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Reconstructive techniques in head and neck malignancies

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ABSTRACT

Background: Head and neck malignancies are of common occurrence in India requiring early diagnosis for effective reconstruction by various surgical techniques. The aim of the present study was to evaluate the pattern of involvement of head and neck malignancies and to evaluate various surgical resection and reconstruction techniques used in the management of head and neck malignancies.
Methods: This is a retrospective study carried out in the Department of ENT and Head & Neck Surgery and Department of Surgical Oncology, Karnataka Institute Of Medical Sciences, Hubballi, from July 2015 to December 2016. All patients who underwent surgery for head and neck malignancy were included in our study.
Results: Retrospective analysis of our study yielded 36 cases of which 29 patients were male and 7 were female. In our study commonest age group was 6th and 7th decade constituting 55.55%. The most common site involved was oral cavity constituting about 63.88%. The most common sub-site in oral cavity malignancy was found to be anterior 2/3rdof tongue (25%), followed by lip and buccal mucosa each of which constituted 13.88%.
Conclusions: In our study oral cavity was the most common site to be involved in head and neck malignancies, of which anterior 2/3rd of tongue is the most common sub-site. Majority of the patients underwent tumour resection with flap reconstruction. Locoregional flaps form an efficient alternative in cases where primary closure is not possible without compromising the aesthetic outcomes.

Keywords: Head and neck malignancy, Squamous cell carcinoma, Pectoralis major myocutaneous flap, Nasolabial flap, Larygectomy

INTRODUCTION

Head and neck malignancy is the sixth most common malignancy worldwide. Statistics indicate that there are about 640,000 cases of head and neck malignancy per year, resulting in approximately 350,000 deaths per year.[1]

The incidence is more common in males, ratio ranging from 2:1 to 4:1. In India the incidence of head and neck malignancy accounts for about 1/3rd of all cases of which oral cavity is the most common site. Poverty, lack of knowledge about the disease, advanced stage of presentation, lack of access to healthcare and poor medical infrastructure pose a major challenge in the management of these cancers in the rural areas.

The presence of nodal metastasis is the most significant predictor of adverse outcome in head and neck malignancies.[2] Surgery has been the mainstay for primary management of oral cavity cancer while radiotherapy is offered postoperatively to patients at high risk for loco regional recurrence.[3] Head and neck tumour resection leads to complex defects that are difficult to reconstruct. In addition to the anatomical defects, functional loss, cosmetic disfigurement and accompanying psychosocial effects can be devastating to the patient. The various reconstructive options range from simple primary

closure, skin graft, loco regional flaps, and pedicled flaps to more complex micro vascular free flaps.[4] The Choice of method of reconstruction depends on multiple factors like location of health setup, availability of skilled plastic surgeons and patient factors like site and size of the defect, the projected functional morbidity, other comorbid conditions, understanding of disease by the patient and relatives.

Neck dissection is simultaneously done for either clinically evident nodal disease or for large primary tumour or tumour with depth of invasion greater than 4 mm.[3]

Hence, the study is undertaken to evaluate the pattern of involvement of head and neck malignancies and various surgical modalities used in the management.

METHODS

This is a retrospective study carried out in the Department of ENT and Head & Neck, and Department of Surgical Oncology, Karnataka Institute of Medical Sciences, Hubballi, from July 2015 to December 2016. All patients suspected of malignancy in head and neck region underwent thorough clinical examination, radiological imaging including CT scan & MRI and tissue diagnosis was established by biopsy and histopathological examination.

After tumour board discussion, the best treatment modality for each patient was formulated. All patients who underwent surgery for head and neck malignancy were included in our study.

Exclusion criteria were patients with systemic metastasis, patients presenting in inoperable stage and patients not fit for surgery due to systemic co-morbidities.

RESULTS

In this study total of 36 cases from July 2015 to December 2016 were taken.

Sex distribution

Out of total 36 patients included in this study 29 were male and 7 were female with ratio of 4.1:1.

Table 1: Sex distribution.

Sex	Number	Percentage
Male	29	80.55
Female	7	19.44

Age distribution

In our study, 13.88% patients were less than 40 years of age, 19.44% in the age group of 41-50, 30.55% in the age group of 51-60, 30.55% in the age group of 61-70 and 11.11% were more than 70 years of age. Thus in our study highest number of patients belongs to 6th decade that constituted 30.55% of total cases.

Table 2: Age distribution.

Age-group	Number	Percentage
<40	5	13.88
41-50	7	19.44
51-60	11	30.55
61-70	9	25
>70	4	11.11

Distribution of primary tumour

In our study the most common site of primary tumour was in oral cavity (63.88%), of which the most common subsite was in the tongue (anterior 2/3rd) (25%) followed by lip and buccal mucosa each of which contributed 13.88% of total Head and Neck malignancies.

Table 3: Primary tumour distribution.

Site	Number	Percentage
Tongue	9	25
Lip	5	13.88
Buccal mucosa	5	13.88
Alveolus	2	5.55
Floor of mouth	1	2.77
GLS/GBS	1	2.77
Temporal bone	3	8.33
Larynx	2	5.55

Staging

In our study majority of patients were in T_2 staging constituting about 41.66%, followed by T_3 which constituted about 27.77%. T_1 constituted about 11.11% and T_4 constituted about 19.44%.

Table 4: Tumour stage.

