

## Study of the Medicolegal aspect of Trauma, Cases came to Emergency Department at Beni-Suef University Hospital "Egypt"

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### Abstract

Trauma is the 6th leading cause of death worldwide resulting in 5 million of all deaths. It is the 5th leading cause of significant disability. In Egypt, injuries the fifth leading cause of death and the most common cause of hospitalization and account for at least 1/4 of all inpatients. The aim is to identify the medico-legal importance of different causes of orthopedic trauma to patient admitted at Beni-Suef university hospital and identify their relation with different demographic data of the patient. Data of 207 patients with orthopedic trauma admitted at Beni-Suef university hospital period from September 2016 to December 2016. Age, sex, residence, cause, site, number of trauma, type of fracture, investigation done, treatment and also associated other injuries are reported. The most common cause of trauma is motorcycle accidents (25.6%) followed by fall on ground (25.1%). Lower extremities are the most common site of trauma (44.9%). Most of cases have single fracture (71.5%) with simple type (50.3%). X-ray is the most common investigation done to patients (71%). (68.1%) of cases need operative treatment. (84%) of cases came with orthopedic trauma only not associated with other injury. While the most common associated injury is wounds over skin (5.4%). Limb injuries are a common problem among the physically active, and such injuries may result in diminished performance, reduced participation, and in the longer term loss of function, chronic joint disease, and disability. Limb injuries represent the commonest form of injury involved in road traffic accidents

**Keywords:** Admissions; fracture; infection; orthopedics; trauma.

### Background

In Egypt, injuries are a significant source of morbidity and mortality. They're the fifth leading reason behind death and also the leading cause of hospitalization and account for a minimum of one quarter of all inpatients<sup>3</sup>. It's the leading reason behind mortality and incapacity during the first four

decades of life. Trauma is the sixth leading cause of death worldwide leading to 5 million or ten percent of all deaths. It is the fifth leading reason behind total incapacity<sup>19</sup>. Orthopedic trauma represent the most common sort of injury concerned in RTA (Road Traffic Accidents).it is a common drawback for the physically active and such injuries could lead to diminished performance, reduced participation

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and, within the long run, loss of perform, chronic joint illness, and disability<sup>5</sup>. The World Health Organization has predicted that traffic fatalities will be the sixth leading cause of death worldwide and the second leading cause of disability-adjusted life-years lost in developing countries by the year 2020<sup>22</sup>.

### Subjects and Methods

This is a prospective study. For statistical purposes. Data of all cases who were exposed to different types of trauma lead to orthopedic trauma and have been report at Beni-Suef university hospital (admitted at Beni-Suef university hospital) were collected and analyzed. At period from September 2016 to December 2016.

#### Statistical analysis:

- Computer software package SPSS 24 was used in the analysis.
- Frequency and percentages were presented for categorical variables.
- Chi-square and Fischer’s Exact tests were used to estimate differences in qualitative variables. P value showed significance below 0.05.

### Results

The total patients’ number during the period of the study was 207 patients.

Table 1 showed the demographic data of the studied patients which revealed that males (68.6%) outnumbered females (31.4%) with male to female ratio 2:1. The most common age group is (31-60) years old (30.4%), followed by age group (0-18) years old (30.0%). Many of injured cases came from urban areas (54.1%).

Table 2 showed the data of trauma which revealed that the most common cause was motorcycle accidents (25.6%), followed by fall on ground (25.1%), then car accidents (20.8%). The most common site of trauma was lower extremities and pelvis (44.9%), followed by upper extremities (26.0%), then skull (18.8%). The most common type of fracture is simple fractures (50.3%) followed by comminuted fractures (30.9%). The most common number was single fracture (71.5%). Most of cases require operative treatment (68.1%) followed by intervention treatment

(27.1%) and least cases need conservative treatment only (4.8%). Most of cases had no other injuries (84.0%), wounds were the most common associated injuries (5.4%).

Table 3 showed there is a significant relation between age and sex as in all age groups males were more than females except for age groups above 60 yrs. (P value <0.000). Also there is a significant relationship between age and cause of trauma (P value <0.000) as motorcycle accident was most common in age group (31-60y) and least number of cases was in age group (>60y). The significant relationship between age and treatment of cases (P value <0.028) as cases who need operative treatment are more in age group (31-60y). While cases who need intervention are more in age group (0-18y).

