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A Retrospective Analysis of Facial Fractures in Kuwait

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Abstract

***Background:** Facial fractures are one of the commonest injuries seen in emergency department. This type of fracture has different impacts on the patient; physiologically, functionally as well as having an effect on personal self-stem. Furthermore, facial fractures are not an uncommoninjury further studies are needed to widen our understanding regarding these particular types of fractures.*

***Method:** A retrospective study was conducted through a data collected from the oral and maxillofacial department in Al-Amiri Hospital during the period of January 2017 to June 2020 to analyze the risk associated with facial fracture.*

***Result:** Young adult males were the most affected population that presented with facial fractures in our department, with a ratio of 3.2:1 male (76.3%) to female (23.7%) and age group between 21-30 mostly (42.5%). RTA (37.5%),falls (32.5 %), assault (21.25 %) followed by sports injures respectively are the commonest etiology. The majority of fractures were I the mandible (66.25%) either in one site of the mandible or combined fracture, and the second most common site was the zygomatomaxillarycomplex (17.5%). The management of choice for facial fracture in Al-Amiri hospital was ORIF (95%)*

***Conclusion:** our current study demonstrated that age, gender and etiology affect the prevalence of facial fracturesas well the site of fracture and our choice to manage and treat these types of injuries.*

Keywords: *facial fracture, maxillofacial, RTA, Kuwait, Mandible, open reduction*

Introduction

Worldwide facial trauma associated with facial bone fractures is one of the most common injuries seen in the emergency department(1). Functional, aesthetic, and psychological issues arise because of these fractures, hence prompt diagnosis and management is essential(2) . Analysis of these patients assists us in comprehending the demographics and epidemiology, raising awareness, and thus decreasing incidence.

Causes,sites, gender and age distribution of facial fractures varies according to geographic location. Young adult males were most affected population in studies held in Wales, Turkey, Iran, India, Nigeria and Taiwan(3–8). Recants studies worldwide identify RTA, assault and fall as the cause of facial fracture in majority of the cases. Mandible, zygomatic and nasal bone are the most prominent bones in the face; in which they are the most common site of fracture.

The purpose of this study was to broaden our understanding of facial fractures by assessing risk factors associated with various maxillofacial trauma cases reported to Al-Amiri Hospital in Kuwait. Al-Amiri Hospital is a general Hospital located in Kuwait City and it serve an estimated 400,000 patients per year.

Materials and Method

Study design and sampling

A retrospective analysis was conducted on patients with facial bone fractures who presented to the Oral and Maxillofacial Department at Al-Amiri Hospital during the period of January 2017 to June 2020.

Patients' information was gathered through their medical files or outpatient records, and diagnosis of these fractures was reached through clinical and radiological examination. Patients were categorized according to age, gender, etiology, fracture pattern, and surgical treatment modality. Overall, 80 patients were included in this study.

data analysis

We analyzed the number of facial fractures byage, gender, etiology location of fracture and type of management. Age was divided into eight groups; each ten years were divided into one age group.cross-tabulation analysis was used for analyze the gender-specific number of facial fracturesaccording to four different etiologies. Facial fractures were classified into isolated mandibular fractures, combined mandibular fractures, isolated zygomatic fracture, combined zygomatic fracture, isolated orbital floor fracture, combined orbital floor fracture and frontal bone fracture. Facial fractures were managed either by ORIF or IMF in our study.

Ethical consideration

Permission and approval from the concerned authority in Al-Amiri hospital was taken prior to assessment of the patients' files and record

Result

During the period of January 2017 to June 2020, a total of 80 cases with facial bone fracturespresented to Al-Amiri oral and maxillofacial surgery department.

The range of patients' age was from 8 to 75 with a mean age of 30 and a median age of 26. The age range with the highest number of patients withfacial fractures were 21-30 (42.5%) and the lowest were for both age groups 51-60 and 61-70 (1.25%)(table 1 and figure 1)

Table 1

Age group (years)	Number of patients (%)
0-10	4 (5%)
11-20	15 (18.75%)
21-30	34 (42.5%)
31-40	9 (11.25%)
41-50	12 (15%)
51-60	1 (1.25%)
61-70	1 (1.25%)
71-80	4 (5%)