Stage	Number	Percentage
T1	4	11.11
T2	15	41.66
T3	10	27.77
T4	7	19.44

Type of neck dissection

Based on the depth of the tumour invasion and nodal involvement by clinical and radiological assessment the decision to include neck dissection as part of the treatment strategy was formulated. In our study 28 out of 36 patients (77.77%) underwent neck dissection. 11 patients underwent supra-omohyoid neck dissection (SOND) constituting 39.28%, out of which 1 patient

(3.57%) underwent bilateral supra-omohyoid neck dissection. Out of the total number of cases, 2 patients (7.14%) underwent bilateral selective lateral group neck dissection.

Table 5: Type of neck dissection.

Type of neck dissection	Number	Percentage
Supra omohyoid neck dissection (SOND)	11	39.28
Modified radical neck dissection (MRND)	9	32.14
Selective neck dissection (SND)	5	17.85
Extensive SOND	3	10.71

Type of reconstruction

In our study 41.66 % patients were reconstructed with primary closure. Amongst the 58.33% patients requiring locoreginal flap reconstruction, the most commonly used flaps were pectoralis major myocutaneous flap and nasolabial flap, each of which constituted about 13.88%.

Table 6: Types of reconstruction.

Type of reconstruction	Number	Percentage
Primary closure	15	41.66
PMMC flap	5	13.88
Nasolabial flap	5	13.88
Abbe estlander	3	8.33
Forehead flap	3	8.33

DISCUSSION

In our study, males were commonly affected than females in a ratio of 4.1:1. Most commonly affected age group was 6th and 7th decade. In a study conducted by Das et al, it was found that males were commonly affected than females with a ratio of 2.1: 1.[1] Talabanietet al, in their study, females were generally less affected than males with a ratio of 1.5:1.[6] In another study conducted by Kokemueller et al [7] there were 226 males and 115 females with a ratio of 2:1.

In our study, the most common site of head and neck malignancy was found to be in oral cavity, of which the most common subsite was tongue (anterior 2/3rd), followed by lip and buccal mucosa. This is due to substance abuse of tobacco, areca nut, betel nut which is commonly practised in rural areas.

In our study, 41.66 % patients presented in T2 stage. With effective health education and community awareness about these conditions, the aim of health care providers should be earlier detection of such cases.

The primary modality of treatment in most of the head and neck malignancies is surgery. The postsurgical deformities can have devastating effects on appearance and can significantly impair patient's quality of life. The main objective of reconstruction is to restore morphology and function of lost tissue and microsurgical techniques have always been the first option. However, these are complex procedures requiring high degree of expertise and is associated with certain limitations in patients of advanced age and other co morbid conditions. In our study, most common method of reconstruction used was flap reconstruction (58.33) %, of which most commonly used flap was pectoralis major myocutaneous flap and nasolabial flap each constituting about 13.88%. Hence, for small to medium sized defects, loco-regional flaps has shown to be an efficient alternative to microsurgical flaps without compromising the aesthetic outcomes.

Pectoralis major myocutaneous flap is a robust flap which was considered as work horse in head and neck reconstruction. It receives its vascular supply from the pectoral branch of the acromiothoracic artery which arises from the first part of axillary artery. Its advantages are large skin territory, high vascularity and large arc of rotation. This flap is close to the head and neck region thus easily available for reconstruction. This is a useful flap in a peripheral centre like ours where most of our patients belong to lower socio economic status. Donor site deformity, functional disability and bulk are the main disadvantages against its universal use.[8]

Nasolabial flap is a local arterialized flap with an axial blood supply either by the facial artery (inferiorly based flap), or by the superficial temporal artery through its transverse facial branch, and the infraorbital artery (superiorly based flap).[9-11] It can be easily raised, has reliable aesthetic results, versatile as it is used to reconstruct small to medium sized defects in orofacial region. The main disadvantage, being two stage procedure which requires flap release done as minor procedure under local anaesthesia

In our study, 5.55% patients had laryngeal malignancy, of which all underwent total laryngectomy with bilateral selective neck dissection. One patient developed chyle leak during immediate postoperative period which got secondarily infected, leading to subcutaneous abscess and flap necrosis. This complication was managed by by daily wound debridement with betadine, hydrogen peroxide and icthymol glycerol dressing.

In our study 8.33% of cases had temporal bone malignancy of which 1 patient underwent lateral temporal bone resection with pectoralis major myocutaneous flap reconstruction.1 patient had intracranial extradural extension for which lateral temporal bone resection followed by craniotomy and tumour excision was done.

One among the 3 had skin involvement for which lateral temporal bone resection was done and part of skin involved by the tumour subjected to wide local excision with adequate margins. All three patients received postoperative radiotherapy.

In our study, most common type of neck dissection done was supraomohyoid neck dissection (39.28 %) followed by modified radical dissection (39.14%). Decision for neck dissection was based on clinical evaluation, depth of tumour invasion and radiological features suggestive of tumour invasion in lymph node area.

Figure 1: Harvesting of pectoralis major myocutaneous flap.

Figure 2: Elevation of pectoralis major myocuaneous flap.

Figure 3: Partial glossectomy.

Figure 4: Nasolabial flap.

Figure 5: Nasolabial flap recontruction.

Figure 6: Buccal mucosa defect.

Figure 7: Submental flap.

Figure 8: Submental flap reconstruction.

Figure 9: Elevation of sub platysmal flap.

Figure 10: Supra omohyoid neck dissection.

CONCLUSION

Head and neck malignancies commonly occur due to substance use and presented most commonly in 6th and 7th decade. Males were found to be more affected than females in the ratio of 4.1:1. Oral cavity was the most common site to be involved in which early diagnosis can lead to successful primary closure. Loco regional flaps form an efficient alternative in cases where primary closure is not possible.

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