**Table 1: The demographic data of the patients**

	N (%)
<b>Sex</b>	
Male	142 (68.6)
Female	65 (31.4)
<b>Age</b>	
0-18y	62 (30.0)
19-30y	59 (28.5)
31-60y	63 (30.4)
>60y	23 (11.1)
<b>Residence</b>	
Urban	112 (54.1)
Rural	95 (45.9)

**Table 2: The data of trauma**

	N (%)
<b>Cause of trauma:</b>	
Motorcycle accident	53 (25.6)
Fall on ground	52 (25.1)
Car accidents	43 (20.8)
Fall from height	17 (8.2)
Direct trauma	16 (7.8)
Fall down stairs	15 (7.2)
Pedestrian	8 (3.9)
Gun shot	2 (1)
Train accident	1 (0.5)

	N (%)		N (%)
<b>Site of trauma:</b>		<b>Treatment:</b>	
Lower extremities & pelvis	93 (44.9)	Operative	141 (68.1)
Upper extremities	54 (26.0)	Intervention	56 (27.1)
Skull	39 (18.8)	Conservative	10 (4.8)
Spine	1 (0.5)	<b>Associated injuries:</b>	
Thoracic cage	3 (1.5)	Non	174 (84.0)
Multiple sites	17 (8.2)	Wounds	11 (5.4)
<b>Type of fractures:</b>		Neurological injuries	10 (4.9)
Simple	104 (50.3)	Abdominal injuries	5 (2.4)
Comminuted	64 (30.9)	Disfigurements	3 (1.5)
Spiral	21 (10.1)	Cardiothoracic injuries	2 (1)
Simple depressed	5 (2.4)	Vascular injuries	1 (0.5)
Compound depressed	13 (6.3)	Multiple injuries	1 (0.5)
<b>Number of fractures:</b>			
Single fracture	148 (71.5)		
Multiple fractures	59 (28.5)		

**Table 3: Relationship between age and (sex, cause of trauma and treatments)**

	Age groups n (%)				P value
	0-18y	19-30y	31-60y	>60y	
<b>Sex</b>					<b>0.000*</b>
Males	43 (69.3)	50 (84.7)	43 (68.2)	6 (26.1)	
females	19 (30.7)	9 (15.3)	20 (31.8)	17 (73.9)	
<b>Cause of trauma</b>					<b>0.000*</b>
Motorcycle accident	8(15.09)	20(37.74)	22(41.51)	3(5.66)	
Fall on ground	17(32.69)	3(5.77)	16(30.77)	16(30.77)	
Car accidents	14(32.56)	19(44.19)	10(23.25)	0(0)	
Fall from height	10(58.81)	3(17.65)	4(23.54)	0(0)	
Direct trauma	4(25)	5(31.25)	5(31.25)	2(12.5)	
Fall down stairs	4(26.67)	6(40)	3(20)	2(13.33)	
Pedestrian	4(50)	3(37.5)	1(12.5)	0(0)	
Gun shot	1(50)	0(0)	1(50)	0(0)	
Train accident	0(0)	0(0)	1(100)	0(0)	

	Age groups n (%)				P value
	0-18y	19-30y	31-60y	>60y	
<b>Treatments</b>					<b>0.028*</b>
Operative	33(53.3)	48(81.4)	46(73)	14(60.9)	
Intervention	24(38.7)	11(18.6)	14(22.2)	7(30.4)	
Conservative	5(8)	0(0)	3(4.8)	2(8.7)	
<b>Total</b>	<b>62</b>	<b>59</b>	<b>63</b>	<b>23</b>	<b>207</b>

Figures of some patient admitted showing different types of fractures and the cause of them.