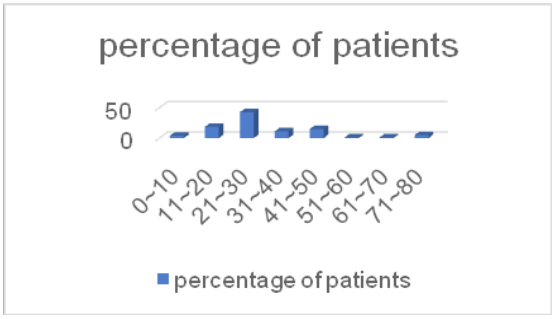

Table 1 & Figure 1. *Distribution of patients with facial fractures stratified according to their age group.*

The ratio of male to female patients presenting to Al-Amiri Hospital oral and maxillofacial department with facial fractures was 3.2:1 with 61cases being male and 19 cases being female (table 2 and figure 2)

Table 2

Gender	Number of cases (%)
Male	61 (76.3%)
Female	19 (23.7%)

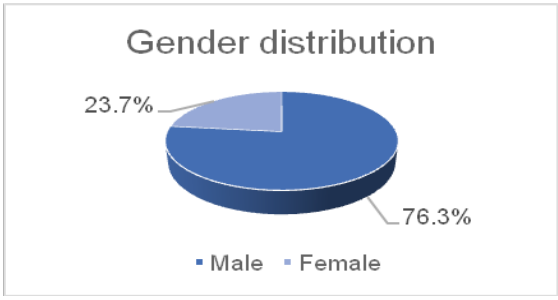

Table 2 & Figure 2. *Distribution of patients withfacial fractures stratified according to their gender*

As can be seen in the data, there were 4 different etiology that contributed in facial fractures. RTAs was the most common cause in both males and females (37.5%); of which males (23) were almost as triple as females (7). Followed by falls which wasa common cause as well (32.5 %). Assault injuries was the cause of facial fractures in 17 patients (21.25 %). And sports injuries as a cause of fractures noticed only in males' gender (7) (table 3 and figure 3)

Table 3

Number of cases in females	Number of cases in males	Etiology
7	23	RTA
6	20	Fall
5	12	Assault
0	7	Sports injury

RTA: Road traffic accident

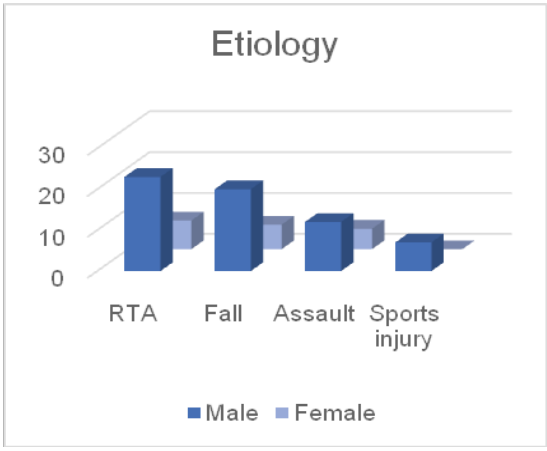

Table 3 & Figure 3. *Distribution of patients with facial fractures stratified according to their gender and cause of injury*

The distributions of fractures according to the anatomical location shown in table 4 shows that the most common presentation was Isolated zygomatomaxillary (17.5%). There was a total of 26 cases presented with combined mandible fracture parasymphyseal fracture with fracture of angle of mandible (12.5%) was the most common combined anatomical locations of mandibular bone fracture. Seven cases presented with combination of parasymphysis and condyle fracture (8.75%). Body fracture combined with angle fracture count for only three cases (3.75%). as well isolated angle fracture was the presentation of 10 patients (12.5%). Eight patients presented with isolated parasymphysis fracture (10%). The frontal bone was the least isolated bone to get fractured with only 1 case out of the 81 total cases (1.25%) (table 4)

Table 4. *Distribution of the location of the facial fractures in patients that participated in this study*

Fracture pattern	Number of cases (%)
Parasymphysis	8 (10%)
Body	6 (7.5%)
Condyle	3 (3.75%)
Angle	10 (12.5%)
Body + Angle	3 (3.75%)
Parasymmphysis + Angle	10 (12.5%)
Parasymmphysis + Condyle	7 (8.75%)
Parasymmphysis + Ramus	2 (2.5%)
Parasymmphysis + Body	3 (3.75%)
Ramus + Body	1 (1.25%)
ZMC	14 (17.5%)
ZMC +Maxillary sinus wall	2 (2.5%)
ZMC + Angle	1 (1.25%)
ZMC + Orbital floor + Maxillary sinus wall	3 (3.75%)
Orbital floor	2 (2.5%)
Orbital floor + Maxillary sinus wall	2 (2.5%)
Frontal wall	1 (1.25%)

ZMC: Zygomatomaxillary complex

There are many treatment protocols, it varies according to the type and location of each fracture and our experience preference. Majority of cases in our study was treated surgically by open reductionand internal fixation (95%). Only a small percentage was treated with intermaxillary fixation (5%) (table 5 and figure 4).

