

Prevalence of maxillectomy defects among patients visiting in an institutionalized hospital setting: A prospective, single-institute study

ABSTRACT

Introduction: The rehabilitation of a patient undergone maxillectomy requires a prosthesis that provides with the optimum appearance and functional results. Scarce literature has been published regarding the prevalence of maxillary defects related to palatal obturator prosthesis. This study evaluates the incidence of the maxillectomy defects among different age groups, gender, side involved, and etiology.

Materials and Methods: This is a prospective study of maxillectomy defects cases which reported and were treated in the department over a period of 2 years (2015–2017). Information regarding general identification, gender, and age at which the patient was operated for surgical resection of the maxilla or diagnosis of the tumor, affected side and etiology, and the time lag between surgical resection and rehabilitation was recorded from the clinical records of the patients.

Results: A total of 30 patients reported to the department in the 2 years. However, the detailed data were available for only 22 patients, and these patients were treated in the department. Information regarding general identification, gender, and age at which the patient was operated for surgical resection of maxilla or diagnosis of the tumor, affected side and etiology, and the time lag between surgical resection and rehabilitation was recorded from the clinical records of the patients.

Conclusion: The finding of the study revealed a predominance of the males being more affected, with the predominance of the left side involvement over the right side, with most frequently involved the age group of 21–40 years, and the etiology revealed the predominance of carcinoma of the maxilla for its resection.

Keywords: Age groups, etiology, gender, maxillectomy, prospective study, side

INTRODUCTION

The loss of a part of the oral cavity is regarded as a debilitating misfortune. Surgical procedures involved in the removal of the tissues diseased with the oral cancer may result in the resection of a part of the maxilla or complete maxilla. Maxillectomy is defined as the removal of a part or all of the maxilla.^[1]

The rehabilitation of a patient undergone maxillectomy requires a prosthesis that provides with the optimum appearance and functional results. Few cross-sectional studies have evaluated the change in the quality of life in maxillectomy patients after obturator therapy. Ali *et al.*^[2] investigated the quality of life of patients with

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maxillectomy after rehabilitation with obturator prostheses in the Sudanese population and reported significant improvement by this noninvasive treatment modality. Omo *et al.*^[3] reported that majority of the obturators fabricated for patients with maxillary defect at a tertiary health institution in Nigeria were immediate surgical obturators and emphasized on presurgical patient education and proper follow-up care.

However, few studies have been published regarding the prevalence of maxillary defects related to palatal obturator prosthesis. Majority of them focus on the quality of life after rehabilitation with obturator. Thus, this study was planned to evaluate the incidence of the maxillectomy defects among different age groups, gender, side involved, and etiology. Such knowledge is essential as it allows hospitals, policy planning authorities, and nations to be equipped with data which help in the provision of quality care for proper management of such conditions.

MATERIALS AND METHODS

The study was conducted at the Department of Prosthodontics, King George’s Medical College. Institutional ethical clearance was obtained (Ref.code: 71ECM IIB IMR/P4), and informed consent was taken from all the participants before the commencement of the study This is a prospective study of maxillectomy defect cases which reported and were treated in the department over a period of 2 years (2015–2017). Information regarding general identification details, i.e., name, address, phone number, gender, and age at which the patient was operated for surgical resection of the maxilla or diagnosis of the tumor, affected side and etiology, and the time lag between surgical resection and rehabilitation was recorded from the clinical records of the patients.

Inclusion criteria

Patients only with maxillary defects, regardless of the cause of the defect, and willing to participate in the study were selected.

Exclusion criteria

Patients who were not willing for participation had any other defect of the oral cavity apart from maxillary defect were not involved.

Based on the side affected, it was classified as left and right.

Based on the etiology, it was categorized as follows:

1. Congenital (from birth)

2. Traumatic
3. Pathologic (infection, tumor, or any other pathology)
4. Unknown.

The recorded data were grouped according to different age groups, gender, side involved, and etiology. Descriptive analysis was done, and the frequency and percentage of the data collected were determined. Results were analyzed using SPSS software (version 20) (IBM Corp, Armonk, N.Y, USA) by a qualified statistician.

RESULTS

A total of 30 patients reported to the department in the 2 years. However, the detailed data were available for only 22 patients, and these patients were treated in the department. The evaluated data of 22 patients in the study revealed that maxillectomy defect was found to be more in the male population (81.81%) in comparison to the female population (18.18%) [Graph 1].

