Facial fractures and simultaneous lesions in traumatized patients

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Abstract

Trauma continues to be a major threatening for public health. Maxillofacial fractures often appear in multiple traumatized patients, with important and life threatening lesions. It is important to find out which this life threatening lesions are, to better treat and save the patient.

This clinical study was made in Emergency Clinical Hospital, in Bucharest, between December 1999 and December 2003, all the patients we had studied having a severity index score of the lesions greater than 12.

We had registered:the demography, the etiology and mode of presentation, the types of facial lesions and their associated lesions, the mode of diagnosis ant also their treatment and clinical or surgical evolution. (Revista de Medicină de Urgență, Vol. 3, Nr. 1: 8-11)



Introduction

The trauma continues to be a major threat for the public health. Maxilla-facial trauma appears in a considerable number of severe traumatized patients [1].

Knowing the life threatening associated lesions can conduct to a rapid evaluation and a good treatment of these patients.

Anyway, knowing the causes of these traumatisms and their specificity and severity may lead to improvement of prevention methods [2].

Road accidents and aggression remain the main causes of maxillofacial fractures.

Alcoholic intoxication at the time of the traumatic impact continues to be an important factor, together with the traumatism.

There had been documented serious concomitant lesions of the facial traumatized, studying facial fractures and concomitant lesions in severe traumatized patients [3].

Pulmonary and cerebral lesions are often associated with maxillofacial fractures in multiple traumatized patients.

Better knowing these associations is a base of a complex strategy of taking care of these patients and prevention of future complications.

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Therefore the multidisciplinary and coordinated approach of these patients is important for optimal stabilization and treatment of facial fractured patients.

Material and method

We had examined 170 of severe traumatized patients, with maxilla facial fractures, in Clinical Emergency Hospital of Bucharest, in a period of 4 years, between December 1999 and December 2003.

We had registered: patients age, sex, medium period of hospitalization duration, the traumatic mechanism, alcohol level facial fracture localization, concomitant lesions, interventions, complications, evolution of the patients or demise.

We had registered only the patients with an Index Severity Score of lesions greater than 12 (ISS > 12).

Each patient had facial fractures.

The precise localization of the facial fractures has been done by the computer tomography of facial bones. The fractures were considered to be complex if there were involved more than 2 facial bones.

Cerebral lesions were found also with the CT of the head, which often had revealed intracranial hematomas, cerebral edema or pneumoencephalocel.

A part of the patients we had studied had presented abdominal lesions: pelvic fractures and bleeding, hepatic, spleeny, mesenteric lesions that had been discovered during surgical consultation or in the operating room, during exploratory laparoscopy.

Pulmonary and vertebral lesions were confirmed by thoracic-pulmonary X-ray and thorax CT.

The interventions, complications, the patient evolution were registered from patient observation documents and surgical reports.

Results

170 of patients with facial fractures and an ISS more than 12 were included in this study.

From these, 151 (88, 8 %) were men and 19 (11, 2 %) females.

The subjects we had studied had ages between 2 and 75 years, with a medium of age of 36, 4 years.

So, we had 2 patients less than 10 years, 6 with ages between 10 and 15 years, 20 between 15 and 25 years, 40 with ages between 25 and 35 years, 53 between 35-45 years, 25 with ages between 45 and 55, 23 between 55-65 and only 2 between 65 and 75 years.

Frequency of facial fractures at different ages



The period of hospitalization was between 1 and 39 days, with a medium of 9,6 days.

The most frequent cause of the lesions was road accidents (35 %), followed by aggression (25%).



In 32, 4 % of patients we had documented and demonstrated alcoholically intoxication in the moment of presentation, because of medical and legal reasons. In the rest of the cases it had remained unknown or negative.

The statistical results were presented in this table:

Table 1.

