

Versatility of Radial Forearm Free Flap in Reconstruction of Buccal Defect

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Abstract

The ideal method for buccal defects reconstruction should provide good outcome of both function and appearance; our goal is to highlight the reliability of radial forearm flap in buccal reconstruction. This retrospective study was conducted from July 2013 to June 2014, 04 radial forearm flaps were used to repair the defects. We analyzed the superiority and reliability of the flap; in addition, we reviewed some related literature. All radial forearm flaps totally survived. Radial forearm flap is a reliable method for buccal defect reconstruction.

Introduction

Microvascular free-flap has been in clinical use for nearly 3 decades becoming the gold standard in oral and oropharyngeal reconstruction¹. Buccal squamous cell carcinomas are the most common malignant tumors among all buccal neoplasms. These carcinomas pose significant threat to patients' lives and severely affect their quality of life². Traditionally, the treatment strategy for buccal carcinoma is mainly surgery-based comprehensive therapy³. Extensive and complete resection of buccal mucosa tumor is a current and reliable method to improve local control rate of buccal mucosa carcinoma⁴. The objectives in the reconstruction of buccal defects after surgical resection include restoration of function and structural cosmesis⁵. The radial forearm free flap (RFFF) was first introduced by Yang et al. in 1981⁶. Nowadays RFFF is a workhorse in reconstructive head and neck surgery. It has some well-known advantages: a reliable anatomy, long pedicle length, good-size vessels, suitable thinness and relative sparsity of hair, to substitute mobile oral mucosa⁷⁻⁹. In this study, we review our experiences with use of RFFF for buccal defects in four patients. The structural and functional advantages of RFFF, including its usefulness and versatility, represented and discussed.

Materials & Methods

Between July 2013 and June 2014, 04 patients in the department of Oral & Maxillofacial Surgery, Dhaka Dental College & Hospital, Mirpur, Dhaka-1206, were treated with RFFF for buccal defects. Medical records were systematically reviewed for all 04 patients. The only exclusion criterion was inadequate information. The defects varied from the retromolar trigone to the oral commissure. In the group that underwent RFFF, the mean age was 40.75 (range 30 to 50) years, and the male-female ratio was 1:3.

In all cases, simultaneous flap elevation and recipient-site surgery were performed to shorten the total operation time. The arterial anastomosis was done by radial artery with facial artery except one which was done by radial artery with superior thyroid artery). And venous anastomosis was done by venocomitens with facial & external jugular vein except one with superior thyroid vein and external jugular vein.

All the anastomosis was end to end type. Postoperatively no clinical sign of venous congestion or arterial obstruction were seen. The doner site covered with partial thickness skin graft from thigh.

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The patients had a lower-arm splint for immobilization, and the first bandage change was performed on the fifth day postoperatively. There was no severe complication in the donor site. Postoperative flap monitoring was done clinically during the first 24 hours on hour basis and then every 4 hours for the next 2 days. Patient were kept in a normal temperature room (no air conditioned or no fan for first 5 days). Haemodynaemic status was closely monitored and tried to maintain the blood pressure within normal range postoperatively.

Result

Among four patient three patient were female and one was male (male-female ratio 1: 3). Mean age 40.75 (range 30 to 50), all female patient were house wife. Demographical character is shown in table I.

Patient	Age, years	Sex	Occupation
1	43	F	House Wife
2	30	F	House Wife
3	50	F	House Wife
4	40	M	Farmer

Among four patient three patients were suffering from squamous cell carcinoma and one suffering from deep fungal infection. All RFFFs survived completely. Table II shows disease condition of the patients.

Patient	Cause	Tumor Size (T)	Post operative Complication	Reconstruction site	Mouth opening (mm) post operative
1	SCC	T ₂	no	Check	35
2	SCC	T ₃	no	Lower Rt Check vestibule & alveolar mucosa	36
3	Deep fungal infection	T ₃	no	Rt side of the check and angle of mouth	37
4	SCC	T ₃	no	Lower rt. Leap & check	39

SCC, Squamous Cell Carcinoma.

In one patient there was a swelling in the parotid region which was due to obstruction of the duct by the flap and was decreased, and become normal after inserting a drain tube under the flap.



Fig 1: Patient with deep fungal infection in the right cheek & angle of the mouth

