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Research Article

Retro-Molar Trigonal Reconstruction and Oncologic Outcomes after Resection of Large Malignant Ulcers in Elderly Patients

Abstract

Background: Buccal mucosa carcinoma represents 3 to 5% of oral-cavity cancer. Retromolar buccal trigon affected in one third of patients with buccal mucosal cancers. Squamous cell carcinoma is the commonest pathological finding.

Aim: The research was designed to study suitability of submental island flap and radial forearm free flap (RFFF) as one stage reconstructive procedure after resection of large retromolar-trigonal cancers. And to assess locoregional recurrence and disease free survival after adjuvant treatment.

Methods and techniques: Fifty three patients with retromolar-trigonal cancer underwent resection with safety margins, cervical block neck dissection and reconstruction with submental island flap and radial forearm free flap (RFFF) in oncology center Mansoura University from August 2010 to May 2014.

Results: Seven patients underwent RFFF, 46 patients reconstructed with sub-mental flap. Partial necrosis was encountered in 5 cases of sub-mental flaps but lost flaps were present in 2 cases of RFFF. 14 patients received neoadjuvant chemotherapy, 33 patients received postoperative radiotherapy. Local recurrence was 13.2%, 2 year disease free survival (DFS) was 72.7%.

Introduction

Oral cavity cancer globally, wings between the sixth to the eighth most common malignancy; it comprises more than 30% of all head and neck cancers [1-3,4]. In Egypt about 4.500 people are diagnosed with oral cancer every year [5]. Retromolar trigon (RMT) is the buccal region near the lower third molar tooth that has affected in 15% of all oral cancers [6-8]. Resection of RMT cancer with 1cm safety margins all round results in large oral defect. Small defects can be left to heal by secondary intention or are repaired by primary closure, buccal advancement flap, palatal pedicled flap, split-thickness skin grafting or tongue flap [9,10]. Reconstruction of larger retro-molar defects using pedicled buccal pad of fat flap is frequently insufficient and may be oncologically unsafe when the tumor is abutting or infiltrating the buccal pad of fat [11-15]. Pedicled and free myocutaneous flaps albeit safe and robust, are not suitable options due to additional, unnecessary muscle bulk. The pectoralis major myocutaneous flap carries about 15% flap related complications with the disadvantages of being bulky, the need of a second stage for pedicle division, unacceptable donor site scar in females [16,17]. Thus, RMT defects too wide to be covered with local flaps and are best served with regional or distant fasciocutaneous flap reconstruction. Defects of such size are typically covered with a free fasciocutaneous flap; the most commonly used of which are the radial forearm flaps (RFFF). The research was designed to test the safety and efficacy of submental island flap as one stage reconstructive procedure for large post-surgical RMT oral defects.

We evaluated this technique in comparison with the RFFF as an accepted standard of care for similar cases.

Patients and Methods

This is a retrospective evaluation of prospectively collected patients' data that was carried out from August 2010 to May 2014 for patients with buccal mucosal cancer originating in or extending to the RMT region and presenting to our clinic in Mansoura University Cancer Center in Egypt (Figure 1). We enrolled all cases with predicted post-resectional defects ≥4cm in greatest dimension. Pure soft tissue resection and marginal mandibular resections were included in the study. Patients with metastatic disease, poor performance, fully thickness bony defects necessitating mandibular reconstruction and

Figure 1: Preoperative photo of a large ulcerating SCC in the retromolartrigone (arrow).

patients who are salvaged by surgery after concurrent chemotherapy and/or radiotherapy were excluded from this study. All clinical procedures were conducted in accordance with the guidelines of the ethics committee of the Faculty of Medicine, Mansoura University, and after obtaining the written informed consent of the patients.

All patients were evaluated preoperatively by medical history, physical examination, CT scans and/or MRI from the skull base to the clavicle and biopsy from the primary lesion. Panorex films were done when mandibular infiltration was suspected. Patients with tumors extended to anterior tonsillar pillar or reached the adjacent part of the tongue base required neoadjuvant chemotherapy that consisted of cisplatin (60-100 mg/m^2/day) on day 1 and 5-FU (1000 mg/m^2/day) on days 1-4 for 3 cycles 21days interval between cycles.

Surgical procedure involves wide local excision of the RMT cancer including underlying buccinator muscle trans-orally with or without lip split and sent for frozen section to ensure adequate safety margins (more than 5mm) (Figure 2). When evident mandibular invasion was encountered, marginal mandibulectomy was carried out to achieve clear safety margins. Prophylactic tracheostomy was needed when there was airway compromise especially in cases extending to anterior tonsillar pillar and/or the tongue base.

Ipsilateral selective neck dissection (Level I-IV) was done for clinically node positive cases or radically for large, high grade and deeply infiltrative tumors. In cases where the base of the tongue is infiltrated or when the patient presents clinically with bilateral nodal disease, ipsilateral modified radical neck dissection is done and contralateral selective node dissection was done. Modified block neck dissection was indicated if matted lymph nodes or extensive cervical lymph nodes involvement is found preoperatively and if level IV nodes are positive on frozen section.

