Oral and maxillofacial tumours surgically treated at Muhimbili National Hospital, Dar es salaam, Tanzania: experience over 5 years.

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Abstract

Bacground: Tumours that affect the oral and maxillofacial region originate from odontogenic or non odontogenic tissues. They possess varying clinical and histopathological characteristics based upon which they are regarded as either benign or malignant.
Objective: To report on the demographic, diagnosis, treatment and prognosis of oral and maxillofacial tumours surgically treated at Muhimbili National Hospital (MNH), Dar es Salaam, over a five year period.
Methodology: For every patient demographic data (i.e. age, sex, address and occupation), histopathological diagnosis, duration of the disease and the details of the treatment procedure done were recorded in a special form. Treatment details included the type of surgery i.e. enucleation, excision or resection with or without reconstruction. The patients were recalled for assessment of their conditions postoperatively at three, six and twelve months interval. Data was entered into computer using the Epi-info programme. Statistical analysis for significance was calculated with $p \leq 0.05$..
Results: A total of 148 patients, 60 (40.5%) males and 88 (59.5%) females aged between 6 and 70 years with a mean of 25.8 years (SD = 16.4) were included in the study. Ameloblastoma was the commonest tumour encountered in 46 (31.0%) patients, followed by ossifying fibroma 19 (12.8%) and pleomorphic adenoma in 20 (13.5%) patients. Other tumours in this group of patients included giant cell tumour in 11 (7.4%) patients, myxoma 10 (6.8%), fibrous dysplasia 9 (6.1%) and haemangioma in 7 (4.7%) patients. Twenty-six (17.6%) patients had tumours that appeared with very low frequencies therefore, these were grouped together as others. The surgical approaches differed according to histological types and clinical characteristics of the tumours. Except for two patients with ameloblastoma who got infection, all surgical wounds healed uneventfully.
Conclusion: Ameloblastoma was the commonest encountered tumour in this group of patients. Majority of the patients presented rather late with massive tumours that needed ablative surgery. A national programme focusing on early detection and definitive treatment of these tumours, including health education addressed to the public, general and oral health professionals is important

Introduction

Tumours that affect the oral and maxillofacial region originate from odontogenic or non odontogenic tissues.[1, 2, 3,4] They possess varying clinical and histopathological characteristics based upon which they are regarded as either benign or malignant.[5] An understanding of biological behaviour of the various neoplasms occurring in this region is fundamental to the overall management plan. Thus, in order to institute the appropriate management, it is absolutely necessary to establish the histological diagnosis.[7] Some of these tumours, although histologically benign, are actually aggressive in behaviour. In such cases therefore, to avoid recurrence it is imperative that during surgery clearance with a wide margin of normal tissue should be carried out.

There are many studies of large series of oral and maxillofacial tumours in the world.[1,3,5,,8] The Tanzanian situation is unique in the sense that, the country is faced by many challenges but has meagre resources. Even with the renewed efforts by the government to improve the health of its people through mass education and provision of facilities, still patients report late for the treatment of primary tumours or recurrences. This is further aggravated by the lack of or erratic follow up after surgery due to non-compliance by the patients. The purpose of this study was to report on the demographic, diagnosis, treatment and prognosis of oral and maxillofacial tumours surgically treated at MNH, Dar es Salaam, over a five year period.

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Materials and methods

During the five-year period from July 2002 to June 2007, all patients who underwent surgical treatment for oral and maxillofacial tumours at the Department of Oral and Maxillofacial Surgery of the MNH were enrolled in the study. All patients whose diagnoses were histologically confirmed were surgically treated. For every patient the demographic data (i.e. age, sex, address and occupation), clinical presentation, duration and details of the treatment procedure were recorded in a special form. Treatment details included type of surgery i.e. enucleation, excision or resection with or without reconstruction. The patients were recalled for assessment of their conditions postoperatively at three, six and twelve months interval. Data was entered into computer using the Epi-info programme. Statistical analysis for significance was calculated with $p \leq 0.05$.