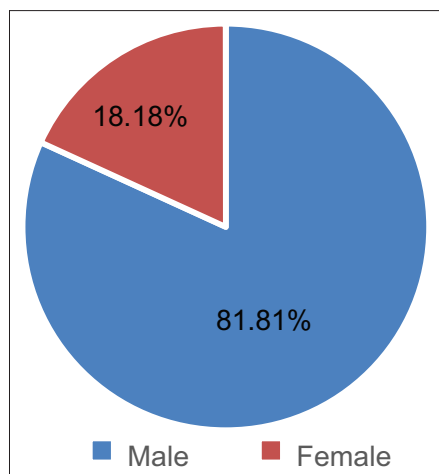
Regarding the prevalence in relation to the side involved, it was observed that the left side (68.18%) was involved more than the right side (31.81%) [Graph 2].

Patients between the age group of 21 and 40 years (45.4%) were the most involved, with equivalence to patients between the age group of 41 and 60 years, and the patients between 0 and 20 age group (4.5%) were least involved. The age group between 61 and 80 years showed a prevalence of 9.1% [Graph 3].

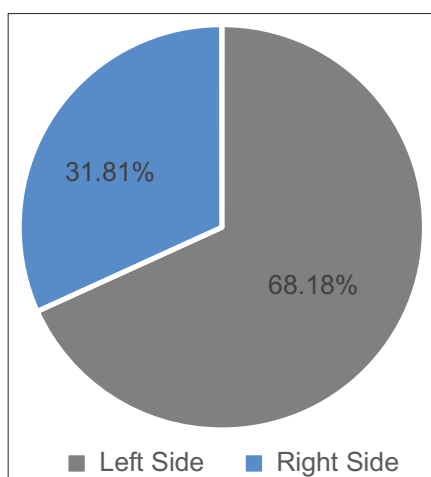
Etiological prevalence showed the predominance of malignant carcinoma of the maxilla (77.27%) compared to benign lesions (22.72%), traumatic injury, congenital,

Table 1: Distribution of patients

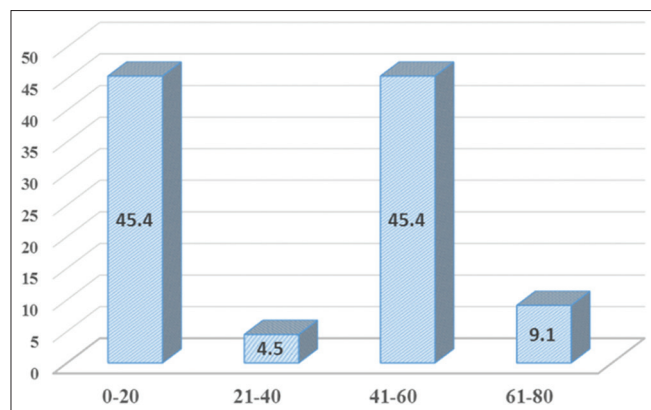
Variable	Percentage
Gender	
Male	81.81
Female	18.18
Age (years) (%)	
0-20	45.4
21-40	4.5
41-60	45.4
61-80	9.1
Side affected (%)	
Left	68.18
Right	31.81
Etiology	
Malignant (%)	77.3
Benign	22.7



Graph 1: Percentage of maxillectomy defects



Graph 2: Prevalence relation percentage



Graph 3: Prevalence percentage in different age groups

etc., Etiological prevalence showed the predominance of malignant carcinoma of maxilla(77.27%) compared to benign lesions(22.72%), traumatic injury, congenital, etc. with squamous cell carcinoma as the most prevalent malignant and ameloblastoma the most common benign lesion, followed by adenomatoid odontogenic tumor. [Table 1].

DISCUSSION

The finding of the study revealed a predominance of the males being more affected, with higher involvement of the left side over the right. The most frequently involved age group was 21–40 years, and the etiology revealed the predominance of carcinoma of the maxilla for its resection.

Malignancies constituted as the causative factor for maxillectomy in 72.7% of the patients recruited, with squamous cell carcinoma being the most frequent etiology. Mehanna and Smith.^[4] have reported that 90%–95% of malignant neoplasms of the oral cavity are oral squamous cell carcinomas. Considered as an adult disease, it is commonly associated with alcohol and tobacco consumption. Llewellyn *et al.*^[5] have stated a rising incidence of oral cancer in young males. They critically examined 46 publications devoted to oral cancer in the young adult and reported that 4%–6% of oral cancers now occur at ages younger than 40 years. Conflicting evidence was reported by them on the sex distribution in this younger age group. Emphasizing the need to study the risk factors, diagnostic and prognostic markers associated with this disease.

Most of the maxillary lesions remain asymptomatic for long periods making the diagnosis difficult in the initial stages. According to Jham *et al.*^[6] mostly, when the lesion has grown and involved the surrounding bone and tissues, it is diagnosed in its advanced form. Making resection most suited treatment option, along with radiotherapy.