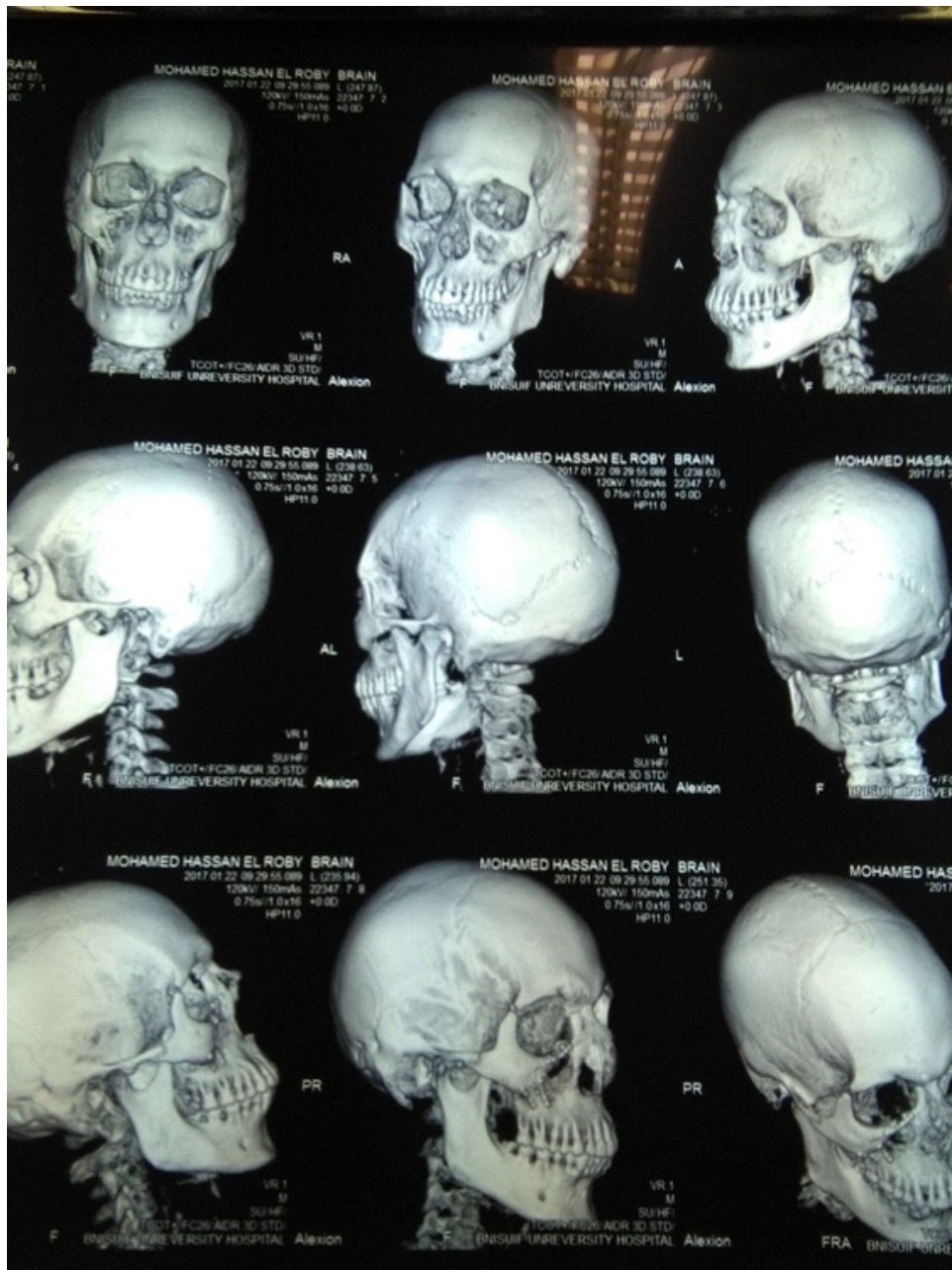


Figure 1: Show CT-scan 3D skull, male patient, 37y, and showing lateral wall fractures of Right orbit and anterior wall of maxilla after car accident.

