Our Experience in the Treatment of Severe Thoracic Trauma.

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Abstract

Background: Severe thoracic trauma is the main cause of deaths in US about 10-20%. Causes of severe thoracic Trauma are: Penetrating trauma, Gunshot wounds, Stab wounds; Gunshot wounds on the chest is the most lethal – 50%. Only 7-10% undergoes hospitalization prior to death. Death occurs due to heart & great vessel injuries.
Aim of study: Analyses the patients with Severe Thoracic Trauma, Initial Evaluation and Management in the period of time 2004-2017 treated in thoracic surgery service.
Material and methods: Patents treated in our hospital during July 2004 - July 2017 are 95. Male to female ratio was 3:1. Age of presentation 9-71 years old, mean age 49 years old. Blunt chest wall trauma 36 (38%) and penetrating chest wall trauma 59 (62%) patients. Ribs and sternal fractures, two or more costal fractures in 15 (15.7%) patients (flail chest 7 patients); unilateral pneumothorax 34 (35.7%) patients, bilaterally pneumothorax 10 (10.5%) patients; massive hemothorax 12 (12.6%) patients, pneumomediastinum et subcutaneous emphysema 6 (6.31%) patients Hamman's syndrome, lung contusion and parenchymal pulmonary hematoma in 15 (15.7%) patients; bronchial rupture 2 (2.1%) patients, tracheal rupture 1 (1%) patient.
Results: Conservative treatment in 22 (23%) patients, unilateral pleural tub drainage 42 (44%) patients, bilateral chest drainage 18 (18.9%) patients; thoracotomy in 29 (30.5%) patients, wedge resection, lung hemostasis and aerostasis from lung lacerations, bronchial lobar rupture left lower lob 1 (1%) patient, bilateral thoracotomy 3 (3%) patients, clamshell incision in 1 (1%) patient; thoraco-abdominal approach 2 (2%) patients. flail chest wall stabilization 7 (7.3%) patients by vicryl suture, steel wire suture 3(3%) patients, titanium plate 3(3%) patient. By VATS are treated 2(2.1%) patients. Mean hospital stay was 11 days (average 3-36 days). Morbidity rate in 6 (6.3%) patients, mortality was on 5 (5%) patients.
Conclusion: Most common injury locations was lung and chest wall and less common abdominal and cranial trauma. Surgical and intensive treatment are very important and with low mortality rate.
Key words: penetrating thoracic injury, blunt trauma of chest wall, surgery treatment.

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Full Text

Introduction

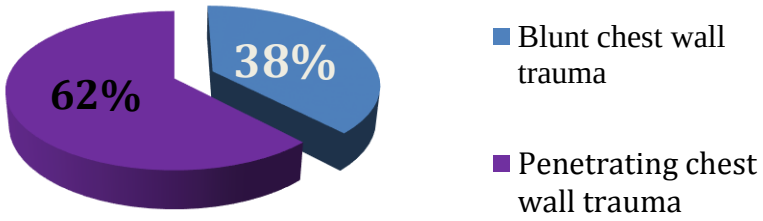
Trauma is a major public health problem worldwide as it is associated with high morbidity and mortality both in developed and developing countries.
Thoracic trauma accounts 10-15% of all traumas (1). Thoracic trauma directly accounts for approximately 25% of trauma related mortality and is a contributing factor in another 25% (2)
The etiological pattern of chest trauma varies worldwide with many environmental and socio-political factors. Road traffic accidents (RTAs) remain the cause of most chest trauma in non-war zones.
In this retrospective study, we present our 14 – year experience in the management and clinical outcome of severe thoracic trauma.

Materials and Methods

In our study we included all patients who were hospitalized due to chest injuries between July 2004 to July 2017 (a total of 95 of consequent cases).
The hospitalization criteria were intra-thoracic injury, clinically significant rib cage injury (even one rib fracture), or clinical suspicion of significant thoracic injury like subcutaneous emphysema. We excluded from our study all patients who arrived dead or died immediately in the emergency room, patients who did not complete their treatment in our hospital, isolated laryngeal or cervical injuries, esophageal and tracheal injuries due to foreign body swallowing or aspirating, and non-traumatic injuries to the chest (burns, electrical shocks, etc.)
The injured patients were first triaged by a specialist in emergency medicine in the emergency department. Patients were then referred to the thoracic surgeon if needed. Patients with poor condition or those with flail chest were admitted to the ICU and mechanical ventilation was used for respiratory deficiency or severe neurotrauma. All patients had analgesics, and mucolytic treatment, provided with respiratory physiotherapy.

