ORIGINAL ARTICLE

# Maxillary Sinus Tumours - A Review of Twenty-nine Patients Treated by Maxillectomy Approach

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**Summary**

A retrospective data of 29 patients who underwent various types of maxillectomy from January 1998 till January 2004 in UKM hospital were reviewed. There were 21 males (72%) and 8 females (28%) with mean age of 42 years. Malays were the majority of patients 17 (59%), Chinese 11 (38%) and Indian 1 (3%). Seventeen patients (59%) presented with malignant tumours while 12 patients (41%) with benign tumours. Inverted papilloma (50%) was the commonest benign tumour and squamous cell carcinoma (36%) was the commonest malignancy. Medial maxillectomy was performed in ten patients (35%), total maxillectomy in seven patients (24%), three patients (10%) had near total, three patients (10%) had partial maxillectomy and six patients (21%) underwent inferior maxillectomy.

*Key Words:* Maxillary sinus tumours, Maxillectomy

## Introduction

There are many surgical approaches in managing patients with maxillary sinus tumour. The surgical treatment has evolved from a simple excision to an en block resection which usually involves maxillectomy for an extensive tumour. The surgery is determined by the extent of the tumour and invasion of the neighbouring structures.

Surgical resection generally is preferred as primary treatment with post-operative radiation for adverse parameters. It is most recommended regime for curative purposes. Palliative excision may be considered for patients with intractable pain to provide rapid decompression of vital structures, or to debulk a massive lesion, thus freeing the patient from social embarrassment.

Early stage of maxillary sinus tumours can be removed via lateral rhinotomy and medial maxillectomy, inferior maxillectomy or wide local excision. The most common lesion resected by medial maxillectomy is inverted papilloma[1]. Inferior maxillectomy is indicated for tumours of the hard palate that have not or have only minimally penetrated the inside of the maxillary sinus. Larger tumours require partial resection, subtotal or total maxillectomy via midfacial degloving or Weber Ferguson incision. Tumour which has penetrated the periosteum of the orbit will require orbital exanteration[2], while tumours with intracranial extension require an anterior craniofacial resection.

Dental prosthesis or reconstruction with bone graft or vascularised flaps were used to obturate the defect[3]. The aim of this study is to perform a retrospective review of our experience in performing maxillectomy.

## Materials and Methods

We reviewed the hospital files of 29 patients with maxillary sinus tumour who underwent various types

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of maxillectomy procedure in HUKM from January 1998 till January 2004. Patients who underwent initial maxillectomy and then developed recurrences were excluded. Data on age, sex, race, common presenting symptoms, diagnoses, types of maxillectomy and incision used, placement of maxillary obturator and finally presence of recurrence were obtained.

## Results

Most of the patients were between second and fifth decades with mean age of 42 years. Male to female ratio was 3:1. Racial proportion was 17 Malays (59%), 11 Chinese (38%) and 1 Indian (3%). The most common symptom was cheek swelling (51%), followed by nasal obstruction (34%). Other symptoms were epistaxis (10%) and loose teeth (5%).

Seventeen patients (59%) had malignant tumours and 12 patients (41%) had benign tumours (Figure 1). The most common benign tumour of the maxillary sinus in this study was inverted papilloma constituting about 50%. Other tumours were ameloblastoma (25%), angiofibroma (8%), maxillary haemangioma (8%) and calcifying epithelial odontogenic tumour (8%).

Squamous cell carcinoma (35%) remains the commonest malignancy in this study followed by sinonasal undifferentiated carcinoma (24%). Other malignant tumours were osteosarcoma (18%), adenoid cystic carcinoma (6%), mucoepidermoid carcinoma (6%), fibrosarcoma (6%) and malignant ameloblastoma (6%).

The surgical approach depends on the type and staging of the tumour. Medial maxillectomy was the most common procedure (35%) followed by total maxillectomy (24%) (Figure 2). It was carried out either by lateral rhinotomy or Weber Ferguson incision. Rehabilitation of the patient with dental obturator was carried out in 59% of the patients. Recurrence was shown in 17% of patients with benign tumours while 59% involved malignant tumours (Figure 3).

## Discussion

Sinonasal neoplasms are rare, constitute less than 1% of all the malignancies in the body and about 3% in the aerodigestive tract[4]. In the United States, the incidence was 0.3 to one per 100 000 of the population, being rare in the young but increasing with age by the eight decade (five to seven per 100 000)[5]. Maxillary sinus was the most commonly involved site (55% to 63%), followed by nasal walls (27% to 35%), ethmoid (9% to 10%) and frontal and sphenoidal sinuses (1% to 2% each)[4].

Tumours in these areas are both therapeutically and diagnostically challenging; in view of their initial presenting symptoms which are often similar between the benign and malignant tumours.

Men were affected more than women with a ratio of 2:1[6]. In our study, the male to female ratio was 3:1. Malignant tumours of the sinonasal tract typically affect the Caucasian males in the fifth to seven decades of life[7]. However, in our study, Malays and Chinese were

