flap was evaluated adherent to its position and viable. The patient was planned for a final follow-up one week later and it was found that the graft was in position and viable.

The patient was then monitored 6 months after surgery (Figure 7 a, b). The patient can eat, drink, and communicate well. The patient then underwent 30x radiotherapy and chemotherapy using a combination of Cisplatin Paclitaxel which was planned for six cycles. The patient did not complain of pain, new wounds, or thickening until now after 2 years of follow-up (Figure 7 c).

Figure 7. (a) Follow up 6 months after surgery shows that the defect is well closed with cicatricial tissue. (b) Viable flap without signs of recurrence of cancer lesions around the buccal mucosa. (c) Post-operative follow-up 2 years

CLINICAL QUESTIONS

What is the appropriate management for T2N2M0 buccal carcinoma?

METHODS

A literature search was conducted in October 2025 in PubMed with the keywords (buccal) AND (carcinoma) AND (management) AND (surgery). There were 4 case reports that were relevant to the topic and available in full text, from a total of 64 literature search results.

RESULTS

Treatment for buccal carcinoma is carried out by wide excision of the left buccal carcinoma, partial resection of the left mandible, closing the defect in the left mandibular region with a radial forearm free flap.

DISCUSSION

Cases of buccal carcinoma in relation to oral cavity carcinoma are ranked 16th for incidence and mortality.[2] Squamous cell carcinoma is the most common type of cancer and is found in 90% of all cases of oral cavity carcinoma. More than 90% of oral cancers occur in patients over 45 years of age with a male gender tendency. The etiology of oral cavity carcinoma is multifactorial. Tobacco use, excessive alcohol consumption, insufficient consumption of vegetables and fruit, genetics, and trauma are considered risk factors for oral cavity carcinoma. The patient in this case report is a 52 year old male with smoking as a risk factor.[1,4,5]

Local status examination of the oral cavity revealed a reddish-white lumpy mass,

	Problem	*Intervention*	*Control/ Comparison*	*Outcomes*	*Time Frame*
Dave *et al.*, 2023.[6]	Buccal Carcinoma and Tongue Carcinoma	Reconstruction of the excision defect with antero lateral thigh flap (ALT)	*Radial forearm free flap*	Antero lateral thigh flap (ALT) was found effective and better at the donor site	6 months
Al-Aroomi *et al.*, 2024.[7]	Buccal Carcinoma T1-T2	Midline incision with lazy-s (MLSI) and lateral lip-splitting incision (LLSI)	*Radial forearm free flap*	MLSI provides good results on the function of the lip and the appearance of the groove of the scar. MLSI provides better outcomes with lower dysfigurity	6 months
Rachana *et al.*, 2025.[8]	Buccal Carcinoma T2-T3	*Supraclavicular flap* (SCF)	*Radial forearm free flap*	Supraclavicular flap may be an alternative to RFFF. The advantage is that the action is shorter and simpler. The difficulty is preservation of the external jugular vein which causes the SCF to necrosis more easily	10 years
Bang *et al.*, 2025.[9]	Verrucous Carcinoma	Wide excision, SOHND, right-sided infrastructural maxillectomy with right-sided marginal mandibulectomy. Reconstruction with an anterolateral thigh flap from a free fibula graft due to a large defect	*Radial forearm free flap*	Viable flaps with good cosmetics appearance	4 months

accompanied by necrotic tissue, and a defect in the buccal region on the posterior left side. The appearance of tumors originating from the mucosal surface can have different manifestations. Tumors can be ulcerated, exophytic, or endophytic. The characteristics of the lesions that appear are usually sufficient to raise suspicion for the presence of a tumor. Ulcerative lesions are usually accompanied by irregular edges and induration of the underlying soft tissue carcinoma with excessive keratin production.[5]

The results of the endoscopic examination showed a tumor mass in the left buccal area. Buccal carcinoma easily spreads around because there are no anatomical structures as a barrier to prevent it. Supporting examinations such as a CT scan on the spread of the tumor mass can show increased thickening of the fat structure known as fat stranding. Fat stranding is a non-specific description of chronic inflammation where there is increased thickening of fat tissue which is almost close to the thickness of surrounding tissue such as muscle tissue.[4,10]

