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Clinical analysis of facial fractures: A ten years study of 300 cases

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ABSTRACT

The reasons and types of facial fractures and their treatment approaches are different, depending on the age group, and these fractures constitute an important part of the practice of plastic surgery. Demographic characteristics, etiologies of fractures, fracture types, and treatment approaches were evaluated in patients who underwent an operation due to facial fractures between 2006 and 2016. A total of 300 patients were operated on at our clinic over a period of ten years. The reason for the fracture was often motor vehicle collisions in the adult patient group, while the reason was falls and accidents in the pediatric age group. Mandibular fractures ranked first among other types of fracture and orthopedic injuries ranked first among systemic injuries. The preferred treatment approach was open surgery in adult patients and conservative therapies in the pediatric age group. The present study carried out a retrospective review of 300 cases and demographic characteristics, etiologies, fracture types, accompanying injuries, and treatment approaches were presented in consideration of the current literature.

1. Introduction

Facial fractures can be caused by a variety of reasons and they constitute an important part in the practice of plastic surgery, although treatment algorithms may differ between the clinics. The etiology and types of facial fractures and treatment approaches are different between the adult age group and the pediatric age group. The aim of the present manuscript was to evaluate demographic characteristics, fracture types, and treatment approaches in patients who underwent surgery at our clinic due to facial fractures in consideration of the current literature.

2. Methods

Age, gender, trauma mechanism, fracture types and locations, accompanying injuries, and treatment principles in patients who were operated on at Gazi University Department of Plastic and Reconstructive Surgery, between May 2006 and April 2016 were retrospectively reviewed and compared. Only acute trauma patients admitted to the emergency department were included in the study.

3. Results

A total of 300 patients underwent surgery in a period of ten years (2006 through 2016). Of these patients, 72 (24.1%) were females and 228 (75.9%) were males. There were 43 patients (14.3%) in the pediatric age group (under 18 years). The mean age was 33.8 years (min: 2, max: 84) (Table 1). Motor vehicle collisions

ranked first (%37.03) as the cause of injury in the two genders. This was followed by assault in 87 cases (33.8%), falls and accidents in 72 cases (28.01%), and gunshot injuries in three cases (1.16%) (Fig. 1). Of the patients, 255 (85.2%) had isolated fracture of a single facial bone, while 45 patients (24.8%) had fracture of multiple facial bones. Among adult fractures, mandibular fracture ranked first with 117

Table 1. The demographic characteristics of patients

Number of patients	300
Male	228
Female	72
Adult (>18y)	257
Pediatric	43
Mean age	33.8 (2-84)

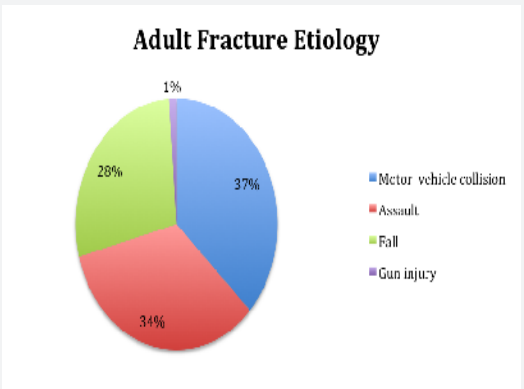

Fig. 1. Etiology of fractures in adult patients

cases (45.5%) in the two genders. Fractures of the orbita occurred in 79 cases (30.7%), zygomatic fractures occurred in 32 cases (12.4%), frontal bone fractures occurred in 15 cases (5.8%), maxillary fractures occurred in nine cases (3.5%), and nasal fractures occurred in five (1.94%) cases (Fig. 2). Complex fracture of the orbital-zygomatic-maxillary

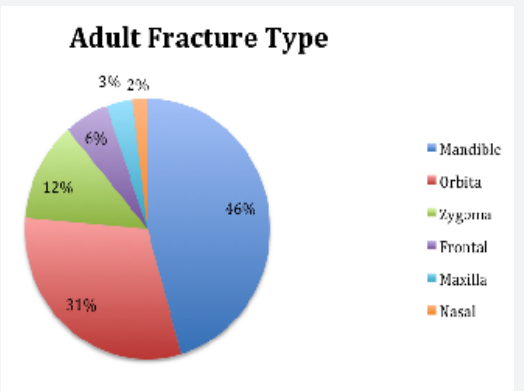

Fig. 2. Type of fractures in the adult group

bones that occurred in 32 cases ranked first in patients with fractures of multiple facial bones. Seven cases had orbital-maxillary fractures and six cases had panfacial fractures. In patients with mandibular fractures, 37 had isolated parasymphysis fracture, 26 had condylar-subcondylar fractures, 16 had angulus fractures, and ten patients had angulus-parasymphysis fractures as the most common fracture types occurring in these patients (Fig. 3).