Partial or a radical maxillectomy is mostly required for the resection of the tumors of the paranasal sinus, palatal epithelium, or minor salivary glands, and the amount of soft palate resected is variable depending on the site and extension of the tumor. Postsurgically, the patient is predisposed to hypernasal speech, fluid leakage into the nasal cavity, impaired masticatory function, and cosmetic deformity. Immediate rehabilitation with the prosthesis postsurgically minimizes or eliminates the oral disabilities associated with the maxillectomy. The palatal obturator by providing the missing teeth and properly supporting the upper lip and cheek aids in alleviating the deformity cosmetically.^[7]

Patients undergoing resection of the maxilla without an obturator prosthesis have deficits in speech, mastication and swallowing, foods and liquids escaping through the nasal cavity, and hypernasal speech. These speech and swallowing deficits resulting from a maxillectomy are greatly diminished by restoring with an obturator prosthesis.^[8]

The primary aim of the obturator prosthesis is to preserve the remaining teeth and tissue and provide comfort, function, and esthetics to the patients. The goals of prosthetic rehabilitation for total and partial maxillectomy patients include separation of oral and nasal cavities to allow adequate deglutition and articulation, possible support of the orbital contents to prevent enophthalmos and diplopia, soft tissue's support to restore midfacial contour, and acceptable esthetic results.^[9]

One of the commonly observed problems with maxillary obturators is difficulty retention of the prosthesis; thus, during the maxillary resection, if permissible, the surgeon should try to conserve the adjacent tissues without compromising on the oncological principles of removal of the lesion, which can aid in providing adequate support for the prosthesis.

In this study, 22 maxillectomy patients were delivered with surgical obturator during surgery, and it was found that most of these patients had improvement in speech, mastication, deglutition, and salivary control. However, these patients were not restored to presurgical levels because the communication between the nose and the oral cavity was obliterated to as far as maximum possible. During the postsurgical period, the patient could switch from the nasogastric route of feeding to the oral route of feeding.

The patients were educated and motivated to report back to the department for the fabrication of an interim obturator to be used after initial healing until the tissues are stabilized (approximately 3 months). An interim obturator is a prosthesis that bridges the gap between the immediate surgical obturator and the definitive obturator. Few of these patients were rehabilitated with interim palatal obturators which were maintained until the definitive obturator is constructed. Artificial replacement of the teeth and palate in the interim palatal obturator aided in speech, mastication, esthetics, and morale.^[10]

A definitive prosthesis is not indicated until the surgical site is healed and dimensionally stable, and the patient is physically and emotionally prepared for the restorative care that may be necessary.^[11]

Fabrication of an obturator requires a proper impression of the defect side. This allows the fabrication of a primary model cast on which the design of the prosthesis is finalized according to the defect size, remaining teeth, and tissues. Immediate surgical obturator of fabricated over this model itself. Whereas definitive obturator involves mouth preparation of the teeth to allow for a proper path

of placement and seating of the prosthesis, followed by secondary impression over which definitive obturator is fabricated either in heat-cure polymerizing resin, with or without metal (cobalt-chromium, titanium, etc.) framework.

Further, it was observed that the patients who were restored with interim obturator prosthesis were having great improvements to hypernasal speech, mastication, esthetics in relation to facial appearance, quality of life, and more self-confidence. de Carvalho-Teles *et al.*^[12] evaluated the efficacy of the palatal obturator prosthesis on speech intelligibility and resonance of 23 patients with age ranging from 18 to 83 years, who had undergone inframedial-structural maxillectomy. They reported that obturator prosthesis caused improvement in speech intelligibility in 82.6% of patients and 69.9% exhibited a reduction in hypernasality. They also stated that the success was limited by factors such as radiotherapy, the extent of maxillary surgery, and speech therapy. Emphasizing the importance of interdisciplinary management to improve rehabilitation and the quality of life of these patients. Dalkiz and Dalkiz^[13] studied patients with a maxillectomy defect and velopharyngeal insufficiency and were rehabilitated using an obturator. They concluded that when properly fabricated, obturators restore the anatomy and function of lost tissue.

It is required to conduct a larger sample-sized prospective longitudinal study in the future,^[14] for large scale data collection to equip our facilities for better management.

CONCLUSION

The study revealed a predominance of the males being more affected, with the predominance of the left side involvement over the right side, with the most frequently involved age group of 21–40 years, and the etiology revealed the predominance of carcinoma of the maxilla for its resection. Frequently, carcinoma of the maxillary region was the main cause for the resection of the maxilla following which the maxillary palatal obturator prosthesis was fabricated.

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Conflicts of interest

There are no conflicts of interest.

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