Results

A total of one hundred and forty eight patients, sixty (40.5%) males and eighty eight (59.5%) females with a male to female ratio of 0.7:1 were treated. The age range was 6 years to 70 years with a mean of 25.8 years (SD = 16.4). Ameloblastoma was the commonest tumour encountered in 46 (31.0%) patients, followed by ossifying fibroma (OF) 19 (12.8%) and pleomorphic adenoma in 20 (13.5%) patients. Other tumours in this group of patients included giant cell tumour in 11 (7.4%) patients, myxoma 10 (6.8%), fibrous dysplasia (FD) 9 (6.1%) and haemangioma in 7 (4.7%) patients. Twenty-six (17.6%) patients had tumours that appeared with very low frequencies, therefore, they were grouped together as others (Table 1).

The male to female ratio per histological diagnosis among the treated patients was as follows: ameloblastoma 1:1.5, OF 1:2, pleomorphic adenoma 1:1.2, giant cell tumour 1:3, myxoma 1:1.5, fibrous dysplasia 1:2 and haemangioma 1:0.4. The peak age group of occurrence of oro facial tumours was 21-30 years, which consisted of 47 (31.8%) patients followed by the second decade (11-20 years) with 36 (24.3%) patients (Table 2).

The mandible was the most affected bone in 82 (55.4%) patients compared to the maxilla in 33 (22.3%) patients ($p < 0.05$). These were followed by the palate in 13 (8.8%) patients. Other affected sites included the parotid gland in 6 (4.0%) patients, submandibular gland 4 (2.7%), cheek 3 (2.0%) and upper lip in 3 (2.0%) patients. Lower lip and tongue were equally affected each with 2

(1.4%) patients (Table 3). Only 3 (6.5%) out of 46 patients with ameloblastoma presented in the first one year after onset while 19 (41.3%) patients presented after 1-3 years, 17 (36.9%) 4-7 years, 5 (10.9%) 8-11 years and 2 (4.3%) after 12 years. Thirteen (68.4%) patients with ossifying fibroma, 8 (40%) with pleomorphic adenoma, 5 (45.5%) with giant cell tumour and 5 (50%) with myxoma presented between 1-3 years after onset. About half of the patients with giant cell tumour presented during the first one year. Four (44.4%) patients with fibrous dysplasia and 3 (42.9%) patients among those with haemangioma presented 12 or more years after onset. The other tumours presented between 1 and 11 years (Table 4). The majority of patients with ameloblastoma were treated by hemimandibulectomy 18 (39.1%), followed by partial mandibulectomy 10 (21.7%), total mandibulectomy 7 (15.2%) and marginal resection 6 (13%). All 3 (6.5%) patients with ameloblastoma of the maxilla underwent hemimaxillectomy. Only 2 (4.3%) patients were treated by partial mandibulectomy and reconstruction. Patients with haemangioma, pleomorphic adenoma and giant cell tumour were treated conservatively by tumour excision. Eighteen (94.7%) out of nineteen patients with OF were treated by conservative tumour excision while one was treated by hemimaxillectomy. Nine patients with FD were treated by bone remodelling. Majority, 8 (80%) patients with myxoma had conservative tumour excision but the other two had hemimaxillectomy and hemimandibulectomy. Except for two ameloblastoma patients who got infection, all the surgical wounds healed uneventfully.