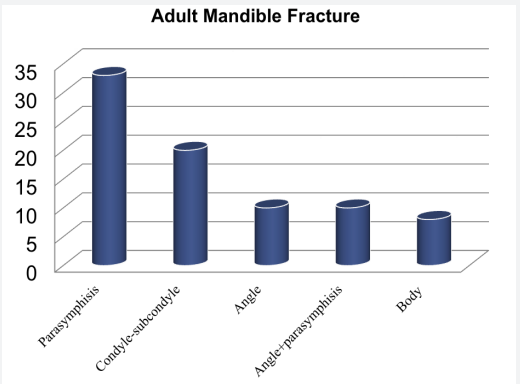

Fig. 3. Adult mandibular fracture types

Fifty-six patients had isolated orbital floor fractures and during reconstruction surgery, Medpor sheets were used in 24 patients, bone lamina was used in 14 patients, titanium mesh was used in six patients, resorbable mesh was used in five patients, bone graft was used in four patients, and silicone block was used in three patients (Fig. 4).

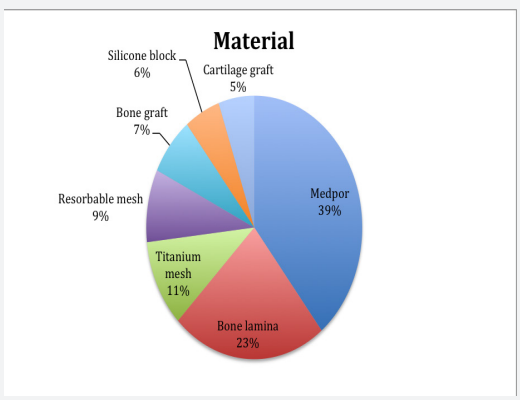

Fig. 4. Materials used in the reconstruction of orbital floor

The etiology of fracture in the pediatric age group was falls and accidents in 38% of the patients (16 cases), motor vehicle collisions in 32% of the patients, and battery in 30% of the patients (Fig. 5). Mandibular fracture was the most common diagnosis that