Medium of age (years)	36
Extremities of age (years)	2 to 75
Females	19
Males	151
Medium of hospitalization (days)	9,6
Road accidents	60
Accidental hurting	25
Aggressions	44
Work accidents	34
Suicide	3
Other etiologies	4
Loss of conscience	89
Not known loss of conscience	26
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The orbit was the most affected facial bone (24, 2 %). These were followed by maxillary fractures (22%) and nasal fractures (19, 2 %). The most frequent isolated facial fractures were those of the nasal bones: 23, 2 %.

From all mandible fractures, only 5 were without any displacement. The remaining mandibulary fractures had requested surgical reduction and fixation.

From all frontal fractures, only 3 were only of anterior frontal sinus wall and without displacement. The rest of them affected both anterior and posterior wall of the frontal sinus and were treated by open reduction and internal fixation.

From all zygoma fractures, 8 were without displacement and were treated by open reduction and internal fixation.

Only 15 nasal fractures were with no displacement, the rest of 49 were displaced nasal bone fractures and were operated, by closed or open approach.

We had studied also maxillary fractures, LeFort fractures: 8 were not displaced and had been observed only and 49 had presented displacement and had been reduced by internal or external way.

In the case of orbital fractures, 24 were with no displacement and were clinically observed. The rest of them were surgically reduced on open or endoscopical way.

There were 15 cases of isolated orbital fractures: 1 of medial orbit wall fracture, 3 of inferior orbit wall fracture and 11 fractures of lateral orbital wall.

The naso-orbito-ethmoidal fractures were included in the category of complex nasal fractures.

Table 2.

	Complex fractures	81
IC	Orbital fractures URGENŢĂ	
	 Complex orbital fractures 	36
	• Isolated orbital fractures	15
-	Maxillary fractures	79
-	 Complex maxillary fractures 	68
t	• Isolated maxillary fractures	11
	Nasal fractures	69
	• Complex nasal fractures	53
	Isolated nasal fractures	16
	Zvgoma fractures	57
1	• Complex zygoma fractures	46
	Simple zygoma fractures	11
	Mandible fractures	40
	• Complex mandible fractures	27
	• Isolated mandible fractures	13
	Frontal fractures	25
	• Complex frontal fractures	22
	• Simple, isolated frontal fractures	3
	Palate fractures	2
	• Complex	2
	• Simple	0

Causes of facial fractures



Frequency of different facial fractures

The patient had presented also simultaneous lesions.

The most serious one was the intracranial hematoma. 43, 7 % of the patients from the study had presented isolated or combined intracranial hematomas. The subdural one was the most frequent, representing 41, 3 % of total intracranial bleeding.

The next one as frequency is subarachnoidian bleeding and intracerebral bleeding in 23, 8% and 16, 3% of cases, respectively.

Cerebral concussion was found in 15, 8% of patients as second only after intracerebral hematoma, as a severe simultaneous lesion.

Pulmonary lesions appeared in 31,1 % of patients. From these, 38% were pulmonary contusions and in 29% of cases there existed pneumothorax.

In 7,3% of patients were documented lesions of the cervical spine, with only 3 patients presenting neurological deficit because of these lesions.

Tabel 3.

Concomitent lesions:	
Cerebral	
• Hematoma	68
– subdural	35
 subarahnoidian 	19
 intracerebral 	13
– epidural	4
Concussion	26
Pneumoencephalus	12
• Edema	11
• Difuse traumatic brain injury	8
Respiratory lesions	
Pneumothorax	15
• Hemothorax	9
 Pumonary concussion 	19
Atelectasis	4
Pleural effusions	4
 Pulmonary infiltrate 	1

Abdominal lesions	
Pelvic fracture	9
• Liver lacerations	7
• Splenic lesions	5
Mesenterical lesions	1
Cervical spine lesions	
 Without neurological deficit 	10
• With neurological deficit	3
Major interventions included:	
• Intubations;	
• Tracheotomy	
• Craniotomy (in hematoma treatment or	
in cases with high intracranial pressure,	
for intracranial pressure monitoring.	
Thoracotomy	
Laparotomy	
• Vascular surgery.	