Table 1: Distribution of patients by histological diagnosis and sex

SN	Diagnosis	No of patient	%	Sex		Sex ratio
				M	F	M: F
1.	Ameloblastoma	46	31.0	18	28	1:1.5
2	Ossifying fibroma	19	12.8	6	13	1:2.7
3	Pleomorphic adenoma	20	13.5	9	11	1:1.2
4	Giant cell tumour	11	7.43	3	8	1:2.2
5	Myxoma	10	6.8	4	6	1: 1.5
6	Fibrous dysplasia	9	6.1	3	6	1:2
7	Haemangioma	7	4.7	5	2	1:0.4
8	Epulis	1	0.67	1	-	M
9	Odontoma	2	1.4	-	2	F
10	Reactive histiocytoma	1	0.67	-	1	F
11	Lipoma	2	1.4	-	2	F
12	Lymphangioma	1	0.67	1	-	M
13	Burkitt's lymphoma	1	0.67	-	1	F
14	Fibroma	1	0.67	1	-	M
15	Liposarcoma	1	0.67	1	-	M
16	Chondrosarcoma	1	0.67	-	1	F
17	Osteosarcoma	1	0.67	1	-	M
18	Calcifying epithelial odontogenic tumour	1	0.67	1	-	M
19	Fibromyxoma	1	0.67	1	-	M
20	Squamous cell carcinoma	2	1.4	-	2	F
21	Fibrosarcoma	1	0.67	1	-	M
22	Pyogenic granuloma	2	1.4	1	1	1: 1
23	Adenoid cystic carcinoma	1	0.67	1	-	M
24	Mucoepidermoid carcinoma	1	0.67	1	-	M
25	Adeno carcinoma	1	0.67	-	1	F
26	Oncocytoma	1	0.67	1	-	M
27	Fibrous histiocytoma	1	0.67	-	1	F
28	Neurofibroma	1	0.67	-	1	F
29	Keratocyst	1	0.67	-	1	F
Total		**148**	**100**	**60**	**88**	**0.7:1**

Table 2: Distribution of orofacial tumours by age and sex

Diagnosis		Age group (years)							
		0-10	11-20	21-30	31-40	41-50	51-60	≥61	Total
Ameloblastoma	M	1	5	6	2	2	1	1	18
	F	-	2	14	7	2	3	-	28
Pleomorphic adenoma	M	-	2	2	2	1	1	-	9
	F	-	3	3	1	2	1	2	11
Ossifying fibroma	M	1	3	1	1	-	-	-	6
	F	-	2	8	1	1	-	1	13
Giant cell tumour	M	-	3	-	-	-	-	-	3
	F	2	2	1	-	1	1	1	8
Myxoma	M	-	2	1	1	-	-	-	4
	F	-	2	-	-	3	1	-	6
Fibrous dysplasia	M	-	-	2	1	-	-	-	3
	F	-	3	2	-	1	-	-	6
Hemangioma	M	-	2	2	-	1	-	-	5
	F	1	1	-	-	-	-	-	2
Others	M	1	3	1	3	1	3	-	12
	F	2	1	4	5	1	1	-	14
Total	M	8	36	47	24	16	12	5	148

Table 3: Distribution of orofacial tumours by site

Type of Tumour	Site									Total
	Maxilla	Mandible	Palate	Upper lip	Lower lip	Tongue	Cheek	Parotid gl.	Submandibular gl.	
Ameloblastoma	3	43	-	-	-	-	-	-	-	46
Pleomorphic adenoma	-	-	11	-	-	-	-	6	3	20
Ossifying fibroma	7	12	-	-	-	-	-	-	-	19
Giant cell tumour	5	6	-	-	-	-	-	-	-	11
Myxoma	4	6	-	-	-	-	-	-	-	10
Fibrous dysplasia	7	2	-	-	-	-	-	-	-	9
Haemangioma	-	1	-	2	1	1	2	-	-	7
Others	7	12	2	1	1	1	1	-	1	26
Total	33	82	13	3	2	2	3	6	4	148

Table 4: Duration of orofacial tumours before treatment

Tumour type	Duration (years)					
	< 1	1-3	4-7	8-11	≥12	Total
Ameloblastoma	3	19	17	5	2	46
Ossifying fibroma	1	13	2	1	2	19
Pleomorphic adenoma	2	8	4	3	3	20
Giant Cell tumour	5	5	1	-	-	11
Myxoma	1	5	2	1	1	10
Fibrous dysplasia	1	1	3	4	-	9
Haemangioma	1	1	1	1	3	7
Others	9	9	6	2	-	26
Total	23 (15.5%0	61 (41.2%)	36 (24.3%)	17 (11.5%)	11 (7.4%)	148 (100%)

