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FRACTURES OF THE MANDIBLE IN CHILDREN

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ABSTRACT

Objective: **To determine the pattern of occurrence of mandibular fractures in a paediatric population.**
Design: **A retrospective study.**
Setting: **University College Hospital, Ibadan, Nigeria.**
Subjects: **Seventy two paediatric patients seen and managed between 1989 and 1998.**
Results: **Road traffic accidents were the most common (52.8%) cause of mandibular fractures. The majority of the patients (57.0%) were within the age group (12 - 16 years). The body of the mandible was involved in 43.4% of the fractures. Eyelet wires with intermaxillary fixation was used in 41.7% of the cases.**
Conclusion: **There is a need to enforce legislation aimed at preventing road traffic accidents to reduce maxillofacial injuries among children.**

INTRODUCTION

Mandibular fractures are universally less frequent in children than in adults(1,2). Elasticity of children's facial bones and the infrequent exposure of children to alcohol related road traffic accidents are reasons that have been cited to explain this. Because of its sporadic occurrence, there is little information on mandibular fractures, especially in African children. The aim of this study was to analyse the pattern of occurrence, aetiological factors and sites of fracture, and methods of treatment employed in 72 children with mandibular fractures.

MATERIALS AND METHODS

This was a retrospective study of all radiographically confirmed mandibular fractures seen in children who were treated at the Department of Oral and Maxillofacial Surgery, University College Hospital, Ibadan, between January 1989 and December 1998. Case notes and radiographs were reviewed to obtain the age, sex, aetiology of injury, anatomic site of fractures and methods of treatment. All patients who were older than 16 years and those with solitary dental and alveolar fractures were excluded from this study. The sample was grouped into three age bands: group A consisted of patients aged seven months to five years, group B, patients aged six to eleven years and group C, patients aged twelve to sixteen years.

RESULTS

During the ten year period, 72 (8.2%) out of 873 patients with mandibular fractures were children between 0-16years. Age group C (12-16 years) accounted for the highest number of cases, 41 (57.0%). Twenty two cases (30.5%) were seen in group B while group A accounted for nine cases (12.5%). There were 53 males (73.6%) and 19 females (26.4%) . Male to female ratio was 2.8:1 (Table 1). The most common causes of mandibular fractures in our study were road traffic accidents which accounted for 38 (52.8%) patients in all groups. Falls were responsible in 17 (23.6%) of the cases while eight (11.1%) of the fractures were due to sport injuries. Other causes were assaults five (7.0%) cases, and other miscellaneous including gunshot injuries and pathological fractures accounted for four cases, (5.5%) (Table 2). Of all the fractures, 43.4% were in the body of the mandible, 19.8% in the parasymphyseal area and 17.0% in the symphysis.

Table 1

Age and sex of study sample

Age group (years)		Sex: Male	Female	Total	%
A	0-5	6	3	9	12.5
B	6-11	17	5	22	30.5
C	12-16	30	11	41	57.0
	Total	53	19	72	100.0

Male: Female = 2.8:1

Table 2

Aetiology of injury

Aetiology	No. of patients	%
Road traffic accidents	38	52.8
Falls	17	23.6
Sports	8	7.0
Assaults	5	11.1
Miscellaneous (Gunshots, pathological fractures)	4	5.5
Child abuse	–	–
Total	72	100.0

Table 3

Anatomic sites of mandibular fractures

Site	No. of fractures	%
Body	46	43.4
Parasymphysis	21	19.8
Symphysis	18	17.0
Angle	12	11.3
Condyle	8	7.6
Ramus	1	0.9
Coronoid	-	-
Total	106	100.0

Table 4

Methods of treatment used for mandibular fractures

Method	No. of patients	%
Eyelet wires with IMF	30	41.7
Eyelet wires, with archbar with IMF	18	25.0
Archbars with IMF	12	16.6
Archbar, eyelet wires with lower border wire with IMF	3	4.2
Archbar with lower border wire	1	1.4
No fixation (conservative)	8	11.1
Total	72	100.0

Table 5

Complications of mandibular fractures

Complication	No. of patients	%
Temporomandibular joint ankylosis	2	2.8
Dentoalveolar abscess	2	2.8
Osteomyelitis	2	2.8
Malocclusion	1	1.4
Malunion	1	1.4
Total	8	11.2

