

Comparison of Nasolabial Flap Vs. Pectoralis Major Myocutaneous Flap in Small Buccal Mucosa Carcinoma

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Abstract: ***Background & Objective:** Reconstructing buccal defects with proper flaps can expand the indications of surgery, improve quality of life and prolong survival. This study was to investigate the indications for such application, the selection of different kinds of flaps and the skills of the reconstructive operation. **Patients & Methods :** A total of 30 patients with small buccal mucosa carcinoma were included in this study. The patients were divided into two groups, Group A was reconstructed by Nasolabial flap, Group B was reconstructed by Pectoralis Major myocutaneous flap. The both group compared in relation to operative time consumption, intra operative bleeding ,cosmetic and functional outcome, postoperative complication and morbidity. **Results:** good cosmetic and functional results were obtained in patients operated by nasolabial flap with less operative time consumption, intra operative bleeding , postoperative complication and morbidity. **Conclusions:** The nasolabial flap is a good flap for the reconstruction of small oral defects after excision of primary tumors and results in good overall cosmetic and functional outcome.*

Keywords: Nasolabial flap, Pectoralis Major myocutaneous flap, buccal mucosa carcinoma

1. Introduction

Oral cancer is the sixth most prevalent cancer in the world and is largely preventable. ^(1,2) It accounts for approximately 4% of all cancers and 2% of all cancer deaths worldwide. ⁽³⁾ In India, it is the commonest malignant neoplasm, accounting for 20 to 30% of all cancers. ⁽⁴⁾ Worldwide, the overall survival rate for this disease in 1987 was 50.7% and the incidence and mortality have remained virtually unchanged over the past two decades. The high mortality is in part due to the advanced stage of the disease at the time of diagnosis. The 5-year survival rate for patients with localized disease at the time of diagnosis is approximately 75% as compared to less than 10% for those with distant metastases. ⁽⁵⁾ Amongst the prevalent oral carcinomas, oral squamous cell carcinoma (OSCC) of the buccal mucosa is a very common affliction among Indians. Ninety-eight percent of these patients chew either natively processed tobacco leaves or tobacco stem along with betel leaves (piper betel), arecanut (areca catechu) and shell lime. ⁽⁶⁾ Other suspected but not confirmed etiologic agents include human papilloma virus, poor oral hygiene, and chronic irritation. Premalignant conditions include submucosal fibrosis and lichen planus. The latter has a reported transformation rate of 0.5-3%, whereas the former has a malignant transformation rate of 0.5%. Buccal carcinoma commonly presents as a slow-growing mass on the buccal mucosa. Small lesions tend to be asymptomatic and are often noted incidentally on dental examination. Pain commonly occurs as the lesion enlarges and ulceration develops. Oral intake may worsen the pain and lead to malnutrition and dehydration. Associated symptoms include bleeding, poor denture fit, facial weakness or sensory changes, dysphagia, odynophagia, and trismus. Comprehensive examination of the head and neck should be conducted with a focus on the oral cavity. The mucosa of all

the subsites of the oral cavity and oropharynx should be examined systematically. Palpation is important to determine the depth of invasion. Mandibular or maxillary alveolar invasion should be noted on inspection and palpation. Dentition must also be assessed, especially if irradiation is part of the planned management. The neck and parotid gland should be carefully examined for adenopathy. 27% of patients presented with clinically positive nodes. The risk of nodal disease at presentation increases with advanced-stage disease. The rate of nodal metastases at presentation was 40% for T2 disease and 52% for T3 disease. Signs of advanced disease on physical examination include bleeding, skin ulceration, facial swelling, neck mass, trismus, facial numbness, and paralysis of the facial musculature. The lesion often has 1 of 3 morphologic types: exophytic, ulceroinfiltrative, or verrucous. The exophytic type is the most common, appearing as a papillary mass that becomes ulcerated when large. The ulceroinfiltrative variety appears as an ulcer that penetrates deep into the underlying structures, with surrounding induration. Verrucous carcinomas are uncommon variants of oral-cavity carcinomas; among these, the buccal mucosa is the most common site. These lesions appear as papillary masses, and keratinization gives them a whitish appearance. Contrast-enhanced CT scanning or MRI of the primary site and neck is helpful for providing staging information of both the primary tumor and neck, as well as for treatment planning. Squamous cell carcinoma is the most common malignancy of the buccal mucosa, accounting for more than 90% of cases. The nasolabial flap is a very simple flap used for reconstruction of intraoral defects in buccal mucosa. The choice of pedicle is based on the site of the defect and any need for rotation or advancement of tissue to the site of the defect [7]. The flap may be thick or thin, depending on the requirement of the defect and the thickness of the donor tissues. Intraoral reconstruction with a nasolabial flap is a simple and fast procedure with minimum

