

Original Article

Pattern of Maxillofacial Surgical Conditions in North Central Nigeria: A 5-year Experience of an Indigenous Surgical Mission

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INTRODUCTION

Oral and maxillofacial, orofacial, craniofacial, and sometimes head and neck diseases are some of the terminologies that have been used to describe diseases affecting the mouth and perioral tissues. The spectrum of oral and maxillofacial diseases includes infectious disease, traumatic injuries, neoplastic and developmental diseases, cysts, and congenital defects.^[1,2] Epidemiological studies on oral health will enhance understanding of predominant oral health problems which will in turn inform appropriate local policies and prioritizing the health planning and public dental education.^[1] Several studies have examined the

ABSTRACT

Background: Several publications have presented pattern of maxillofacial surgical conditions based on data from hospital-based studies. The objective of this study is to present the spectrum of maxillofacial surgical conditions from the perspective of a community study. **Methods:** This is a prospective study of all patients seen and treated from 2011 to 2016. The information obtained included the biodata, clinical history of the disease conditions, radiological result, histopathologic result, diagnosis, and treatment records. Data analysis was carried out using SPSS version 20.0. **Results:** There was a total of 863 patients, male 464 (53.8%) and female 399 (46.2%). The male to female sex ratio was 1.16:1. The age range was 3 days to 76 years with a mean age (SD) 16.8 ± 15.8 years. The spectrum of surgical conditions: facial clefts 492(57.0%); tumor and tumor-like lesions 126(15.2%), trauma 6(0.7%), and others 48(5.5 %). The size of tumors ranged from 5 to 50.4 cm² with a mean (SD) 21.6 ± 11.9 cm² and the duration of lesion ranged from 1 to 20 years with mean (SD) 8.7 ± 6.0 years. A total of 622(77.4) cases were operated within the study period with immediate jaw reconstruction in 5(0.8%) patients. Minor complications were recorded but there was no mortality. **Conclusion:** The spectrum of maxillofacial surgery from community-based data was associated with higher percentage of facial cleft as compared to hospital-based study that is associated with higher traumatic injury cases. High level of poverty, ignorance, and poor access to maxillofacial service have been identified as shortcomings in the management of the diseases. There is a need for pragmatic move to improve facility, training, enlightenment, and more funding of outreach programs.

KEYWORDS: *Indigenous surgical mission, maxillofacial surgical conditions, North Central Nigeria*

epidemiology of orofacial diseases. Although many studies examined the pattern of distribution of specific member of the spectrum such as odontogenic tumor,^[3-7] trauma,^[8,9] temporomandibular joint (TMJ),^[10,11] few others studied the total spectrum in specific locations of Nigeria.^[1,2,12-14] One thing common to all the studies is that they are hospital based. The aim of this study is to describe the pattern of oral and maxillofacial surgical conditions as seen at surgical outreach

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programs in different locations of the North central zone of Nigeria.

MATERIALS AND METHODS

This was a prospective cross-sectional study of patients seen at various outreach program locations in North Central Nigeria between 2011 and 2016. Cleft and Facial Deformity Foundation (CFDF) is an indigenous surgical mission that provides free surgical care for patients with orofacial diseases. Comprehensive information was obtained from patients through a standard patients' case file. The information obtained included the bio data, history of the disease conditions, and description at presentation, diagnosis as agreed by at least two surgeons and histology report where applicable. Others included form of anesthesia and any important information during the surgery and follow-up period. A written consent was obtained from the patients for the use of their photographs for educational purposes. The size of tumors was determined by approximate measurement of the greatest length and breadth of the lesion, using a measuring tape, and finding the area in centimeters. Duration of lesions was determined by the time elapsed from the onset of lesion to the time of presentation. All patients with diagnosis of orofacial diseases were included, whereas lesions located outside the head and neck region were excluded. Data obtained from the study were analyzed using Statistical Package for Social Sciences (SPSS) version 20.0. Descriptive statistics such as frequencies, mean, and standard deviation were used in the analysis of the data.

RESULTS

The organization carried out 15 outreach programs in the 5 years period, as covered by the report. There were a

Table 1: Age Presentation of patients seen and treated over 5 years at Outreach programmes in North Central Zone of Nigeria.