Less frequently seen were fractures of the angle (11.3%), condyle (7.6%) and ramus (0.9%) (Table 3). Mandibular fractures were treated in 30 (41.7%) patients by using eyelet wires with intermaxillary fixation only while eyelet wires with archbars and intermaxillary fixation were employed in 18 (25.0%) patients. Archbars with intermaxillary fixation were utilised in twelve (16.6%) patients while no fixation was used in eight (11.1%) patients (Table 4). Complications were seen in eight (11.2%) patients. Temporomandibular joint ankylosis, dento-alveolar abscess and osteomyelitis were each occurred in two cases while malunion and malocclusion ensued in one case each (Table 5).

DISCUSSION

Children seldom experience mandibular fractures. A prevalence rate of 8.2% was recorded in this study. This is higher than 3.4%, 4.5% and 4.81% recorded in studies done in West Germany(3), Sri Lanka(4) and United Kingdom(5), respectively. However, it is lower than 10.0% reported in United States(6). A male to female ratio of 2.8:1.0 was observed in this study. This is similar to 2.9:1.0 and 2.4:1.0 recorded by Cossio *et al*(1) and Amaratunga(4). Notably, a male to female ratio of 2.0:5.0 was reported by Waldron *et al*(7). The reason given for this observation was the small number of cases in their study. A higher degree of activity amongst boys was responsible for higher male prevalence in our study. Fractures of the mandible are less frequent in children under five years. Table 1 shows that only 12.5% of the total number of children in this study were in age group A (0-five years). This is similar to previous findings in other parts of the world (1,4,5). The low incidence in younger children had been attributed to limited outdoor activity and greater resilience of the mandibular bone in children under 5 years of age.

The aetiology of paediatric mandibular fractures varies with the location of the reporting institution and the population it serves. The most common aetiological factor of mandibular fractures in our study was road traffic accident (52.8%) (Table 2). This is in agreement with studies done elsewhere(1,3,8). This finding, however, differs from the study done in Sri Lanka(4) where falling from a height was the most common aetiology. Until the use of devices such as protective child restraints and seat belts are enforced road traffic accidents will remain the commonest cause of paediatric mandibular- fractures developing countries. The speed limit and alcohol abuse laws must also be maintained.

Falls were responsible for 23.6% of the fractures in this study. This is similar to 24.0% recorded by Cossio *et al*(1) but less than 48.6% recorded by Amaratunga(4). Inadequate supervision of children by parents, guardians and teachers at home and school and the involvement of these children in high risk activities such as window and tree climbing were responsible for this high incidence in our study. No case of mandibular fracture caused by child abuse was seen in this study. The most common site of mandibular fracture was the body with a total of 46 (43.4%) fractures (Table 3). This is in agreement with studies done in Nigeria(2) and United Kingdom(9) but differs from studies done in Spain(1) and Sri Lanka(4) where the condyle was the most common site of mandibular fractures in children. The basic principles of treating mandibular fractures during the deciduous and mixed dentitions were followed in this study. Simple and inexpensive methods of immobilisation were used because of the nature of fractures, the bone and the teeth at the growing age. Eyelet wires with intermaxillary fixation was used in 30 (41.7%) patients. In 4 (5.5%) patients who were older than 13 years, open reduction with placement of lower border wires were used since the teeth were safely away from the inferior border of the mandible. A short period of two to three weeks of intermaxillary fixation was utilized in this study. This

was done because of the high osteogenic potential in young children and to prevent temporomandibular joint ankylosis as a complication of condylar fractures. A period of four weeks of immobilisation had been advocated by Rowe and Killey(9) while a shorter period of two to three weeks had been suggested by other investigators(10,11).

Complications were seen in eight (11.2%) patients. Temporomandibular joint ankylosis, osteomyelitis and dentoalveolar abscess were seen in two patients each. These complications were as a result of protracted treatment, lack or inappropriate use of antibiotics and delayed mobilisation of condylar fractures. The temporomandibular joint should be mobilised early when paediatric condylar fractures are treated.

The incidence of mandibular injuries in children appears to be on the increase all over the world. Therefore, there is a need to educate parents, teachers and sports coaches of the importance of preventing maxillofacial injuries. It is also advised that surgeons should play a more active role in this preventive aspect of paediatric patient care(12).

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