The results of the clinical pathology examination revealed reactive serum hepatitis B antigen (HbsAg). Serum hepatitis testing is recommended in the treatment of cancer patients. Reactivation of hepatitis B infection can occur during the patient's chemotherapy process. The reactivation process was not related to a decrease in the number of hepatitis antibodies in the patient. 11 The patient underwent an anatomical pathology examination and showed high grade carcinoma squamous and glandular features with positive p16. p16 is a tumor suppressor protein that inhibits cyclin-dependent kinase 4A. Usually the p16 protein is not found in head and neck malignancies and appears allegedly due to gene mutations or deletions. The expression of the p16 gene is associated with the presence of human papillomavirus (HPV) infection. The prognosis for p16 positive carcinoma is better because it responds well to standard treatment.[12]

The results of MSCT of the midface and colli with and without contrast showed a heterogeneous solid mass with an irregular shape, partly indistinct boundaries, lobulated, accompanied by fat stranding around it in the left mandibular region with soft tissue swelling around it and extending to the left risorius, suggesting a malignant mass. In the neck lymphatic tissue, multiple suspected lymphadenopathy was found at levels Ia, IIa and IIb on the right and left. TNM staging developed by the 8th American Joint Committee on Cancer (AJCC) influences prognosis and treatment strategies. Staging p16 HPV positive oropharynx cancer stages classifies this patient's stage as T2N2bM0. Patients have primary tumor sizes between 2 and 4 cm. The patient had multiple bilateral enlarged regional lymph nodes measuring less than 6 cm.[13]

Treatment options for oral cavity carcinoma generally consist of surgery, radiation, chemotherapy, or a combination of these modalities. In early stage tumors (stages 1 and 2), surgery or radiotherapy can be performed. Primary resection of the lesion is the main choice for the treatment of oral cavity carcinoma. In buccal lesions, a lip split incision can be performed to expand visualization of the posterior resection and access for reconstruction.[1]

Radiotherapy can be considered as a postoperative therapy with indications of positive margins or close surgical margins (<5 mm), perineural or perivascular invasion, or advanced stage tumors (T3, T4). Side effects of radiotherapy such as xerostomia, dysgeusia, dysphagia, dental decay, or mandibular osteoradionecrosis are considered as indications for radiotherapy. Chemotherapy is one of the therapeutic modalities for oral cavity carcinoma. Chemotherapy does not have an individual role in the treatment of oral cavity carcinoma. The role of chemotherapy is as adjuvant therapy in advanced stages. Chemotherapy is known to improve locoregional control and disease free survival in patients with advanced stages. Chemotherapy with high-dose Cisplatin was found to be significant in improving loco regional control in patients at high risk of recurrence.[1,14]

In this case, adjuvant chemotherapy was performed. The indication is a tumor-free margin < 3 mm. Cisplatin is the main choice in chemotherapy for head and neck carcinoma. Cisplatin is a non-specific chemotherapy drug which functions to inhibit tumor cell replication.

Paclitaxel is a chemotherapy drug that functions as an apoptotic agent. Paclitaxel works by inhibiting the depolymerization of cell microtubule structures. The combination of these two types of chemotherapy will increase the effectiveness of chemotherapy.[1,15]

The patient underwent supraomohyoid neck dissection (SOHND). This neck dissection procedure is carried out at KGB levels I-III. Neck dissection with this technique is often used to treat squamous cell carcinoma in the oral cavity. The lymph nodes removed were those in the submental and submandibular areas (level 1), upper jugular (level 2), and mid jugular (level 3).1 The patient was flapped using the radial forearm free flap graft technique. The flap procedure functions to close the defect from tumor extirpation, thereby restoring tissue integrity, function and shape. Buccal mucosal reconstruction options that can be performed are radial forearm free flap, pedicled buccal fat pad flap, and split-thickness skin graft.