donor defect and complications. A unilateral nasolabial flap can cover a defect of 2 to 3 cm, The nasolabial flap is an axial flap but may be utilized as a random flap [8]. The flap receives its blood supply from the angular artery (a branch of the facial artery), the infraorbital artery, and the transverse facial artery [9]. This rich vascular anastomosis between all the feeding vessels makes it an ideal and versatile flap for reconstruction of buccal mucosa. The nasolabial flap can also be used as an interpolation flap in either a single or a staged technique. Disadvantages of the nasolabial flap are that there is a limited amount of tissue available, the reconstruction may lead to asymmetry, and a 'pincushioning' effect of the cheek can occur when the flap is used for intraoral reconstruction. The flaps are elevated directly under vision; the plane is deep to the subcutaneous tissue and superficial to the underlying muscles [10]. During dissection, the facial artery, submental artery, and external jugular vein are ligated if the neck dissection is combined with the resection of a primary tumor in a clinically node-positive neck. For all of our reconstructions, inferiorly based flaps were utilized. The tip of the flap was extended to a point approximately 15 mm distal to the medial canthus, while the width depended upon the width of the defect. If the facial artery was preserved, a width to length ratio of 1:3 was maintained. In cases where the facial artery was ligated, a ratio of 1:2 was maintained. After the flap was raised to the desired extent, it was rotated inwards and inset using 4/0 Prolene® sutures. The mucosal part of the flap was sutured using 3/0 Monosyn®. For reconstruction of the buccal mucosa where no incision was made on the lips, the flap was inset using a buccal tunnel [11]. After 3 weeks, the flap was divided and the tunnel was closed. Pectoralis Major myocutaneous flap are its reliable vascularity and good viability, protection of carotid artery and acceptable cosmetic appearance in cases where bulk of tissue is required. In addition, this flap can easily be used in irradiated areas and even a large cutaneous island of donor site closed primarily. [12]

2. Marking of flap

Landmarks: First of all acromion, xyphoid and medial end of the clavicle was marked. Then the line was drawn from the xyphoid to the acromion. A second line is drawn perpendicular to this line that bisects the clavicle. The course of the Thoracoacromial artery corresponds to the line drawn from the midpoint of the clavicle continuing to the medial portion of the acromion to xyphoid line.

Skin Paddle: Size and location of the skin paddle depends on the soft tissue defect. The skin paddle was designed at the infero-medial border of the pectoralis major muscle that is inserting on the lateral border of the sternum and the second to sixth costal cartilage.

Flap elevation: The size and location of the skin paddle over the pectoralis major muscle was designed following basic principles of plastic surgery that is, planning in reverse. First incision was made from the lateral edge of designed skin paddle toward the anterior axillary line. This incision can be made above or below the nipple depending upon gender of the patient. The incision was deepened down to the pectoralis

major muscle so that medial and inferior extents of the muscle could be identified. All the incisions were made through the fascia, muscle up to the chest wall except superior one which is made down to the muscle fibers. Once the skin paddle has been isolated and remaining skin lying over the muscle has been separated, the muscle is divided distally and dissection performed proximally towards the clavicle up to the dominant pedicle which can be visualized in the deep surface of muscle.