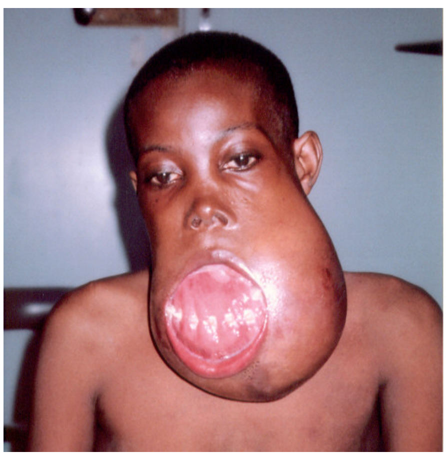

Figure 1. A 23 years old female patient with a huge ameloblastoma of the mandible that necessitated a total mandibulectomy

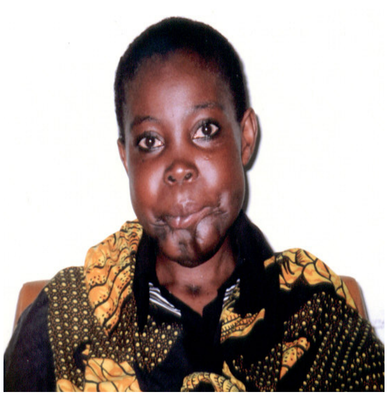

Figure 2. Patient in Fig 1 three months after total mandibulectomy

Discussion

This was a hospital-based study. Limitations of such studies include the fact that for variable reasons not all patients with orofacial tumours report for medical care. It is possible that some patients might not have reported to any health facility for various reasons, some might not have complied with referrals from primary centres and others might have failed to undergo the appropriate investigation. However, this was the selected sampling method considering that for most tumours the reliable means of diagnosis was through radiological and histological examination. The results of this clinical study showed that ameloblastoma was the commonest tumour among oral and maxillofacial patients managed at the MNH. This is in agreement with available reports from epidemiological studies.[1,2,3,4] The predilection of ameloblastoma for the mandible correlated well with other studies[3,7] (Table 3). This seems to be a scientific enigma considering the fact that both jaws have same number of teeth and yet maxillary ameloblastomas are a rarity. On the other hand, however, considering the complicated anatomy of the maxilla, the infiltrative nature of ameloblastoma, the significant challenges of surgery in this region and the tendency of our patients to report late with massive tumours (Fig 1). This rarity seems to give an advantage to the profession.

The reasons given by the majority for the late presentation observed in this study were mainly related to ignorance and poverty. The biological behaviour of ameloblastoma (i.e. slow and painless growth) might be the main reason why patients stayed for a long time without seeking medical attention. The same reasons could explain why ameloblastoma was found in almost all age groups (Table 2).

The treatment for ameloblastoma was variable; critically taking into consideration the clinical presentation, patient's age and extension of the tumour.

Because of late presentation, the majority of patients were treated with wide resection that included hemimandibulectomy, hemimaxillectomy and total mandibulectomy (Fig 2). Similar to recommendations by Gortzak et al. (2006), a margin of not less than 1 cm of healthy bone was removed together with the tumour(7). Where the overlying mucosa was attached to the tumour it was excised with the tumour. Big tumours resulted in wide resections that left behind big losses of tissue necessitating reconstruction to improve the quality of life. In seven patients total mandibulectomy was inevitable (Fig 2).