The radial forearm free flap (RFFF) is one of the most significant innovations in reconstructive microsurgery. Introduced by Yang et al. in 1981, the procedure has become the gold standard for oral and oropharyngeal reconstruction, particularly in head and neck oncology. This flap is known for its excellent survivability and ease of operation. The RFFF's anatomical basis lies in the radial artery and its branches, which reliably supply blood to the fasciocutaneous tissue. This vascular capability creates a flap with excellent characteristics suitable for complex three-dimensional reconstruction. This flap combines the characteristics of thin, flexible tissue, minimal bulking, predominantly hairless tissue, and a well-developed vascular pedicle. The long vascular pedicle measures 20 cm with an artery diameter of 3 mm. These anatomical advantages allow for the reconstruction of complex defects while maintaining good function and aesthetics. The radial forearm free flap has become the standard free flap for oral soft tissue reconstruction due to its excellent adaptability and capacity to repair large lesions. Its long, flexible vascular pedicle allows this flap to cover severe defects. Besides being easy to harvest, the radial forearm free flap provides thin, flexible, and sensitive skin. The radial forearm free flap technique was chosen in this case because the defect exceeded 5 cm in diameter. This type of flap also prevents contractures when the patient opens the mouth and has good survivability.[16,17]

The radial forearm free flap (RFFF) is often performed as part of reconstructive head and neck oncology procedures. Post-oncological resection follow-up focuses on disease-free survival (DFS) or complications that cause severe dysfunction in the graft recipient area, such as mastication or speech disorders. This is especially important in elderly patients. This group often has co-existing medical conditions, a decreased ability to tolerate the metabolic stress of surgery, and a decreased ability to heal. Another contributing factor is prolonged surgical time due to difficulties with graft harvesting or graft placement due to age-related skin deterioration. It is important to remember that it is better to maintain a shorter surgical time than to achieve a longer cosmetic result. This makes the RFFF an attractive option for reconstructive head and neck oncology surgery, especially in elderly patients. Mastering the technique of RFFF graft harvest requires meticulous attention to anatomical details and surgical technique. The procedure begins with an Allen test to ensure adequate collateral blood vessels from the ulna to the hand. This is crucial to prevent complications such as post-surgical hand ischemia.[18, 19]

The flap is elevated using a suprafascial technique. This technique provides superior results compared to the subfascial technique in terms of reducing donor site morbidity while maintaining flap survival rates. During elevation, the superficial radial nerve branches are identified and preserved. This minimizes postoperative sensory deficits while ensuring adequate tendon coverage to cover the donor site, thereby reducing the risk of tendon exposure and associated complications. 19,20 The flexibility of the RFFF allows for a wide range of reconstructive scenarios, making it crucial in head and neck surgery. Reconstruction in head and neck surgery primarily involves large oral defects, tongue reconstruction after oncological resection, pharyngeal and hypopharyngeal defects, and complex facial defects. The thinness and flexibility of this flap are advantages, as

thickness would compromise tissue function. Its thinness allows for a favorable outcome in the form of good sensory sensation after reconstruction.[18]

The procedure of taking a graft from the forearm can cause iatrogenic nerve injury. Skin grafts can also be a source of neuropathic symptoms in the donor area. The skin graft used to cover the donor area, which typically covers the surface nerves in this area, can cause nerve irritation. Several techniques are used to prevent nerve injury during surgery and prevent neuropathic pain. In addition, neurectomy and burying the nerve within the muscle or nerve root are known to reduce the risk of nerve injury. Nerve irritation can also be reduced by applying acellular dermal matrix with the skin graft.[20]

The superficial location of the sensory branch of the radial nerve is susceptible to injury during harvesting a radial forearm free flap. Damage or exposure to this sensory nerve can lead to postoperative sensory changes, manifesting as painful neuromas, paresthesias, or cold intolerance. A 13.9% incidence of paresthesia around the donor site and a 10.8% incidence of pain have been reported. The incidence of paresthesia is significantly higher in diabetic patients. The high rate of paresthesia among diabetic patients after RFFF may be a symptom related to diabetic neuropathy. Another possible cause is pressure exerted on the nerve due to contracture that occurs during wound healing after skin grafting. Wound shrinkage and graft contracture have been reported at the RFFF donor site, resulting in functional limitations.[20,21]