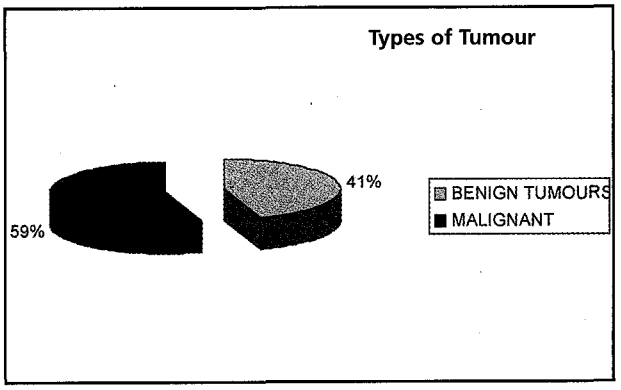


**Fig. 1: Distribution of types of tumour**

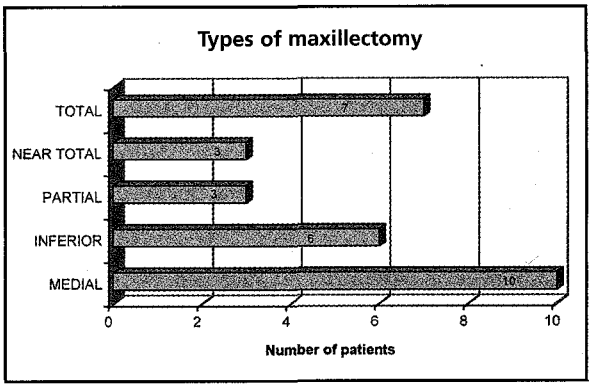


**Fig. 2: Types of maxillectomy**

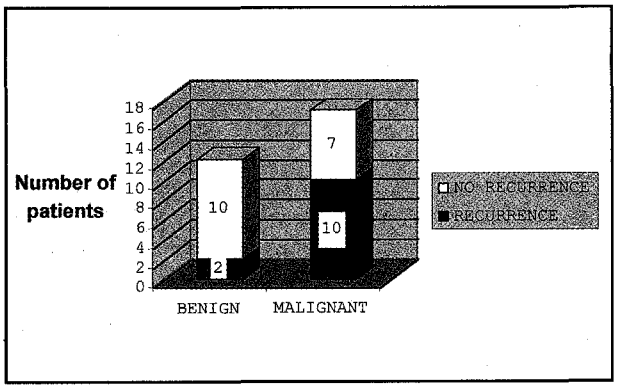


**Fig. 3: Distribution of patient who develop recurrence**

commonly involved and they were in the age group from 14 to 70 years, with the mean age of 42 years old.

Symptoms of tumours of the paranasal sinuses usually develop late. Patients who do not respond to medical treatment for their sinonasal symptoms should be investigated for malignancies. In general, signs and symptoms of maxillary sinus carcinoma can be divided into several major categories: oral, nasal, ocular, facial and auditory. Oral presentations occur in 25-35% of patients[8] and include pain involving the maxillary dentition, trismus, palatal and alveolar ridge fullness and frank erosion into the oral cavity. In our patients, only 10% presented with oral symptoms (loose teeth or ulcer). Nasal findings such as persistent sinusitis, unilateral nasal obstruction, nasal discharge and epistaxis were seen in about 50% of patients[8]. Fifty-two percent of our patients presented with nasal obstruction with or without epistaxis. Ocular findings occur in approximately 25%[8] and arise from upward extension into the orbit such as unilateral tearing, diplopia, fullness of lids, pain and exopthalmos. None of our patients presented with ocular symptom. However, most of them complaint of cheek swelling (41%). Other facial signs that may present include infraorbital nerve hyperaesthesia, pain and facial asymmetry. Auditory complaints include hearing impairment secondary to serous otitis media due to nasopharyngeal extension. Intracranial extension may lead to headache, mental status or personality changes (frontal lobe involvement).

Radiographic evaluation is essential, as the full extent of a sinonasal neoplasm cannot be established even with modern fibreoptic technology. Computed tomography (CT) of the paranasal sinuses with contrast is therefore, compulsory for initial assessment of sinus malignancies. Magnetic resonance imaging (MRI) provides an excellent delineation of the tumour from surrounding inflammatory tissue and secretions within the sinuses. In our series, all the patients had CT scan of paranasal sinus or MRI. The factors that determine the extent of surgical approach to the paranasal sinuses neoplasm include the histology, size and location of the tumour in relation to the orbits, skull base and internal carotid artery.

In our study, 45% of patients were diagnosed to have benign tumours of the sinonasal tract, of which 50% were inverted papilloma. Woodson GE *et al* 1985[9] considered medial maxillectomy as the best approach for tumour removal in patients with inverted papilloma that extends into the maxillary sinus.

Dental obturator were applied in the patients who had inferior and total maxillectomy. In our series about 59% patients has prosthetic rehabilitation with obturators.

Maxillary sinus carcinoma comprises about 59% in this study. The commonest malignancy found was squamous cell carcinoma (SCC) 35%. Squamous cell carcinoma was the commonest reported tumour affecting the maxillary and ethmoid sinuses[6]. More than 90% will have invaded through at least one wall of the involved sinus when discovered. Combination of resection of the tumour and neck dissection is the rule of thumb in the management of this malignancy. The second most common malignancy was the sinonasal undifferentiated carcinoma (SNUC) 24%.

Our study also showed a case of adenoid cystic carcinoma of the left maxilla. This malignancy commonly involves the major and minor salivary glands of the oral cavity. Paranasal sinus involvement was shown to comprise only 14-17% of all cases[10]. This patient had partial maxillectomy combined with craniofacial resection due to the presence of intracranial extension. The aggressive surgical resection was uneventful and she had no signs of recurrence after three years post operatively. However, this patient requires regular long term follow up as perineural spread along the cranial nerves is believed to be responsible for the high rates of local recurrence.

## Conclusion

We concluded that surgical approach should be chosen carefully. This is determined by type of the tumour, the

extent of the tumor and involvement of the neighbouring structures. Maxillectomy itself is a safe surgical approach in managing maxillary sinus tumours either benign or malignant group.

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