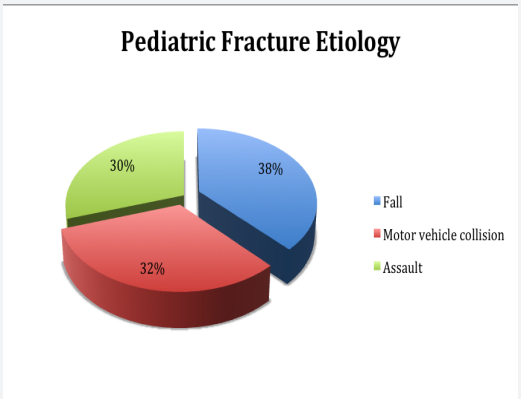

Fig. 5. Etiology of pediatric fractures

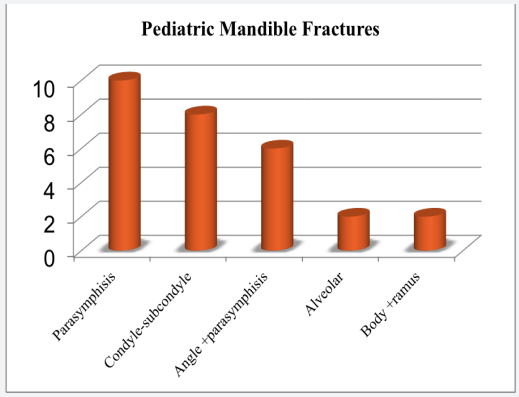

Fig. 7. Mandible fractures in the pediatric group

occurred in 24 cases and parasymphysis fracture (40.9%) ranked first in patients with mandibular fractures (Fig. 6 and 7). Thirty-six patients (12%) had an accompanying injury. Of these patients, 14 (34%) had orthopedic injuries, 12 had intracranial pathologies, ten had injuries in multiple systems, injury was motor vehicle collision in patients with an accompanying injury. Closed reduction of the fracture via temporal approach was used in 61% of patients with isolated zygomatic arc fracture. Conservative approach and maxilla-mandibular fixation were preferred in the treatment of condylar fractured in the pediatric age group, while 66% of adult patients underwent open surgery through preauricular incision.

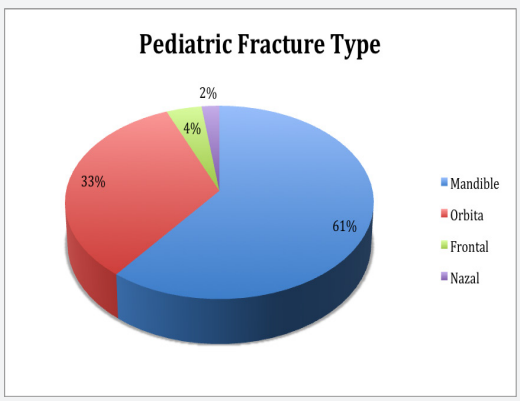

Fig. 6. Fracture types in the pediatric group

4. Discussion

The treatment approach in maxillofacial fractures differs depending on the fracture mechanism, fracture type, and age group. Similar to that reported in the literature (Gassner et al., 2003; Kaul et al., 2014; Atisha et al., 2016), motor vehicle collisions ranked first among the causes of fractures in adult patients in the present study that evaluated maxillofacial fractures at our clinic. Atisha et al. (2016) evaluated 2023 cases and reported that accidents ranked first (72%) among other etiologies of facial fractures in the population aged above 65 years, while motor vehicle collisions assault ranked first (41%) in the population aged under 65 years. In the present study, accidental falls ranked first among other etiologies of fracture occurring in 66% of population aged above 65 years, while falls ranked first in the pediatric age group. Mandibular fractures ranked first among other fracture types and different from many studies in the literature, parasymphysis fracture was more common than angulus and subcondylar fractures, in both the adult and pediatric age groups (Gassner et al., 2003; Kaul et al., 2014; Bede et al., 2016). Orthopedic injuries were the most common conditions accompanying facial fractures similar to that reported in the literature (Gassner et al., 2003; Atisha et al., 2016). All patients were operated on under general anesthesia. The bicoronal approach was used as the first choice in the treatment of frontal fractures, while subciliary incision or existing facial lacerations were used in the repair of orbital floor fractures. Our preffered treatment of isolated displaced anterior table fracture is depents on nasofrontal duct injury. Anterior table fracture with associated nasofrontal duct injury mandates frontal sinus obliteration and permanent blockage of the nasofrontal duct with pericranial flap, fat, fascia or bone chips. When the posterior table is minimally involved but the nasofrontal ducts are injured, frontal sinus obliteration was performed. When the posterior table is significantly displaced, cranialization of the frontal sinus with obliteration of the duct was performed. We preffered resorbable plates in the pediatric age group except mandible fractures, mini and micro titanium plates were used in the adult age group. Alloplastic materials were more frequently preferred in the reconstruction of the orbital floor, similar to that reported in the literature (Gart and Gosain, 2014). The intraoral approach was preferred in

the repair of mandibular corpus and angulus fractures, the preauricular approach was preferred in 66% of adult patients with condylar fracture, while closed reduction and intermaxillary fixation was preferred in the pediatric age group similar to other studies (Rashid et al., 2013; Yamamoto et al., 2013). Mini or reconstructive titanium plates were used for fixation of mandibular fractures. The temporal approach (gilles) was preferred in 61% of patients with zygomatic fractures.

In this retrospective review of the patients, demographic characteristics and treatment choices were presented in consideration of the knowledge of the current literature. The fracture mechanisms were similar to those reported globally in the literature. Except the location of the mandibular fracture, fracture types in the other facial bones were similar to those reported in the literature.

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