Management of Oral Squamous Cell Carcinoma of Buccal Mucosa and Soft Tissue Reconstruction with Pectoralis Major Myocutaneous Composite Flap: A Rare Case Report

Keshav Kumar Agarwal, Ramakant Dandriyal, KY Giri, Aishwarya Pratap Singh, Himanshu Pratap Singh

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

The size and thickness of the primary lesion, extent of local invasion and extracapsular spread and the primary site of involvement are the chief determinants of the rapidity and extent of metastasis. Generally, the OSCC metastasizes to the ipsilateral cervical lymph nodes. Contralateral metastases typically occur in the carcinoma of the tongue, midline or in the advanced cases.7,8 Surgery remains the primary modality of treatment for most head and neck cancers, and wide adequate resection of the primary tumor with removal of the lymph nodes draining the area for possible metastatic disease has remained the norm. Recently, however, procedures more conservative and less radical than the classic neck dissection have gathered favor, chiefly due to increased patient compliance and acceptability. These include supraomohyoid neck dissection (SOHND) and modified radical neck dissection (MRND) sparing either the accessory spinal (CN-XI), the sternocleidomastoid (SCM) or the internal jugular vein (IJV) depending upon the extent, with the aim to minimize the postoperative morbidity.

The following report demonstrates a case of well differentiated OSCC involving the buccal mucosa with clinically palpable level Ia (submental) and level Ib (submandibular)
lymph nodes (ipsilateral) using conventional wide excision with SOHND and reconstruction using pectoralis major myocutaneous composite (PMMC) flap.

**CASE REPORT**

A 55-year-old male presented to the department of oral and maxillofacial surgery with a complaint of pain, swelling and difficulty in chewing and swallowing. An ulcerative, exophytic growth involving the left buccal mucosa extending from the corner of the mouth anteriorly up to the vestibular fold opposite lower left molar region posteriorly and the depth of the vestibule inferiorly was seen upon clinical examination (Fig. 1A). A previously performed incisional biopsy had confirmed the lesion to be a well differentiated OSCC. Clinical examination further revealed palpable (but not fixed) single level Ia (submental) and two level Ib (submandibular) lymph nodes. Other groups remained clinically indeterminate. Orthopantomogram revealed that the underlying alveolus was uninvolved and that the lesion was confined to the soft tissues (Fig. 1B).

A wide excision with SOHND and primary reconstruction using ipsilateral PMMC paddle was planned. Submandibular incision crossing midline with the posterior limb extending up to the mastoid region was used to expose the level Ia, Ib nodes alongwith the submandibular gland (Fig. 2A). Platysma and fascia reflected and marginal mandibular nerve was preserved. Facial artery and vein were encountered and ligated. Sternoceleidomastoid was retracted to facilitate the exposure and the involved nodes along with the gland (due to proximity of the involved node to the gland capsule) were sacrificed (Fig. 2B). Wide excision markings were placed on the primary and the execution was carried out using surgical blade and diathermy. Margins of 1.5 cm were maintained throughout and the oral commissure was

Figs 1A and B: Intraoral presentation (A) and noninvolvement of alveolus in digital OPG radiograph (B)

Figs 2A to D: Wide excision of the lesion with supraomohyoid neck dissection (SOHND): (A) incision markings, (B) SOHND (level Ia, Ib with submandibular gland), (C) markings for wide excision (WE) and (D) defect after WE and SOHND
included to facilitate the process (Fig. 2C). The specimens were sent for frozen section.

Following the confirmation of negative margins, the ipsilateral mammary region was prepared and flap was outlined after evaluating the size of the defect following excision (Figs 2D and 3A). The paddle was placed horizontally, excluding the areola, extending from midline medially and crossing the lateral border of the muscle laterally. Paddle for lining defect was placed around the nipple to facilitate nourishment by two sets of perforators. The paddle for the skin defect was placed on the medial edge of the muscle. Through this incision, the placement of paddle over the muscle was visualized. An elliptical incision was then made involving both paddles and deepened till the muscle. The plane between the pectoralis major and pectoralis minor muscles was then developed (Fig. 3B). The muscle was cut on both sides of pedicle till the clavicle. The flap was then transposed over the clavicle to the defect. After identifying the perforators, the flap was sharply elevated over the surface of the underlying ribs. Primary closure of the donor site (Fig. 3C) followed by the placement of a suction drain was then done. The pedal was then inset into the defect and adapted to the margins appropriately. Layered closure was accomplished using 4-0 resorbable poly-galactide and 4-0 nylon (Fig. 3D).

Patient was sent for postoperative radiotherapy 6 weeks following the surgery (Fig. 4A) and evaluated for upto 1 year (Fig. 4B) for recurrence.

