

# A Comparative Study of Mandibular Fractures in Senegal: Children vs. Adults

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## Abstract

**Introduction:** The commonest maxillofacial fractures involve the mandible. Age can be considered among influential factors. **Aim of the Study:** To compare mandibular fractures between children and adults from the beginning up to the treatment in Senegal. **Patients and Method:** A three-year retrospective study was conducted in a university hospital. The medical records of patients admitted for maxillofacial injuries were reviewed. Patient and injury-related variables including age, gender, etiology, average consultation delay, anatomic location of fracture and treatment were compared up to age of 15 and beyond that. **Results:** Considering 272 casualties, maxillofacial fractures were less frequent among children than adults (36.7% and 59.7%) and were mainly mandibular (90.1% and 91.4%). Male predilection (sex ratio of 2.4 and 4.9) was twice (2) as pronounced from the age of 16. The average consultation delay was two (2) times shorter for children. Road traffic accidents which predominated among children (33.9%) had comparable frequency (32.3%) although they were outnumbered by assault (37.6%) among adults. Fractures occurred mainly on the corpus (90.1% and 90.4%), particularly on parasymphysis (40.1%) up to the age of 15, whereas angle fractures increased (8.5% to 19.6%) and joint damage decreased afterwards. Intra-oral orthopedic procedures (91.2% and 92.6%) in which mandibular retention splints were more common (37.3%) up to the age of 15 then arch ligatures (49%) were then widely favored. **Conclusion:** Differences relating to the distribution of causes but also to the anatomic location on the corpus and to the choice of intra-oral orthopedic procedures within overall similarities between children and adults regarding the male predilection, the frequency of road traffic accidents, the mandibular injuries, but also the school therapeutic attitude consisting of favoring the orthopedic option.

## Keywords

Fracture, Mandible, Child, Adult

## 1. Introduction

The oral health strategies across Africa predict an increase in maxillofacial trauma [1]. The commonest fractures involved the mandible [2]. Age can be considered among influential factors. Up to now, there has been no comparative study focusing on mandibular fractures between children and adults in Senegal. A comparative study may improve the prevention and the management of mandibular fractures. The aim of this study was to compare mandibular fractures between children and adults from the beginning up to the treatment in Senegal.

## 2. Patients and Method

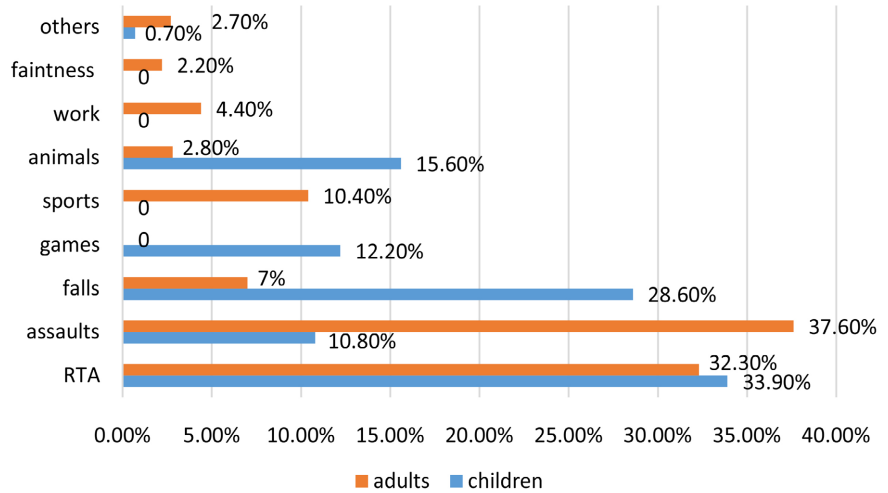
A 3 years (36 consecutive months) retrospective study was conducted at the oral and maxillofacial surgery department of Cheikh Anta Diop University. The medical records of all patients admitted for maxillofacial trauma were reviewed from January 2015 to December 2017. On a medico-legal criterion, subjects aged up to and including **age of 15** were considered children. Orbital-zygomatic-maxillary (OZM) fractures, mandibular fractures or dental trauma and these associated lesions (OZM and mandibular fractures, OZM fracture and dental trauma, mandibular fracture and dental trauma, OZM and mandibular fractures as well as dental trauma) were considered as maxillofacial trauma. Thus, mandibular fractures and associated lesions (OZM and mandibular fractures, mandibular fracture and dental trauma, OZM and mandibular fractures as well as dental trauma) were grouped together. Patient and injury-related variables including sex-ratio, etiology, average consultation delay, anatomic location of mandibular fracture and treatment were compared up to age of 15 and beyond that. Games and sports were considered up to the age of 15 and from the age of 16, respectively. Patients whose records were poorly documented were excluded. The data collected was processed using spreadsheet software.