Age Range	Frequency	Percent
0 - 5	288	33.4
6 - 10	100	11.6
11 - 15	82	9.5
16 - 20	85	9.9
21 - 25	65	7.5
26 - 30	79	9.2
31 - 35	52	6.0
36 - 40	37	4.3
41 - 45	21	2.4
46 - 50	24	2.8
>50	29	3.4
Total	863	100

Table 2: Profile of orofacial surgical conditions seen and treated over 5 years during outreach programmes in North Central zone of Nigeria.

Lesions	Frequency	Percentage
Facial cleft	492	57.0
Noma	52	6.0
Tmj ankylosis	18	2.1
Carcinoma	3	0.3
Ameloblastoma	37	4.3
Fibrous lesion	32	3.7
Odontogenic cyst	28	3.2
Non odontogenic cyst	32	3.8
Vascular malformation	25	2.9
Lip hypertrophy	9	1.0
Keloid	42	4.9
Ankyloglossia	16	1.8
Salivary gland lesions	13	1.5
Trauma	6	0.7
Lipoma	10	1.2
Others	48	5.6
Total	863	100

Table 3: Pattern of facial cleft seen over 5 years at Outreach Programmes in North Central Nigeria.

Type of Cleft	Frequency	Percentage
Right Cleft Lip	113	23.0
Left Cleft Lip	162	32.9
Bilateral Cleft lip	32	6.5
Right Complete cleft Lip and Palate	29	5.9
Left Complete cleft Lip and Palate	32	6.5
Bilateral complete cleft Lip and Palate	40	8.1
Cleft Palate (Isolated)	57	11.6
Atypical Cleft (Tessier Classification)	27	5.5
Total	492	100

Table 4: Pattern of Presentation of TMJ Ankylosis Patients seen at Outreach Programmes over 5 years in North Central Zone of Nigeria

Factors	Variables	Freq	Percentage
Sex	Male	13	72.2
	Female	5	27.8
Aetiology	Trauma	4	22.2
	Ear infection	7	38.9
	Noma	2	11.1
	Congenital/unknown	3	16.6
	Burn	1	5.6
Location	cerebral convulsion in childhood	1	5.6
	Right	4	22.2
	Left	4	22.2
	Bilateral	10	55.6

total of 863 patients, of which male were 464 (53.8%) and female were 399 (46.2%). The male to female sex ratio was 1.16:1. The age range was 3 days to 76 years with a mean age (SD) 16.8 ± 15.8 years. Table 1 shows the age range distribution of the patients seen during the study period. A total of 288 (33.4%) patients were in the age range of 0–5 years, 167 (19.3%) patients in the range of 11–20 years, while 29 (2.6%) were above 50 years. A total of 388 (45.0%) of the patients were less than 10 years.

Table 2 shows the distribution of different surgical conditions recorded during the study: facial clefts 492 (57.0%); tumor and tumor-like lesions 132(15.3%); trauma 6(0.7%); and others 48(5.6 %). These include neurofibroma, lymphadenitis, maxillary sinusitis, and submandibular lymphadenitis. The size of tumors ranged from 5 to 50.4 cm² with a mean (SD) 21.6 ± 11.9 cm². The duration of lesion ranged from 1 to 20 years with mean (SD) 8.7 ± 6.0 years. The jaw distribution of tumor and tumor-like lesions is 57 (45.2%) in the maxilla and 69 (54.8%) in the mandible.

The presentation pattern of facial cleft is shown in Table 3. There were 162 (32.9%) left cleft lip compared with 113 (23.0%) right cleft lip, whereas the isolated cleft palate constituted 57 (11.6%) cases. The age of cleft patients ranged from 3 days to 70 years with a

mean (SD) 14.2 ± 14.2 years. A total of 327 (66.5%) patients were less than 10 years of age, whereas 165 (33.5%) were above 10 years.

Table 4 shows the characteristic presentation of TMJ ankylosis. The age range of TMJ ankylosis patients was 12–56 years with a mean (SD) 24.2 ± 24.3 years. The maximum interincisal distance ranges from 1 to 3 mm with a mean (SD) 1.3 ± 0.6 mm. Ear infection was the commonest cause of TMJ ankylosis, accounting for 7 (38.9%) cases.