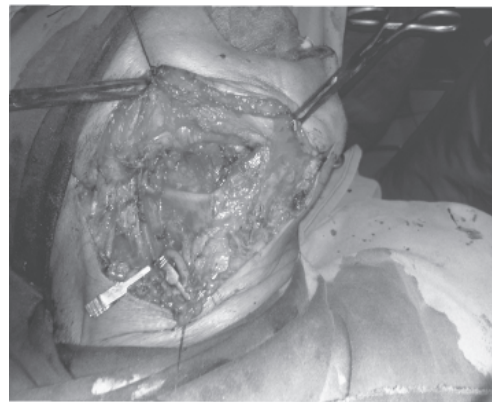


Figure 2: Exposure of the recipient vessels

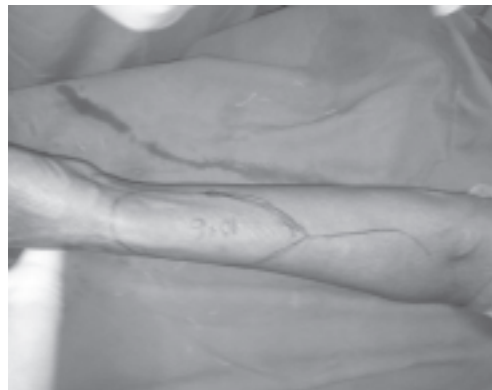


Fig 3: Marking of the required flap size

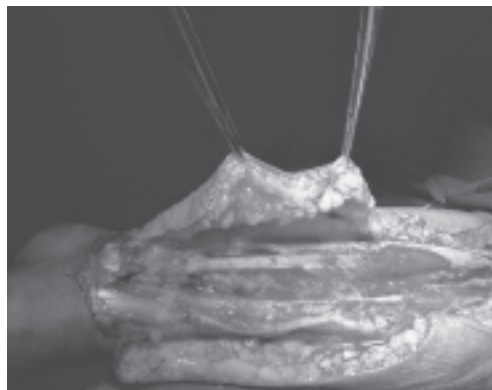


Fig 4: Raising RFFF

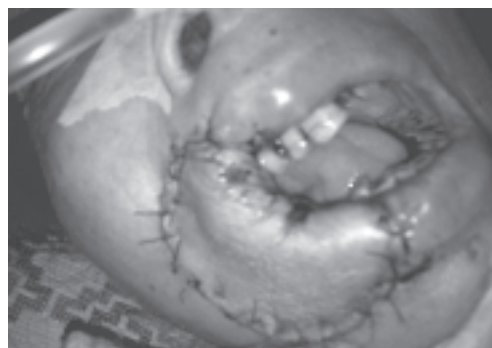


Fig 5: After reconstruction of the excised lesion with RFFF

Discussion

There are many methods suitable for repairing defects of the buccal mucosa. Sufficient open-mouth width must be obtained for satisfactory recovery, because it plays a key role in swallowing and articulation. Some local and regional flaps are suggested. The submental artery island is one of them.

The RF flap has been proven especially suitable for buccal defects. Advances in microsurgical techniques make this possible. Since Yang et al.⁶ first described RFFF in 1981, this flap has become increasingly popular in oral and maxillofacial surgery for soft tissue defects. Despite its common use for tissue defects in clinical series, few reports have focused on elaborating the reliability of RFFF in buccal mucosa defects. This flap has many superiorities: we can easily acquire a pedicle longer than 10 cm, which is enough for buccal defects without any limitation; the mobility, pliability and thinness of the RFFF make it the ideal method for buccal reconstruction; the procedure of elevating the flap is easy and the vessel diameter is suitable for anastomosis with a high success rate.

Compared to the PF, the RFFF offers a series of advanced stages. RFFF has a high success rate, can achieve sufficiently wide mouth-opening postoperatively, can preserve the original open-mouth width, and is a reliable method for treatment of buccal defects¹⁰. Comparatively with other radial forearm flap is more cost effective also.

RFFF has a high success rate, can achieve sufficient wide mouth opening postoperatively, and is a reliable method for treatment of oral lesion.

References

1. A Camaioni, A Loreti, V Damiani, M Bellion, FM Passali, C Viti. Anterolateral thigh cutaneous flap vs. radial forearm free-flap in oral and oropharyngeal reconstruction: an analysis of 48 flaps. *Acta Otorhinolaryngol Ital* 2008;28:7-12.
2. Song M, Chen FJ, Guo ZM, Zhang Q, Yang AK. Application of various flaps to intraoral reconstruction of buccal defects after resection of buccal mucosa carcinoma. *Ai Zheng* 2009;28:663-667.
3. Deconde A, Miller ME, Palla B, Lai C, Elashoff D, Chhetri D, St. John Maie A. Squamous cell carcinoma of buccal mucosa: a 40-year review. *Am J Otolaryngol* , 2012;33:673-677.4.
4. Shah JP, Gil Z. Current concepts in management of oral cancer surgery. *Oral Oncol* 2009;45:394-401.
5. Hızkan II, Mardini S, Chen HC, Cigna E, Tang WR, Liu YT. Repair of buccal defects with anterolateral thigh flaps. *Microsurgery* 2006;26:182-189.
6. Yang G, Chen B, Gao W, Liu XY, Li J, Jiang SX, He SP. Forearm free skin flap transplantation. *Natl Med J China* 1981;61:139-141.
7. Kruse AL, Bredell MG, Lobbbers HT, Jacobsen C, Gratz KW, Obwegeser JA. Clinical reliability of radial forearm free-flap procedure in reconstructive head and neck surgery. *J Craniofac Surg* 2011;22:822-825.
8. Yang GF, Chen PJ, Gao YZ, Liu XY, Li J, He SP. Forearm free skin flap transplantation: a report of 56 cases. *Br J Plast Surg* 1997;50:162-165.
9. James PH: A reassessment of the role of the radial forearm flap in upper extremity reconstruction. *J Hand Surg* 2011;36:1237-1240.
10. Qi-Gwn Fang et al. Clinical reliability of radial forearm free flap repair of buccal defects. *World journal of surgical oncology* 2013;11:26