DISCUSSION
Cancer of the head and neck remains a therapeutic challenge owing not only to the difficult patient management
but chiefly due to the myriad of carcinogenic stimuli and variations in the habits of the populace making it difficult for the surgeon to determine the ‘standard’ treatment protocol. Several authors have qualified the role of SOHND in the management of cancers of the upper aerodigestive tracts. Chu and Strawitz in a retrospective study of 261 patients showed that supraomohyoid neck dissection is associated with an unusually high recurrence rate in the neck in patients with histologically negative nodes.9

Modified radical neck dissection and standard radical neck dissection were equivalent in neck recurrence and 5-year survival rates when the disease was above the Jugulomohyoid lymph node group. Jesse et al10 evaluating 310 patients, found the spinal accessory nerve-sparing neck dissection to be at least equal in its disease control function to the classic neck dissection. The nerve-sparing (modified) neck dissection was offered to all patients in whom the nerve itself was not directly involved by cancer.

Recently, Morgan et al11 have dispelled the myth of the value of contralateral supraomohyoid dissection in patients with cancer of the upper aerodigestive tract. In 247 patients, they found the dissection to be of no benefit; only 2% of patients with clinically negative nodes were found to have histologic metastases and 1% of patients developed metastases in the contralateral neck after a negative supraomohyoid dissection on that side. However, the SOHND remains for the reasons of feasibility and practicality (least postoperative morbidity and therefore more patient acceptance), the most accepted and commonly performed procedure in the management of head and neck cancer limited to ipsilateral neck nodes. Uneventful follow-up and postoperative survival rates however remain the gold standard in evaluating any such procedure however.

Alternatives such as cryosurgery via the cryoprobe are now recognized as not being the panacea for head and neck lesions. It is best suited for certain benign lesions not always managed best by surgical excision, such as hemangiomas, varicosities, linear and facial warts, mucous cysts, painful ulcers, and locally recurring lesions of the facial bones. The treatment is relatively painless, and healing by secondary intention leaves minimal scarring. However, cryosurgery does not provide specimens whose margins can be examined for adequate excision and therefore has limitations in treating dysplastic and malignant lesions.12

Reconstruction after ablative surgery for head and neck cancer was greatly helped by the recognition and development of axial and random-pattern skin flaps. For many years, the deltopectoral or Bakamjian flap was widely used. The demonstration of musculocutaneous vessels between muscle and the overlying skin by McCraw et al has led to one-stage reconstruction of difficult head and neck wounds using musculocutaneous flaps. The muscle groups utilized for pedicles include the latissimus dorsi, whose dominant artery is the lateral thoracic; the use of this pedicle is limited to the neck. The SCM receives its blood supply from the occipital, the superior thyroid artery, and the thyrocervical trunk, allowing musculocutaneous flaps to be designed at either end of this muscle, based on the superior or inferior blood supply.13 Also used is the platysma musculocutaneous flap, as described by Futrell et al14 the blood supply for this sometimes poorly developed muscle is from the transverse cervical artery and the mandibular branch of the facial artery.

Guillamon-Degui and Larson have described a lateral trapezius musculocutaneous flap based on the transverse cervical artery and vein. This flap can include the spine of the scapula to replace a segment of the mandible.15 Free flaps have also been used; the most successful is the osteomyocutaneous free flap encompassing a segment of the fifth or sixth rib with the associated intercostal muscles and overlying skin along with the internal mammary artery, vein, and intercostal vessels. After positioning the bone and skin properly, the internal mammary vessels are anastomosed to an artery of appropriated size in the neck utilizing the operating microscope. The rib is nourished by the periosteal vessels and the skin by the musculocutaneous vessels.16 The PMMC flap derives its blood supply from the anastomosis between thoracoacromial and internal mammary arteries and is extensively used to reconstruct defects involving following excision of head and neck cancers.

Primary reconstruction of such defects with microsurgical techniques is now the protocol in all major cancer centers. But in view of the long operative time, the need for expertise and infrastructure and the large work volume in developing countries, microsurgical reconstruction cannot be offered to all patients with such defects.17 The large volume of the incumbent tissue (overlying skin along with muscle) and the long length of the pedicle make it one of the most suitable flaps for head and neck reconstruction. The only minor issue however remains is the vascularity and the inability to bipedal the flap without compromising the same.18

**CONCLUSION**

To some extent, the supraomohyoid neck dissection addresses the dilemma as of how to properly manage the neck. Works of Henick, Kligerman, Medina and Kowalski support the performance of elective neck dissections for T1N0 and T2N0 OSCCs. Others such as Byers, Ariyan have stressed the importance of including level IV when managing the N0 neck where the primary is involving the tongue. Although many contest the use of the supraomohyoid neck dissection in the management of the neck, the more
recent evidence such as that by Mauzaffar K in 2003 suggests the efficacy of this type of neck dissection with postoperative radiation therapy in the management of head and neck cancer patients with an N+ neck. From the time of Ariyan’s description in 1979, the PMMC flap has been the workhorse for head and neck reconstruction. Easy reach of the flap, reliable vascularity, technical simplicity, coverage of the exposed vessels by muscle after neck dissection and the ability to provide bulk has made it a popular option among oncoreconstructive surgeons. Although, the limited size of the available skin paddle and unesthetic contracture band at the neck are a concern, the flap itself is simple to perform and based on sound anatomical concepts and especially useful for reconstruction of composite cheek defects.

REFERENCES