A total of 622 (77.4%) cases were operated within the study period: 395 (63.5%) under general anesthesia, whereas 227 (36.5%) were operated under local anesthesia. Direct laryngoscopy with tracheal intubation was carried out in 389 (98.5%), tracheostomy in 6 (1.5%), and immediate jaw reconstruction with reconstruction plates in 5 (0.8%) patients. Minor complications were recorded but there was no mortality.

DISCUSSION

Epidemiological studies give an idea of disease pattern, predominance of certain conditions, and pattern of clinical behavior. This knowledge could assist in policy formulation to meet the need of a particular populace. The uniqueness of this study is that the data were generated from series of free surgical mission program across the North-central zone of Nigeria, compared with previous hospital-based reports.^[2,13,14] In a report from Kano, Nigeria,^[13] trauma accounts for more than half (55%) of maxillofacial surgical conditions and about a quarter (21%) being cases of tumors and allied lesions. This is not too different from about 46% due to trauma and 39% due to tumors and allied lesions recorded in another study.^[14] Free surgical missions are organized periodically and hence traumatic cases, which are accidental, are not usually part of the spectrum; only six cases were recorded in our study. However, the present study recorded more than half (57%) of the patients being facial clefts, whereas the rest were tumor and



Figure 1: A group of facial cleft patients seen during one of the outreach programme in North Central zone of Nigeria



Figure 2: A group of Facial tumour patients presenting for screening at one of the outreach programmes in North Central Zone of Nigeria



Figure 3: A group of TMJ ankylosis patients presenting for screening at one of the outreach programme in North Central Zone of Nigeria



Figure 4: (a) An ameloblastoma patient with 21 years duration of disease. (b) An ameloblastoma patient with 21 years duration of disease, treated by Resection plus immediate reconstruction with 2.4mm reconstruction plates

allied lesions. This is in sharp contradistinction with the earlier Nigerian studies where facial clefts accounted for 0.8% and 2.3%.^[2,14] It is possible that the high rate of facial cleft cases seen are a “harvesting phenomenon” as care for such conditions were not previously available in the communities covered by this outreach rather than evidence of high prevalence of such conditions. The workload of maxillofacial surgeons has changed substantially in Nigeria and other developing countries over the past 10 years due to part sponsorship of surgical care of facial clefts by Smiletrain International, a United States of America based non-profit organization. This development has brought some improvement in access to cleft surgery in the hospitals but still poor at community level. Adebayo *et al.*^[14] observed that the absence of studies on the overall pattern from various treatment centers in Nigeria makes it difficult to determine the relative contributions of each surgical condition to the average workload of the oral and maxillofacial surgeon. However, the few hospital-based studies complimented by the present one could give a fair idea of the present workload pattern in Nigeria.

Age range of 3 days to 76 years recorded in this study is not too different from similar studies. However, the mean age of 16.8 years is lower than a range of 31–38 years observed with these studies.^[2, 13, 14] The large percentage of patients with facial cleft, which are essentially a childhood disease, accounts for the reduced mean age at presentation in our study. A slim male preponderance (M:F, 1.2:1) is considerably lower than a ratio of 1.7:1 and 1.9:1 recorded by earlier studies.^[13,14] The large percentage of trauma cases in the quoted studies could be responsible for the male dominance. Several studies on maxillofacial trauma reported a clear male dominance.^[15-17] Bello *et al.*^[15] also recorded a clear male dominance of 3.6:1 (M:F) and concluded that male tends to be more involved in trauma because they are more active in outdoor activities. The present study is essentially that of non-traumatic surgical conditions of maxillofacial region and hence the justification for gender indifference.