72 patients (42%) of patients had been intubated, in 22 (15%) of cases a tracheotomy was mandatory.

Thoracotomy was needed in emergency in 18 of the patients for pneumo or hemothorax.

9 (5,9%) of patients needed vascular reconstructive surgery and 6 (4%) needed emergency laparotomy.

In 37 patients cerebrospinal fluid pressure monitoring or cerebral hematoma evacuation was needed.

The rate of in hospital complications was about 50 %. The complications were:

• Pulmonary complications

• Sepsis

• Renal insufficiency ENTA

- Severe anemia
- Demise

The pulmonary complications were about 60% of total complications. 33 of patients (21,8%) had pneumonia, 3 had adult respiratory distress syndrome (ARDS), and 4 of the patients presented unspecified respiratory insuficiency.

Only 7 of patients had sepsis, 5 severe anemia and 4 renal insufficiency.

Frequency complications in facial fractures politraumatised patients



The evolution of the patiens was :

- 82 left the hospital;
- 43 were transferred to rehabilitations units ;
- 10 transfered to other hospitals;
- 3 left the hospital against medical advice ;
- 13 demise in the hospital

From all the patients, 55 had presented neurological deficits at the end of their hospitalization:

- Altered mental status;
- Cognitive delay;
- Disfagia;
- Hemiplegia;
- Peripherical nervous palsy;
- Important behavioral changes.

Mortality:

13 of patients had died during their hospitalization: 11 because of neurological causes, 1 of lung insufficiency and 1 because of sepsis.

Discussions

The patients with facial fractures usually present different other simultaneous, severe lesions. We took into considerations only the patients with a Index Severity of the lesions greater than 12.

ISS is a valid classification of the severity of the lesions in traumatized patients, made by Baker [3]. The system uses a combination of lesions in 3 different regions of the body.

Patients with ISS>12 are considered severe traumatized.

The study shows that road accidents and aggression are the main causes of these lesions and alcoholic intoxication is frequent implicated as an important factor.

Orbital fractures (24%) and maxilla (22%) fractures are the most common facial lesions.

Other studies had found that mandible fractures are most frequent (33-76%), but we had included in the study only severe traumatized patients.

Some authors consider that the frequency of orbital fractures is grater than 35 % in their papers [4].

Interesting, nasal bone fractures were the most common isolated fractures. This fact indicates that orbital and maxilla fractures frequent appear in complex facial fractures.

The recognition of associated lesions in facial fractured patients is important for a good treatment.

Cerebral lesions are most frequent associated. Cerebral lesions were documented in more that 80% of patients. 11 from 13 demises in study were because of neurological causes and some of the patients had needed intracranial pressure monitoring or hematoma evacuation.

This indicated the need for neurosurgical approach in facial traumatized patients.

Pulmonary lesions were the second associated lesions, abdomino-pelvic lesions being the third lesions associated. In some patients cervical spine lesions with or without neurological deficits were documented. The number of cases presenting cervical fracture were only 13, with only 3 presenting neurological deficits. The number of patients with cervical spine fractures and neurological problems was much greater in Lewis and Manson papers [5].

These results underscore the importance of head and neck CT, lung and thorax X-ray in facial traumatized patients as was mentioned by Dolan and Jacoby in their articles [6, 7].

The most important fact this study shows is the importance of a multidisciplinary approach of a facial traumatized patient. Maxilla facial, ENT surgeons must do their work together with the neurosurgeon, general surgeon and an anesthesiologist. Only this good coordinated team work will considerably improve patient condition, leading to his proper healing.

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Documentation of the lesions associated with facial fractures offers important strategies in dealing with the patient and preventing future complications.

The study shows that cerebral and lung lesions are often associated with facial fractures.

The good coordination of surgical teams is vital for proper and rapid stabilization of facial traumatized patients.

Because of great in hospital complications a good diagnosis and treatment of associated lesions is mandatory in morbidity and mortality evolution of these cases.

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