The radial forearm free flap has limitations and potential complications. Studies report donor site morbidity, such as partial skin graft loss (16%), tendon exposure (13%), delayed healing (22%), sensory deficits (32%), and cold intolerance (14%). Functional impairments can include decreased grip strength, decreased wrist range of motion, and aesthetic concerns at the donor site. Recent innovations in closure techniques, such as modified dagger-shaped full-thickness skin grafts, have demonstrated good results in reducing skin tension and improving cosmetic outcomes while avoiding the need for additional donor sites.[22,23]

Meta-analyses report overall success rates ranging from 92.8% to 99%, with most failures due to venous complications rather than arterial insufficiency. This flap can also be used in eyelid reconstruction, extremity defects, and composite reconstructions, demonstrating its broad versatility across a wide range of clinical challenges. Future efforts in the radial forearm free flap will focus on minimizing morbidity and maintaining the quality of reconstruction. Research into alternative closure methods, including dermal substitutes and tissue engineering approaches, aims to reduce the aesthetic and functional impact on the donor limb. Advances in preoperative imaging and surgical planning continue to optimize flap design and improve patient selection, ensuring that this reconstruction technique remains a primary choice in reconstructive microsurgery practice. Research into alternative closure methods, including dermal substitutes and tissue engineering, may contribute to reducing the aesthetic and functional impact on the donor site. Advances in preoperative imaging and surgical planning may optimize reconstruction design.. [24,25,26]

Technological advances have also contributed to the development of oncological head and neck surgery. Transoral robotic surgery (TORS) can provide better visualization than endoscopy. Oropharyngeal tumor resection with TORS allows for a wider, less invasive resection of oropharyngeal tumors, resulting in better cosmetic outcomes for patients. Improved visualization can also reduce positive tumor margins. In cases of oropharyngeal carcinoma, TORS allows for resection without a lip split. Less invasive resection also results in shorter patient hospitalizations, thereby reducing patient costs. In RFFF graft harvesting, TORS allows for harvesting without a linear incision, thereby reducing complications at the graft harvest site.[27,28,29]

Hypertension is known to be a factor that can interfere with the healing process. Increased blood pressure activates the renin-angiotensin-aldosterone system, followed by activation of TGF-β/Smad3 signaling. Other factors that can occur include increased local inflammation, extracellular matrix production, and fibrosis, as

in hypertensive heart disease. During the inflammatory phase, cellular metabolic demands increase. However, metabolite substrate levels decrease due to compression caused by interstitial hypertension. This effect can lead to tissue hypoxia. Oxygen promotes angiogenesis, collagen synthesis, growth factor production, reactive oxygen species production, and ensures the efficiency of leukocytes and fibroblasts. Screening patients for hypertension can help prevent prolonged wound healing.[21]

Locoregional recurrence (LRR) occurred in 28.3% with a median follow-up of 41 months and a 2-year DFS of 75.8%. Factors influencing LRR were neck node involvement and resection margins. Involvement of one node increased the risk of LRR by 6.8-fold compared to no node involvement. Margins <5 mm increased LRR by 2.3-fold. Margins with tumor retained increased the risk of LRR by 20.9-fold compared to margins with clear tumor. Follow-up in patients with lymph node involvement and resection margins <5 mm is important in monitoring LRR and influencing DFS.[30]

Evaluations of patients with buccal carcinoma are performed periodically. Follow-up after systemic therapy or radiotherapy is performed every 4-8 months. In these patients, a positive response to therapy is found, and a positron emission tomography (PET) scan is planned. Assessments and physical examinations are performed gradually, starting in the first year, every 1-3 months. In the second year, assessments are performed every 2-6 months. In the third year, every 4-8 months, and in the fifth year or beyond, every 12 months.[15]

CONCLUSION

A 52-year-old man with T2N2bM0 buccal carcinoma was reported. The patient presented with a chief complaint of persistent canker sores accompanied by pain. The diagnosis was based on history, physical examination, and supporting findings. Management of the patient included wide excision and partial resection of the left mandible, followed by closure of the defect with a radial forearm free flap. Treatment was continued with chemoradiation. A 2-year follow-up revealed no postoperative complications and a viable flap. The patient was able to eat, drink, and communicate well.