3. Patients and Method

A total of 30 patients (22 Males & 8 Females) with small buccal mucosa carcinoma were included in this study. All the patients had T2 or T3 disease with N0/N1 status on clinical examination and computed tomography and none of them received neoadjuvant radiation. Excision of the primary tumor was combined with neck dissection in all cases. The patients were divided into two groups, Group A included 20 patients which were reconstructed by Nasolabial flap, Group B included 10 patients which were reconstructed by Pectoralis Major myocutaneous flap. The both group compared in relation to operative time consumption, intra operative bleeding, cosmetic and functional outcome, postoperative complication and morbidity. Only seven patients received postoperative adjuvant radiotherapy.

4. Results

The results presented a significant difference in between two procedures regarding the intra operative time consumption, Nasolabial flap reconstruction takes less time as compared to PMMC flap. Nasolabial flap gives good cosmetic & functional results as compared to PMMC flap with less intra operative bleeding & morbidity. There was no significant difference in recurrence rate between two groups.

5. Discussion

The versatility and usefulness of the nasolabial flap is well known. The flap has a good vascular supply; hence, survival is high. An abundant blood supply allows for a length to breadth ratio of 3:1. The flap is good for small and intermediate (T1 to T3) intraoral defects. The blood supply of the nasolabial flap is attributed mainly to the facial artery. However, this artery was ligated in the neck dissection in the some of our cases without any adverse effect on the viability of the flap, indicating that it may not be the facial artery but is more probably the rich subdermal plexus that supplies the skin flap. The fact that this flap withstands radiotherapy signifies its excellent vascularity. The disadvantage of this method of reconstruction is the need for a second-stage procedure in some of the cases, where a buccal tunnel is used for inseting the flap or a second-stage commissural correction is required. These procedures are minor and so can be done under local anaesthesia. There may be other problems, such as cheek biting or a bulky base of the flap passing over the alveolus, causing problems in those wearing dentures, especially when the flap is used to repair alveolar defects. Dental implants may provide a good solution to this problem. Possible post-reconstruction outcomes are flap

necrosis due to hematoma, infection, or tension on the suture line, where further surgery may be required. Although rare, one may encounter wound complications and partial or total reconstruction failure owing to insufficient arterial flow or venous drainage. Flap survival depends on the early recognition of flap compromise, such as ischemia and necrosis. Smoking is also associated with an increased risk of flap failure because smoking has deleterious effects on flap survival by aggravating hypoxemia and vasoconstriction. Hematoma may result from inadequate hemostasis and drug-induced coagulopathy, hence medications inducing coagulopathy, for example, acetylsalicylic acid and non-steroidal anti-inflammatory drugs and vitamin E, should be avoided at least 2 weeks before and 1 week after surgery. Hematoma formation may reduce tissue perfusion and can lead to ischemia and necrosis by inducing vasospasm and stretching of the subdermal plexus or by separating the flap from its recipient bed. Congestion is the most common problem associated with facial flaps. Venous congestion can lead to arterial compromise and flap necrosis. Infection can also complicate flap healing. The postoperative wound infection rate is 2.8% for facial surgery, with higher rates in facial reconstruction using local flaps. The use of flaps for reconstruction may interfere with the normal sensation and neurological afferent control that provides sensory guidance to speech and swallowing. Furthermore, especially in men, if a flap is taken from hair-bearing skin to reconstruct a surgical defect, then that area of tissue will continue to grow hair. This can be prevented by outlining the flap. It can also be seen that postoperative radiotherapy may decrease the growth of hair and ultimately lead to mucosalization of the flaps. There may also be a pincushioning effect around the nasolabial folds, which could be avoided by using a rhomboid design. An ipsilateral nasolabial flap can cover small defects up to 2 cm but if a larger defect of size approximately 5 × 5cm or more is to be reconstructed, a bilateral nasolabial flap can be utilized successfully.

6. Conclusion

The nasolabial flap is versatile for covering or reconstructing small or medium-sized defects of the oral cavity in selected patients. However, this type of reconstruction is not particularly suitable when teeth are present in the area to be reconstructed and biting on the pedicle may even damage the skin. As even small defects require reconstruction, the nasolabial flap has proven to be a useful and reliable alternative without causing much morbidity to the donor site.

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