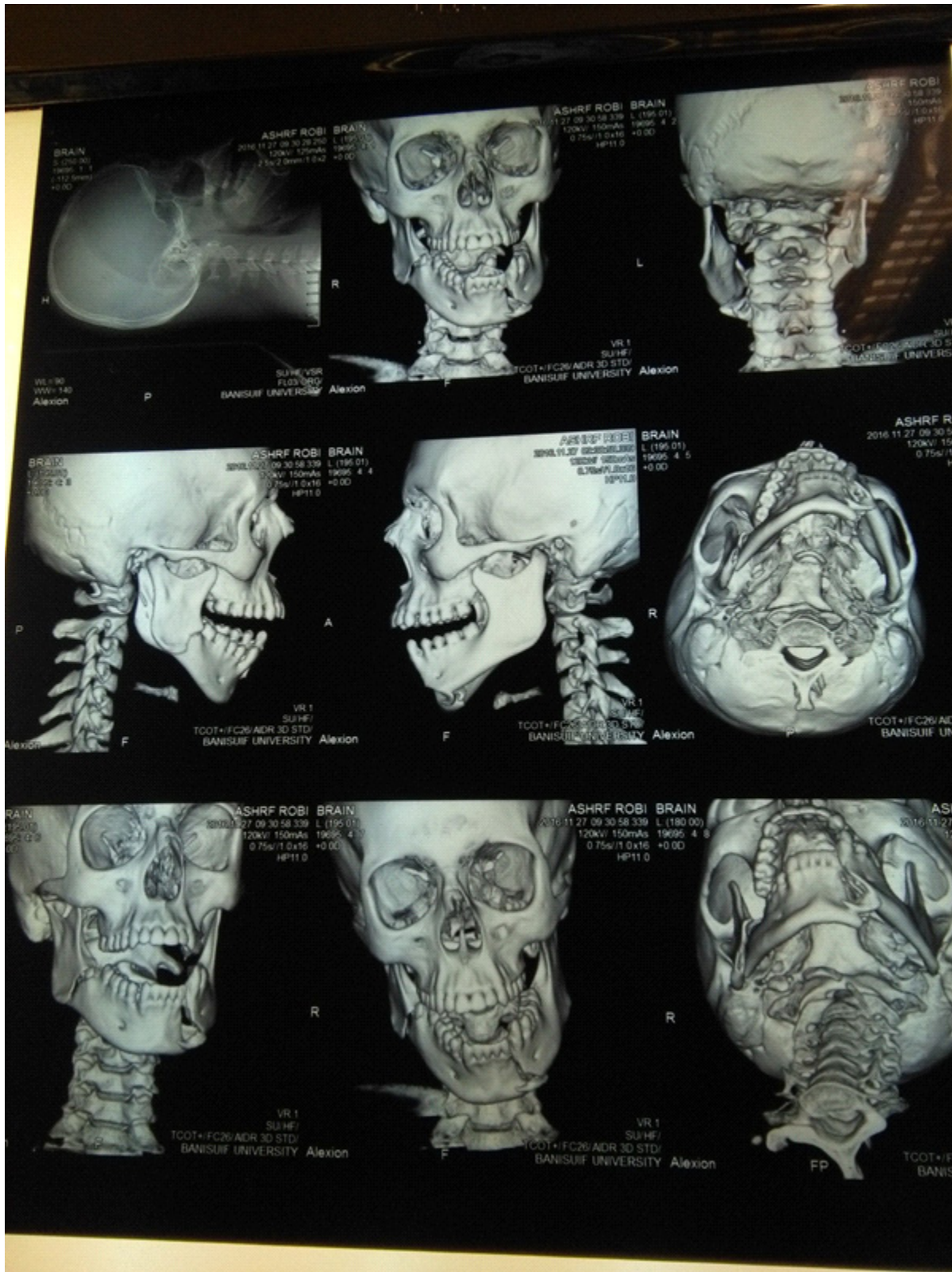


Figure 2: Show CT-scan 3D skull, male patient, 37y, and showing fracture of Right angle of mandible & Left parasymphyseal fracture after car accident.



**Figure 3: Show X-ray of lower limb, male, 22y, and show infected proximal femoral plate after car accident for more than two years.**

### Discussion

The present study revealed that males comprised most of the cases, as males represent 68.6%. Men are much more exposed to trauma possibly due to their active life styles and their relatively aggressive attitudes both in business and in their private lives. This result is agree with that reported by<sup>6,8&10</sup> which show that sex distribution was heavily skewed towards males.

The incidence of trauma in age group (31-60 years old) is higher than others because they are workers and more liable to trauma in work. As regard age group (0-18 years old), they came on the second and this could be explained by the fact that this has the age of adolescence and early youth where individuals start a more independent life thus exposing themselves to all sorts of violence. This result is in agreement with that reported by (Devarshi et. al., 2014) that show the lowest incidence of orthopedic trauma in old age. The result is against to that reported by (Gaurav et. al.,

2014) that show the maximum incidence in age group 19-30 years old.

There is increase in incidence among urban than patients in rural area as urban. This may be due to increase the activity in urban, most of work places are in urban area and they use different means of transportation that were the leading cause of orthopedic trauma. This result is against to that reported by<sup>4</sup>.

The most common cause of trauma is motorcycle accidents followed by fall on ground then car accidents. This is mainly due to lack of safety while driving motorcycle and high speed while driving. This result is agreed with that reported by<sup>17</sup>. But it is against the result reported by Gaurav et. al., 2014) which show that car accident is the most common cause of trauma.