REFERENCE

1. Deschler DG, Erman AB. Oral cavity cancer. In: Johnson JT, Rosen CA, eds. Bailey's head & neck surgery otolaryngology, 5th ed. Pittsburgh: Lippincott Williams & Wilkins; 2014. p. 1849-75.
2. World Health Organization. Lip, oral cavity. Global Cancer Observatory, 2022. Available from: https://gco.iarc.who.int/media/globocan/factsheets/cancers/1-lip-oral-cavity-fact-sheet.pdf , Accessed March 05, 2024.
3. Setoaji IW, Priyanto W, Hardianto A. Karakteristik karsinoma sel skuamosa rongga mulut di RSUP Dr. Hasan Sadikin Bandung. Jurnal Kedokteran dan Kesehatan: Publikasi Ilmiah Fakultas Kedokteran Universitas Sriwijaya 2022; 9(1):97-102.
4. Shah J, Patel S, Singh B, Wong R. Oral cavity. In: Johnson JT, Rosen CA, eds. Bailey's head & neck surgery otolaryngology, 5th ed. Pittsburgh: Lippincott Williams & Wilkins; 2014. p. 1849-75.
5. Cohen MA, Wong RJ. Tumor of oral cavity, pharynx, and esophagus. In: Chan Y, Goddard JC, eds. K.j. lee essential otolaryngology head and neck surgery, 12th ed. New York: McGraw Hill; 2019. p. 822-3.
6. Dave A, Priyadarshini P, Wadhwani K, Laxmidhar M, Vanjarapu R. Use of super-thin anterolateral thigh flap in intra-oral reconstruction of soft tissue defects. Microsurgery 2023; 43(8):782-9.
7. Al-Aroomi M, Liang Y, Chen J, Feng Y, Xuan LP, Jiang C. Comparison of posteoperative outcomes in two lip-splitting approaches for buccal squamous cell carcinoma ablation. Head & Neck; 47(4):1239-46.
8. Rachana J, Azeem M, Sagayaraj A, Kouser M, Ujval G. Functional outcomes and quality of life following supraclavicular flap reconstruction in oral cancer surgery : a retrospective analysis. Cureus 2025; 17(5):1-12.
9. Bang K, Shenoi R, Koltre V, Jadhav K, Malikar H. Tackling oral giants : a case of verrucous carcinoma involving the buccal mucosa and maxilla. Cureus 2025; 17(3):1-12.