This study observed a pattern of facial cleft that is comparable to other studies. The large percentage (33.5%) of adult patients older than 10 years was also reported by other studies from developing countries [Figure 1].^[18-20] There is an interesting distinction between hospital-based and this community-based study, even within developing countries. A mean age of 10 months was reported in Nairobi, Kenya^[21], whereas 85% of the patients reported in south western Nigeria fell within 4 years^[22]; however, the mean age in this study is 14 years. Majority of our patients are from low socioeconomic class and hence they were persuaded by free surgical mission to attend to their surgical needs. The baseline is poverty, ignorance, and poor access to treatment; despite the stigmatization and “out of school syndrome” associated with the disease condition, they could not attend regular hospital, which explains higher age of presentation at outreach programs. Preponderance of cleft lip compared with cleft palate was also recorded by other studies.^[21,22] Among the cleft lip patients, dominance of left side recorded in this study was also reported by Oginni *et al.*^[22]

The pattern of clinical presentation of tumor and allied lesions (odontogenic and non-odontogenic tumors, cysts, fibrous lesions, etc.) has some unique characteristics. The study has recorded a mean duration of lesion of 9 years and a mean surface area of 21.6 cm² at presentation [Figure 2] and [Figure 4a]. The measurement may not be very accurate, since it was not three-dimensional, but it gives an idea of the size of lesions that patients present with in developing countries. Many studies have reported late presentation of maxillofacial diseases in our environment but an idea of the size of the lesion was missing in the reports.^[23, 24] In a review of 128 patients with orofacial tumor,

Oji^[23] observed that ignorance and poverty were the main reasons for the late presentation of majority of the patients who belonged to the lower social class. He emphasized the necessity for early presentation and the establishment of adequate facilities in Nigeria and other developing countries, for effective treatment of these tumors. The North Central zone of the country, with a population of 20.2 million^[25] has a total of three poorly equipped tertiary centers with a total of four maxillofacial surgeons. In addition to this grossly inadequate manpower, the health insurance system is in its infancy of development with less than 5% total coverage and zero coverage for advanced surgeries such as facial tumor operations.

Temporomandibular joint (TMJ) ankylosis in adults (mean age of 24 years) presents a unique characteristic in this study [Figure 3]. In a series of 14 cases of TMJ ankylosis in Brazil,^[26] 64% were less than 16 years while ankylosis was reported in children in another study.^[27] Despite the stigmatization of facial deformity and functional dislocation precipitated by inability to open the mouth, most of these patients do not access health facility due to poverty and ignorance. Free surgical mission provides a platform to seek correction of the ailment. Clinical presentation recorded in this study is similar to earlier reports.^[10,11]

The pattern of management of odontogenic tumors is also changing in Nigeria. Fomete *et al.*^[24] observed gross facial deformity as the major complication following resection of facial tumors, due to lack of facility and technical know-how for reconstruction and restoration of facial form. About 0.2% of the patients had jaw reconstruction with plates and non-vascularized bone grafts, following jaw resection in this study [Figure 4]. The past 5 years has witnessed a steady growth in knowledge and the use of advanced reconstruction methods in Nigeria. Bello *et al.*^[28] while highlighting the challenges of reconstruction following ablative tumor surgery observed that jaw reconstruction with vascularized bone graft, even though is the gold standard, it is still a mirage or at best at experimental stage in Nigeria and most developing world. There is a need for an increased level of education and funding to acquire these advanced facilities.

The pattern of presentation of maxillofacial surgery diseases seen from the perspective of hospital-based and community-based surgical outreach programs gives a fair idea of the workload of a maxillofacial surgeons in Nigeria. With high degree of poverty, ignorance, and cultural beliefs, a large number of orofacial surgery cases may not visit hospital but will attend an outreach free surgical mission center following information by

a trusted relative. A large number of the patients in the present study had not visited a hospital before. This fact explains the difference in pattern of presentation between hospital-based and community-based maxillofacial clinics. As highlighted above, trauma cases are commoner with hospital-based studies.

CONCLUSION

The spectrum of maxillofacial surgery from community-based data was associated with higher percentage of facial cleft as compared to the hospital-based study that was associated with higher traumatic injury cases. There was a clear male dominance in hospital-based studies due to the high percentage of trauma cases as opposed to the community-based study with marginal male dominance. More adult cleft patients were reported during the community-based study because they had resigned to fate due to poverty and ignorance and were only encouraged to visit the clinic by the free nature of the program. Majority of the tumor and allied lesions present late with grotesque sizes at outreach programs, whereas most TMJ ankylosis patients were adult. However, there is steady growth in education and effort regarding jaw reconstruction in Nigeria. High level of poverty, ignorance, and poor access to maxillofacial service has been identified as shortcomings in the management of the diseases. There is a need for pragmatic move to improve facility, training, and more funding of outreach programs.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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