The resulting large surgical defect was reconstructed by submental island flap or radial forearm free flap (RFFF) (Figures 3a,3b). Choice of either reconstructive procedure was based on elderly age, or associated co-morbidities as diabetes mellitus and ischemic heart diseases and constrictive lung conditions that contraindicate RFFF reconstruction.

All patients were managed in the ICU for one or two days, for assuring safety of the airway and vital data, before transfer to the surgical ward. They received intra-operative antibiotics with induction of anaesthesia continued for 7 days thereafter. Tube feeding was used for 5 days before resumption of oral feeding. All our patients were referred to Clinical Oncology and Nuclear medicine department for adjuvant therapy recommendations.

Adjuvant therapy

Postoperative radiotherapy: External beam radiotherapy was used in patients with pathologically nodal positive disease (more than one lymph node, extra capsular infiltration), T3and T4a; 60Gy in 30 fractions was given to the primary site and bilateral neck lymph nodes, single fraction /day /5 settings /week using linear accelerator 6mev photon, 2 parallel opposed field. Spinal cord excluded after 45Gy.

The patients were followed monthly in the first 6 months,

Figure 2: Shows the post-resection defect (blue arrow) and the harvested submental island flap (red arrow).

Figure 3a: Submental flap inset at the defect after passing through a tunnel in the vestibule of the oral cavity (arrow).

Figure 3b: Radial forearm free flap inset at retromolartrigone defect after resection of a large SCC (green arrow) with completed arterial anastomosis (red arrow) and venous anastomosis (blue arrow).

then 3 months in the first 2 years then every six months thereafter. During follow up visit, patients were examined clinically and by neck US. Biopsy from suspected lesion was taken for histopathological examination. Cosmesis and oral functions regarding speech, swallowing and occlusion were assessed in every visit. CT or MRI neck every 3 month (Figures 4a,4b).

Statistics

Descriptive data are presented as number and percentages. Functional outcome of submental flap versus RFFF was compared using Fisher exact test.

Results

Fifty-three eligible patients were enrolled in the study. Mean age of patients was 57 (±7.15) years. Table 1 shows patients' characteristics and tumors' description. Out of 53 patients, four had histologically positive margins by frozen section and subjected to re-excision. Marginal mandibulectomy was needed in two patients due to evident cortical infiltration. Nine cases showed extension to anterior tonsillar

Figure 4a: Four months postoperative view of a submental island flap reconstruction of a retromolartrigone defect (arrow).

Figure 4b: Fourteen Months postoperative view of a radial forarm free flap reconstruction of a retromolartrigone defect (arrow).

pillar and three cases reached the adjacent part of the tongue base and required excision.

Selective neck dissection (level I-IV) was done for 47 patients; however modified radical neck dissection was needed in six patients with clinically overt neck disease. The size of the post resection defect varied from 4x4 to 5x6 cm. Reconstruction of the resulting defects was carried out by submental island flap in 46 patients and with RFFF in seven cases. All patients had smooth hospital stay and postoperative course except for 5 cases with submental island flap reconstruction had partial flap necrosis resulting in minor salivary leak which was managed conservatively. Two out of 7 cases reconstructed by RFFF suffered complete flap loss with subsequent major salivary leak and those patient required re-surgery and were backed-up by pectoralis major myocutaneous flap. Table 2 shows operative data and flap related complications, cosmetic and functional outcome. Loco-regional recurrence was detected in 7 cases (13.2) % during the first year of the follow up, 5 cases after submental flap reconstruction and 2 after RFFF. These lesions were large enough that mandate re-excision and postoperative radiotherapy. Fourteen patients received neoadjuvant chemotherapy, 33 patients received postoperative radiotherapy. The 2-year disease free survival among patients received postoperative radiotherapy was 72.7% (Figure 5).

Discussion

The decision making regarding the reconstructive approach after oral cancer extirpation, especially the retro-molar trigone, remains a clinical dilemma, which is complicated by the enormous array of procedures suitable for a given defect, each one offering pros and cons.

However, when dealing with a large retro-molar trigonal defects there is limited reconstructive options as nearby local mucosal or palatal flaps that are usually insufficient, and could result in large denuded areas [9,10], and other pedicled regional or distant flaps as

the pectoralis major myocutaneous flap are often bulky with difficult inset in this posteriorly located defect [16-19].

The commonly used reconstructive procedure for those large retro-molar trigone defects are the microvascular free flaps especially the radial forearm free flap which becomes the state of the art reconstructive method for almost all oral defects being thin, pliable, wide caliber and long vascular pedicle [20-23], nevertheless, this

Table 1: Patients characteristics and Tumor description" (N=53 patients).