10. Fortin F. Fat stranding (summary). Radiopaedia, 2020. Available from: https://radiopaedia.org/articles/fat-stranding-summary-3 .Accessed March 20,2024.
11. Daia MT, Median D, Buinoiu NF, Ciocarlan M, Iancu G, Panaitescu AM, *et al*. Hepatitis b virus reactivation in oncological patients who underwent chemotherapy. filantropia clinical hospital five years' experience. Maedica 2021;16(2):184-8.
12. Chang PH, Wang HM, Kuo YC, Lee LY, Liao CJ, Kuo HC, *et al*. Circulating p16-positive and p16-negative tumor cells serve as independent prognostic indicators of survival in patients with head and neck squamous cell carcinomas. Journal of Personalized Medicine 2021;11(11):1156.
13. American Cancer Society. Oral cavity and oropharyngeal cancer stages. American Cancer Society, 2021. Available from: https://www.cancer.org/cancer/ types/oral-cavity-and-oropharyngeal-cancer/detection-diagnosis-staging/staging. html. Accessed March 20,2024.
14. Pfister DG, Spencer S, Adkins D, Andrew C, Brizel DM, Busse PM. National comprehensive cancer network clinical practice guidelines in oncology. National Comprehensive Cancer Network, 2024. Available from : https://www.nccn.org/guidelines/recently-published-guidelines. Accessed May 01, 2024.
15. Yanamoto S, Denda Y, Ota Y, Hasegawa T, Akashi M, Okura M, *et al*. Postoperative adjuvant therapy for patients with loco-regionally advanced oral squamous cell carcinoma who are at high risk of recurrence. International Journal of Oral and Maxillofacial Surgery 2020;47(1):848-53.
16. Fatani B. Radial forearm free flap for head and neck defect reconstruction : an up-to-date review of the literature. Cureus 2023; 15(3):1-10.
17. Bigcas JL, Bond J. Osteocutaneus radial forearm flap. StatPearls. 2022. Available from : https://www.ncbi.nlm.nih.gov/books/NBK564384/ . Accessed September 25, 2022.
18. Rengifo R, Lian T. Radial forearm tissue transfer. StatPearls. 2023. Available from : https://www.ncbi.nlm.nih.gov/sites/books/NBK560796/ . Accessed September 25, 2022.
19. Ki SH, park TJ, Yoon JM. Surgical outcomes of suprafacial and subfascial radial forearm free flaps in head and neck reconstruction. Arch Craniofac surg 2023; 24(3):105-10.
20. Jaquet Y, Enepekides DJ, Torgerson C, Higgins KM. Radial forearm free flap donor site morbidity ulnar-based transposition flap vs split-thickness skin graft. Arch Otolaryngol Head neck Surg 2012; 38(1):38-43.
21. Hong S. Risk factors for postoperative donor site complications in radial forearm free flaps. Medicina 2024; 60(9):1487-99.
22. kitano D, Morimatsu Y, Murai N, Osaki T, Sakakibara S. the superficial branch of the radial nerve and sensory disturbance in the radial forearm flap donor site. Regen Ther 2023; 30(24):174-9.
23. Galazka A, Stawarz K, Bienkowska-Pluta K, Paszkowska M, Misiak-Galazka M. Optimizing wound healing in radial forearm donor sites : a comparative study of ulnar-based flap and split-thickness skin grafting. Biomedicines 2025; 13(5):1131-47.
24. Kyzas P. The impact of volume and surgical throughput on outcomes in head and neck reconstruction : a systematic review. Front Oral Maxillofac Med 2022; 4(23):1-16.
25. Reyes DC, Mattery LR, Rehman U, Gohari SS, Sarwar MS, Brennan PA. Use of the radial forearm free flap in eyelid and orbit defect reconstruction : a systematic review and meta-analysis. Journal of Plastic, Reconstructive & Aesthetic Surgery 2025; 103(2025):204-17.
26. Atmodiwirjo P, Ramadan MR, Djohan M, Amanda NF, Ralena NA, Sari Ep, *et al*. Does "the more, the merroer" apply to the free flap learning curve? a ten-year retrospective review from an emerging single institution. Plast Surg (Oakv) 2025; 1(1):1-9.
27. Monroe D, Pyne JM, McLennan S, Kimmis R, yoon J, Biron VL. Characteristics and outcomes of transoral robotic surgery with free-flap reconstruction for oropharyngeal cancer : a systematic review. Jounrla of Robotic Surgery; 17(1):1287-97.
28. Shin SW, Kim H, Nam W, Kim HJ, Cha IH, Koh YW, Kim D. Robot-assisted radial forearm free flap harvesting : a propensity score-matched case-control study. Journal of Robotic Surgery 2023; 17(1) : 1429-34.
29. Tsai YC, Liu SA, Lai CS, Chen YW, Lu CT, Yen

JH, *et al*. Functional outcomes and complications of robot-assisted free flap oropharyngeal reconstruction. Annals of Plastic Surgery 2017; 78(2):76-82.

30. Riju J, George NA. Factors influencing locoregional recurrence and disease-free survival in buccal mucosal squamous cell carcinoma. Indian Journal of Surgery 2020; 82(1):57-61.