As regard site of trauma, it was found that the most common site of orthopedic trauma is pelvis and lower extremities followed by upper extremities then skull injury. This is may be due to mode of trauma (mainly motorcycle accidents) that mainly affect lower extremities and cause fractures to them. This result is agreed with that reported by Taylor and Young which show that lower extremities is the most common site of trauma followed by lower extremities injury<sup>20</sup>. But it is against by that reported by Harry et. al., 2011 which show that upper extremities is the most common of orthopedic trauma<sup>11</sup>.

The most common type of fracture is simple fractures followed by comminuted fractures. This result coincide with the work of<sup>8</sup> that show the simple fractures are more common in orthopedic fractures.

As regard number of fractures, single fracture is the most common number of fracture occur after orthopedic trauma (71.5%) and the remaining is the multiple fractures (28.5%). This result coincide with the work of<sup>14</sup>.

Most of cases require operative treatment followed by intervention treatment and least cases need conservative treatment only. This result is in agreement with that reported by Somersalo et. al., 2014 that show most of cases of orthopedic trauma admitted to hospital need operative treatment<sup>2</sup>. This result is against to the data reported by Marc et. al.,

2013 as in their analysis of extremity fractures might partially have remained classified under conservative treatment just because patients never reached surgery due to cases of high mortality<sup>14</sup>.

As regard cases had orthopedic trauma associated with other injuries, most of cases had no other injuries, and wounds were the most common associated injuries followed by neurological injuries then abdominal injuries. This affected mainly by the modes of trauma which were different from case to another and as motorcycle accidents were the most common cause of fractures which lead to isolated fractures in most of cases. This result is in agreement with that reported by Hassan and Emara, 2015 as they told that most of cases had orthopedic fractures followed by general surgery as associated injury<sup>16</sup>.

In all age groups males were more than females except age group (>60y). This mainly due to increase incidence of osteoporosis in female patients after menopause which lead to increase fragility of bones and bone fracture from minor trauma. This result is in agreement with that reported by Sadat v et. al. 2015 & Taylor and Young 2015) as they show that there is an increasing incidence of elderly osteoporotic fractures in females<sup>17&20</sup>.

In fall from height, it was more common in age group (0-18y). As reported by<sup>12</sup> in their study about pediatric musculoskeletal injuries falls have been the most common mechanism of pediatric trauma and also reported by. In car accident, it was common in age group (19-30y) followed by age group (0-18y). This is in agreement with data reported by (Ganveer and Tiwari 2005) as they show that the majority of the victims after road traffic accidents were in the age group of 18-37 years. Direct trauma is equal in both age groups (19-30y) (31-60y) because they were the age groups of workers who were more susceptible to direct trauma during work. The most common age group came due to motorcycle accident was age group (31-60y) and least number in age group (>60y)<sup>9</sup>. This is against the data reported by (Amin et. al., 2011) as they show that the most common age group came with motorcycle accident is age 20-29y and there is increase in percentage of cases in age above 50y. In fall on ground, it was common in age group

(0-18y)<sup>1</sup>. Pedestrian trauma was more common in age group (0-18y) this is against that reported by (Mishra et. al., 2010) who show that Pedestrians represented the majority of victims sustaining injury as a result of being knocked by a vehicle, motorbike or cycle<sup>15</sup>.

It was found in the relation between age and treatment, cases who need operative treatment are more in age group (31-60y). While cases who need intervention are more in age group (0-18y) and they are also more in conservative treatment. There were different factors to determine treatment modality as site of fracture, type of fractures and general state of the patients. This result is coincide with the work of (Terje et. al., 2009) as they found that the Pediatric fractures were more likely to be treated conservatively with only (8%) requiring internal fixation, compared to (56%) internal fixation in those  $\geq 16$  years of age in their study on incidence of traumatic long-bone fractures requiring in-hospital management<sup>21</sup>.

## Conclusion

Trauma can affect different parts of the body: head, chest, abdominal region, extremities, face, spinal cord, the genitourinary system, pelvis, and soft tissues. Limb injuries are a common problem among the physically active, and such injuries may result in diminished performance, reduced participation, and in the longer term loss of function, chronic joint disease, and disability. Limb injuries represent the commonest form of injury involved in road traffic accidents.

**Abbreviations:** Not applicable.

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