Characteristics	No.(%)
Gender	
Males	40(75.5)
Females	13(24.5)
Associated comorbidities	
Diabetes mellitus	34 (64)
Ischemic heart disease	10 (18.8)
Chronic obstructive chest disease	2 (3.8)
Chronic compensated liver disease	13 (24.5)
Tumor pathology	
G1-2 SCC	48(90.6)
G3 SCC	5 (9.4)
Primary tumor site	
- RMT	33(62.3)
- Buccal mucosa extending to RMT.	20(37.7)
Defect anatomy	
• Vestibular mucosa only	37 (68.8)
• Tonsillar pillar	9 (16.9)
• Tongue base	3 (5.6)
• Mandibular periosteum	2 (3.7)
• Mandibular cortex	2 (3.7)
T stage (AJCC)	
T2	31(58.5)
T3	20(37.7)
T4a	2(3.8)
cN stage (AJCC)	
N0	9 (17)
N1	25(47.2)
N2a	13(24.5)
N2b	6(11.3)
Neo-adjuvant chemotherapy	14 (26.4)
Postoperative radiotherapy	33 (62.3)
Loco regional recurrence	7(13.2)
AJCC: American Joint Committee on Cancer staging manual.	

Table 2: Operative details,flap-related complications, Cosmesis and functional outcomes".

| Type of reconstruction	Submental island flap (N=46)	RFFF (N=7)	P value (Fisher test)
Operative details			
Flap harvest time in min	45+ 10	90+ 20	
Surgical teams	Single	Two	
Flap necrosis			
Partial 015	5	0	P=NS
Complete	0	2	P=0.015
Salivary leak	5	2	P=NS
Cosmesis	Good	Excellent	
Oral function			
Mouth occlusion	Satisfactory	Satisfactory	
Mastication	Not disturbed	Not disturbed	
Swallowing	Easy	Easy	
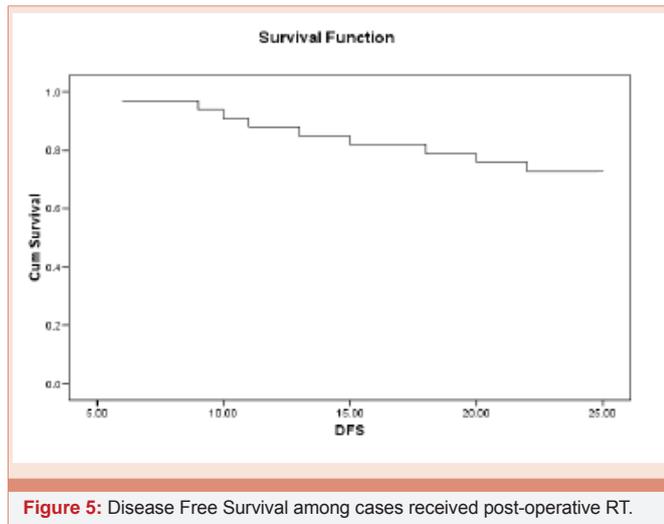
Figure 5: Disease Free Survival among cases received post-operative RT.

microvascular techniques require good patient performance, expertise and facilities. Therefore, not all patients or centers are candidate for this sophisticated and lengthy micro-surgical techniques.

The submental island flap had emerged as a simple, secure, easy, versatile reconstructive technique for those large retro-molar trigonal defects and other oral and perioral defects with comparable oncological and functional outcome [24-27]. In addition to, anterior belly of digastric muscle taken within flap ensures closing of dead space and gives support to cheek especially after resection of buccinator muscle. Postoperative radiotherapy has no effect on flap viability or its texture. Removing excess submental skin redundancy with primary closure of donor site gives cosmetic improvement. In our study we found no cases of complete submental island flap loss even in elderly patients with associated co-morbidities, so it is suitable for nearly all cases of the study. On the contrary, radial forearm free flap was selected only for those fit patients, required longer operative time, prolonged hospital stay, continued anticoagulant therapy for at least 6 months and showed higher rate of total flap loss and donor site morbidities.

The only disadvantage of the submental island flap is hair bearing inside oral cavity in male patients and might be the proposed concept of its interference with sound oncologic neck dissection.

As regard lymphadenectomy, proper neck node staging is done for all the cases by resecting at least ten lymph nodes in positive cases to achieve accurate pN stage [28].

But there is still controversy about interference of SMIF harvesting with sound oncologic lymph node dissection [29].

In our study the local recurrence reported in 13.2% of our patients. Coppen et al. [30], reported 25% a local relapse, Diaz et al. [31], reported an overall recurrence rate of 45% (54/119) and a local recurrence rate of 32% (38/119). Ghoshal et al. [32], documented a 2% regional recurrence rate while Bachar et al. [33], reported that regional recurrence occurred in six patients and local and regional recurrence in four patients (70 patients included in this study) also Hakeem et al. [34], reported a local recurrence in (9.6%).

In the present study the 2-year DFS was 72.2 and this result is similar to that of Ghoshal et al. [32], who reported 2-year DFS in radically treated patients 76.4%.

Conclusion

Judicious use of submental island flap offers an easy way to reconstruct large intra-oral defects. We believe thatfree flaps in head and neck reconstruction are an ideal procedure but need advanced surgical skills and not suitable for most of our patients in Oncology Center- Mansoura University, and we suggest that the submental flap should be present in the reconstructive surgeon armamentarium when dealing with large retro-molar trigonal defect.

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