OF and FD were the second and sixth commonest orofacial tumours respectively in this study. The male:female ratios of [1:2.2] for OF and (1:2) for FD as revealed in this study were similar to studies done elsewhere(9,10,11). The current study showed that in patients with fibroosseous lesions (FOLS) generally the mandible was more commonly affected than the maxilla. However, between the two lesions, OF tended to occur more commonly in the mandible while FD occurred more commonly in the maxilla. The reason for this distribution is not known. It has been speculated that the anatomic and functional heterogeneity within individual bone units could be the reason for this distribution.(9,10)

The mode of treatment was enucleation for OF and remodelling for FD. Although conservative management is recommended for OF, hemimaxillectomy had to be done in one case because of extensive bone destruction by the tumour. No recurrences were noted following treatment of OF and only one patient with FD reported back with a recurrence that necessitated a second remodelling. The reason for the recurrence was not clear since, like all other FD cases, was subjected to surgery well beyond puberty.

The age of patients presenting with odontogenic myxoma ranged from 10 to 50 years. In concurrence with other studies the mandible was most commonly affected compared to the maxilla.(12,13,14) The treatment was radical surgery entailing excision with a margin of not less than 1.5 centimetres to minimize the possibility of recurrence. It was challenging to treat myxomas of the maxilla because of the tendency to invade the surrounding tissues. Sometimes such tumour location necessitated hemimaxillectomy as it was evidenced in one patient in this study. Nevertheless, no recurrence was encountered.

The peak age of occurrence of giant cell tumour was in the second decade of life. There was a possibility however, that some cases of giant cell tumours were misdiagnosed as central giant cell granulomas since the peak age of occurrence of the two is almost the same. Some researchers have considered the giant cell tumour of bone to be a representative of the biologically more aggressive variant of the central giant cell granuloma(15). The treatment of the two lesions was conservative surgical excision.

Haemangioma showed a peak incidence of occurrence in the 11-20 years age group. All haemangiomas seen were located in the soft tissues. Because so far, there is no one definitive method for treating haemangioma, different methods that include surgery, radiation therapy, sclerosing agents, cryotherapy and presurgical embolization techniques are used. We treated small and medium sized haemangiomas successfully by first injecting sclerosing agents, followed by surgical excision. Success of this treatment mostly depended on good case selection; considering the location, extension and size of lesions.

Salivary gland tumours occurred almost equally between males and females [M: F 1:1.2]. Pleomorphic adenoma was the third commonest tumour and mostly arouse from intraoral minor salivary glands of the palate. This was contrary to other studies in which pleomorphic adenoma accounted for 90% of benign parotid tumours and 50% of all submandibular gland tumours.(16) Treatment offered to these patients was total surgical excision of the tumour and no recurrences were encountered. The few malignant salivary gland tumours were treated by surgical excision followed by adjuvant radiotherapy. Despite this combination the prognosis of these patients was generally very poor.

In our situation, where patients have a tendency to report late with advanced lesions, invasion and adherence to soft tissues was one of the factors complicating surgeries. Big tumours compromised function and aesthetics and due to trauma from chewing they were often predisposed to serious infection, which was difficult to control. In such situations there was need to thoroughly cleanse the surgical wounds with copious amounts of antiseptics after tumour excision before closure. Weak hydrogen peroxide (3%) followed by normal saline was used in such situation with great success. Intravenous ciproflaxin,

1 gm stat or ampicillin/amoxicillin were used in the immediate preoperative period in all patients with big tumours. In all operated cases antibiotics were continued for the first 5 days. Extension of antibiotic use beyond five days was determined according to individual patients' condition. Corrugated rubber drainage was usually inserted for the first 48 hours postoperative.

Except for two ameloblastoma patients who got infection, all the surgical wounds healed uneventfully. The infection in the two cases however, was ultimately controlled. The use of preoperative antibiotics for all patients, and intraoperative antibiotics in big tumours, that were maintained for at least seven days post operatively could be the main reason for the few cases of postoperative infection. A considerable number of patients needed prolonged stay in hospital to stabilize their general conditions before definitive treatment i.e. surgery could be performed. Anaemia and infections were among the most common complicating factors on patients' arrival in hospital.