## 3. Results

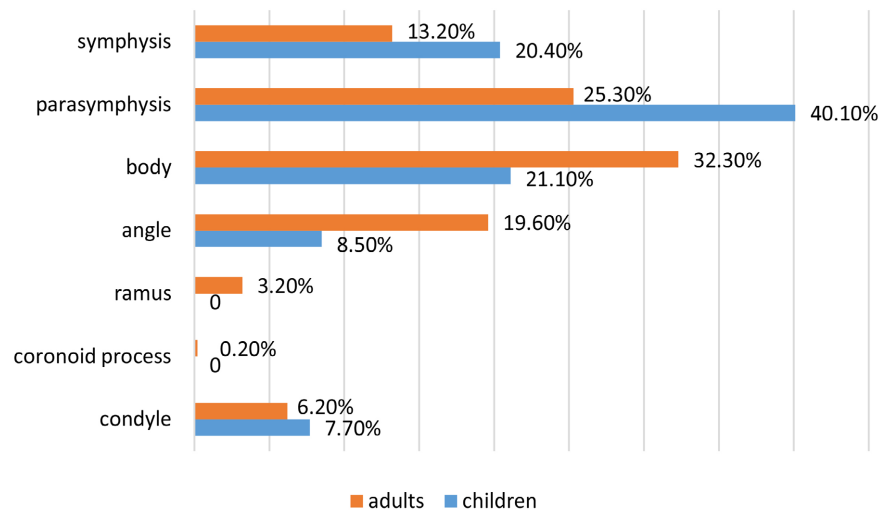
Considering 272 casualties, the youngest and oldest were 1 and 84 years old, respectively. Maxillofacial fractures were less frequent among children (36.7%) than adults (59.7%) and were mandibular (90.1% and 91.4%) in the two groups of patients. Male predilection (sex ratio **of 2.4 and 4.9**) was twice (2) as pronounced from the age of 16. The average consultation delay was two (2) times shorter for children (2.95 versus 5.45). The etiologies, anatomical location of fracture and treatment are compared in **Figures 1-3**. The orthopedic devices are compared in **Table 1**.

## 4. Discussion

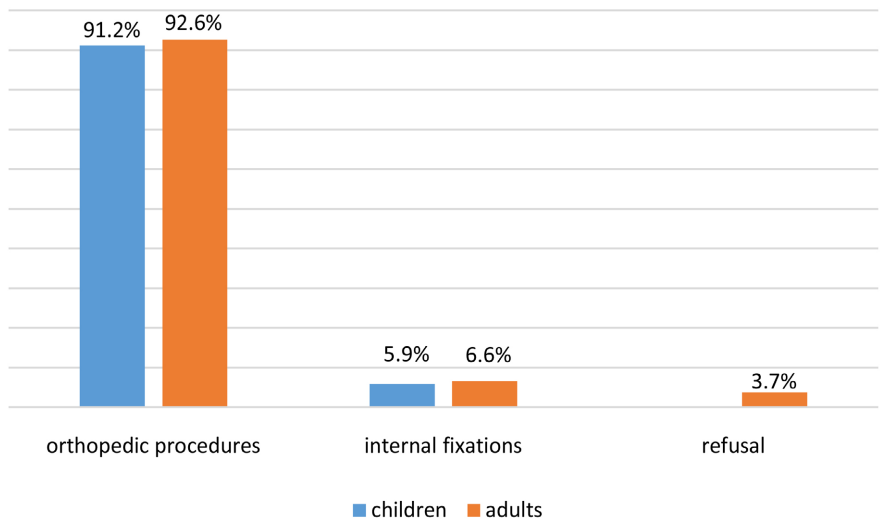
The medico-legal age criterion seems justified for studying trauma. Most spreadsheets software are suitable for simple comparison of collected data. The size of this series implies homogeneous results in each group.



**Figure 1.** Distribution of etiologies in children and adults.



**Figure 2.** Topographical distribution in children and adults.



**Figure 3.** Indicated treatment in children and adults.

**Table 1.** Intraoral orthopedic procedures used in children and adults.

Orthopedic procedures	Children	Adults
Archs	23.5%	49%
Ligatures	9.9%	26.3%
Arch and ligatures	6.9%	7.2%
Houpert ligatures	13.7%	0%
Retention splints	37.3%	6.4%

Maxillofacial fractures predominate over dental and periodontal lesions from the age of 16 (59.7%), particularly localized in the mandible (90.1% and 91.4%) in accordance of the usual data [2] [3]. Indeed, the bony bases are less flexible while the mandible is a bumper of the face.

Male predilection (2.4 and 4.9) is classic [4] [5] [6]. However, the accentuation from the age of 16 could be explained by more differentiated behaviors.

The more prompt consultation of children can be explained by the increased concern of the parents who bring them.

Road traffic accidents which predominated among children (33.9%) and their comparable frequency (32.3%) among adults go against the trend in industrialized countries where road safety prevails [3] [4] [5]:

□ Domestic animals are mainly incriminated among children (15.6% versus 2.8%) whose faces are more within reach of horse kicks and loss of consciousness (2%) is exclusive to adults who are more exposed to faintness.

Fractures were mostly located on the corpus (90.1% and 90.4%):

- The parasymphysis (40.1%) is weakened by the germ of the canine in an external and low position up to the age of 11 years;
- The angle (19.6%) is weakened by its closure and by the evolution of the third molar from the age of 17 and appears as temporomandibular joint protector;
- Joint damages are often unnoticed and more frequent in countries with high health coverage [2] [5].

With the consultation delay often beyond 3 days, the rupture of the adherent mucosa on the corpus implies the threat of infection on the open fracture.

Open reduction and internal fixation are contraindicated by dental germs. Intra-oral orthopedic procedures are more accessible financially for patients as well as technically within dentist involvement and are widely favored (91.2% and 92.6%) despite the advent of open reduction and internal fixation over the past forty years [5] [6] [7].

□ Open reduction and internal fixation are reserved for selected cases that cannot be treated by intra-oral orthopedic devices (muscle interposition, pseudarthrosis, comminuted fracture), if the situation is favorable (recent trauma and/or early antibiotic therapy) or to free the temporo-mandibular joint from the formation of fibrous callus after 15 days in case of associated

joint injury;

- The mandibular retention splints are indicated on weak and unstable deciduous teeth, in cases of dental avulsion sites or, also, to free the temporomandibular joint.

## 5. Conclusion

Differences relating to the distribution of causes but also to the anatomic location on the corpus and to the choice of intra-oral orthopedic procedures within overall similarities between children and adults regarding the male predilection, the frequency of road traffic accidents, the mandibular injuries, but also the school therapeutic attitude consisting of favoring the orthopedic option.

## Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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