Table 5

Surgical option	Number of cases (%)
ORIF	76 (95%)
IMF	4 (5%)

ORIF: Open reduction internal fixation. IMF: Intermaxillary fixation

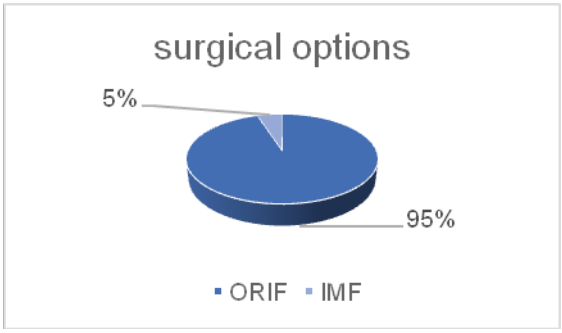

Table 5 & figure 4. *Distribution of patients with facial fractures stratified according to the type of surgery that have been used to manage the patient.*

Discussion

In our study it was observed that the age range between 21-30 was the group with the highest number of cases of facial fractures. This can also be noticed in the study conducted by Kaura et al in India (6). Similar results were also seen in multiple studies carried out all over the world (3,5,7–12). This could be due to the fact that people in this age group lead a more active lifestyle as they would be more involved in travel to multiple locations, sports, and activities outdoors (7).

With regards to gender our study showed that the majority of cases were males with a ratio of

3.2:1. Multiple studies also presented with male predominance (3–8,10,12,14). The reason behind this finding could be that males were more likely to be involved in high-risk activities (9) and composed the majority of the workforce.

Road traffic (RTA) was the most common cause of facial fractures in patients visiting Al-Amiri Hospital. Various other studies gave concordant results (7,11,16,17) Kuwait has the highest traffic accident death rate despite its small population and one of the highest rates of road traffic accidents in the world (13,14), thus reinforcing our result. The second most common cause was falls, which did not resemble the results in the study conducted by Kaura et al.(6,20,21) that showed assault to be the second most common cause. Other (22) identify assault as the most frequent etiology.

This current study as well as previous studies (6,8,23) demonstrated that the most frequent fracture discovered was mandible fracture as it is the most prominent bone in the face. There was a wide variation in the exact location of mandibular fracture. The commonest combination was parasymphyseal fracture with fracture of the angle of the mandible followed by parasymphyseal and codyle fracture. Knowing the location and combination of mandible fracture can aid in assessment and management of any case. The least isolated bone fracture was frontal bone fracture.As opposite to our findings other studies showed that nasal bone fractures were the most common site of injury(3,9). In addition, some studies demonstrated that the commonest injures were soft tissue injury, alveolar process and tooth followed by mandibular fracture(11).

The surgical option varies across the world. There are multiple factors that contribute to our choice of the treatment, such as; type of fracture and location, patient preference and the surgeonsexperience. Open reduction and internal fixation isthe most common treatment option for facial fractures worldwide (7,23–27) . IMF was another surgical option but was rarely preferred on our patients. On the other hand, some studies (4,28,29)Show that other surgeonsprefer to treat the patient through closed reduction, which minimizes the post-operative side effects and aids in rapid healing.

Our study faces some limitations. First, it was a retrospective study that used a data extracted from a single institutional database which leads to the modest sample size thatis not representable of the whole population. Secondly, our result determined only association and not causation.

Conclusion

This current study conclude that RTAs were the most common cause of facial fracture in patients visiting Al-Amiri Hospital. Patients age and gender were hugely associated with the prevalence of facial fracture in Kuwait. The treatment optionsvary depending on the type fracture and surgeon preference. In our study we conclude that open reduction with internal fixation was the commonest way to treat facial fractures. Knowing that young adult males are the most affected in the community and the mandible is the commonest bone to get fracture will aid in implanting solutions to lower the incidence in the future

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