In conclusion, ameloblastoma was the commonest tumour in this group of patients. Majority of the patients presented rather late with massive tumours that needed ablative surgery resulting in facial disfigurement and poor quality of life. A national programme focusing on early detection and definitive treatment of these tumours, including health education addressed to the public, general and oral health professionals is important.

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References

1. AL-Khateeb T, AL-Hadi A, Hamasha A, Almasri NM. Oral and maxillofacial tumours in north Jordanian children and adolescents: a retrospective analysis over 10 years. International Journal of Oral Maxillofacial and Surgery 2003;32:78-83.
2. Olaitan PB, Jiburum BC, Onuigbo WIB. Clinicopathological features of jaw tumours. Indian Journal of Medical and Paediatric Oncology 2005;26:12-17.
3. Simon ENM, Merkx MAW, Vuhahula E, Ngassapa D,. A 4-year prospective study on epidemiology and clinicopathological presentation of odontogenic tumours in Tanzania. Oral Surgery Oral Medicine Oral Pathology Oral Radiology and Endodontics 2005;99:598-602.
4. Adebayo ET, Ajike SO, Adekeye EM. Odontogenic tumours in children and adolescents: a study of 78 Nigerian cases. Journal of Craniofacial Surgery 2002;30:267-272.
5. Fernandes AM, Duarte ECB, Pimenta FJGS, Souza LN, Santos VR, Mesquita RA, Ferreira de Aquiar MC. Odontogenic tumours: a study of 340 cases in a Brazilian population. Oral Pathology and Medicine 2005;34:583-587.
6. Kramer IRH, Pindborg JJ, Shear M. WHO Histologic Typing of Odontogenic Tumours. Berlin: Springer-Verlag 1992:7-9.
7. Gortzak RA, Latief BS, Lekkas C, Slootweg PJ. Growth characteristics of large mandibular ameloblstomas: report of 5 cases with implications for the approach to surgery. International Journal of Oral and Maxillofacial Surgery 2006;35:691-695.
8. Ochsenius G, Ortega A, Godoy L, Penafiel C, Escobar E. Odontogenic tumours in Chile. Journal of Oral Pathology and Medicine 2002;31:415-420.
9. Hamner JE, Scofield HH, Cornyn J: Benign fibro-osseous jaw lesions of periodontal membrane origin. An analysis of 249 cases. Cancer 19868,22:861-878
10. Lan Su, Dwight RW, Waldoon CA: Distinguishing features of focal cemento-osseous dysplasia and cemento-ossfying fibromas II. A clinical and radiographic spectrum of 316 cases. Oral Surgery, Oral Medicine, Oral Pathology and Endodontics 1977; 84:540-549.
11. Longdon JD, Rapidis AD, Patel MF: Ossifying fibroma-lesions of the jaws. British Journal of Oral Surgery 1976;14:1-11
12. Simon ENM, Merkx MAW, Vuhahula E, Ngassapa D, Stoelinga PJW: Odontogenic myxoma: a clinicopathological study of 33 cases. Oral Surgery, Oral Medicine, Oral Pathology Oral Radiology and Endodontics 2004;33:333-337.
13. Muzio LL, Nocin P, Favia G, Proccacin M, Mignogna MD: Odontogenic myxoma of the jaws. A clinicoradiologic immunohistochemical and ultrastructural study. Oral Surgery. 1996;82:426-433
14. Butt FMA, Chindia ML, Wokoli KA: Problem in diagnosing odontogenic myxoma: Case report; East African Medical Journal 2007;84:141-145.
15. Regezi JA, Scubba JJ. A textbook of oral pathology. Clinical pathologic correlations, 3rd ED. Philadelphia, W.B. Sounders, 1999;pp 323-350.
16. Jansisyanant P, Blanchaert RH, Robert A Jr.: Intraoral minor salivary gland neoplasms: A single institution experience of 80 cases. International Journal of Oral and Maxillofacial Surgery 2002;31:257-261.