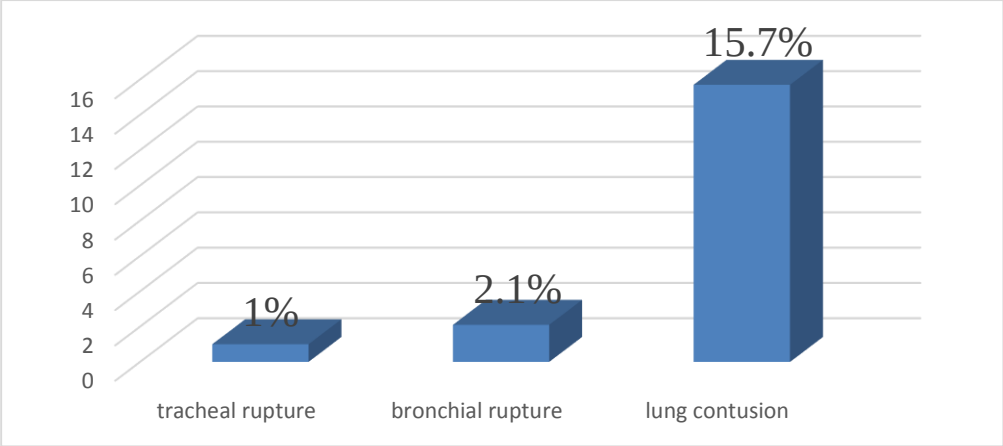
Results

95 cases were hospitalized and treated. Male to female ratio was 3:1. Mean age at the presentation was 49 ± 18 years (range 9 - 71 years).

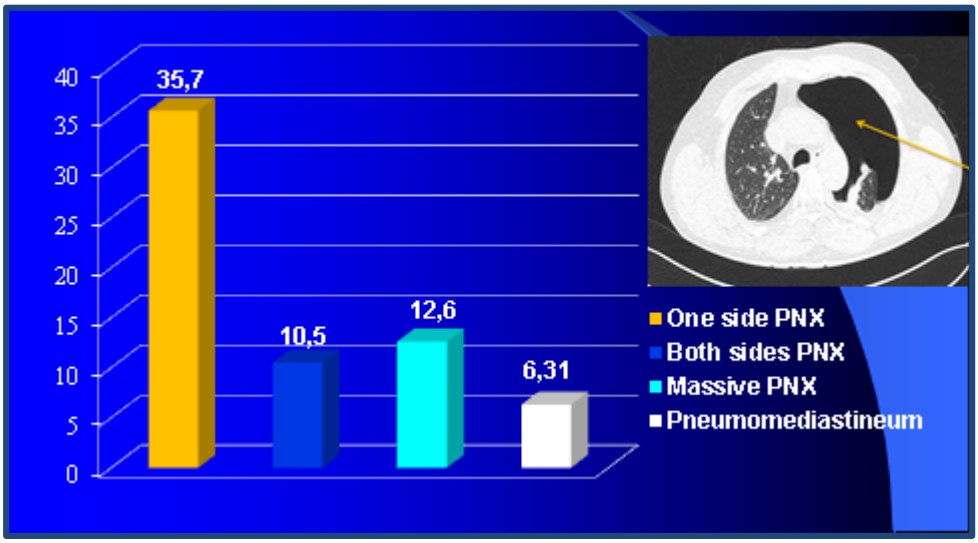


Graph 1

Ribs and sternal fractures: two or more costal fractures in 15 pts (15.7%), flail chest: 7 patients. Further results are presented in details in the consecutive graphs and tables ***(Graph 1,2,3)***



Graph 2



Graph 3

Treatment approach consisted in conservative in 23 % (n= 21) of cases and surgical treatment in 77 % (n=74) of all cases(***Figure 5).*** Unilateral pleural tub drainage ***(Figure 1)*** applied in 42 (44%) pts, bilateral chest drainage in 18 (18.9%) patients ***(Figure 6)*** and bronchial lobar suture left lower lob was applied 1 (1%) patients***(Table1).***

Mean day hospital was 11±12.4 days (average 3-36 days).Morbidity rate in: 6 (6.3%) patients and mortality was on 5 (5%)patients.

	Patient nr. %
Thoracotomy unilateral thoracotomy bilateral thoracotomy	29 (30.5%) 26 (27%) 3 (3%)
Clamshell incision	1 (1%)
Flail chest wall stabilization by vicryl suture steel wire suture 3(3%) patients,titanium plate 3(3%)	7 (7.3%) 1 (1%) 3 (3%) 3 (3%)
Thoraco-abdominal approach	2 (2.1%)
VATS	2 (2.1%)

Table 1

Figure 1

Figure 2

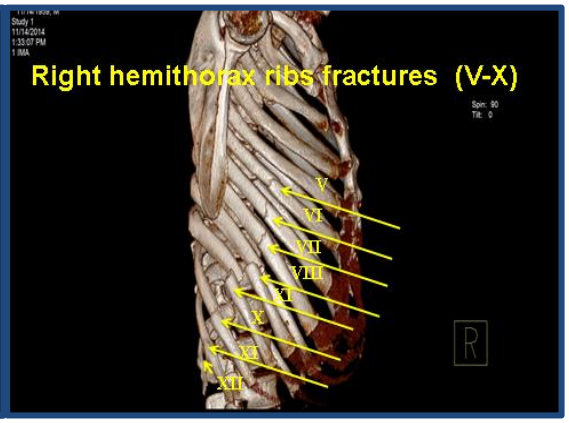


Figure 3

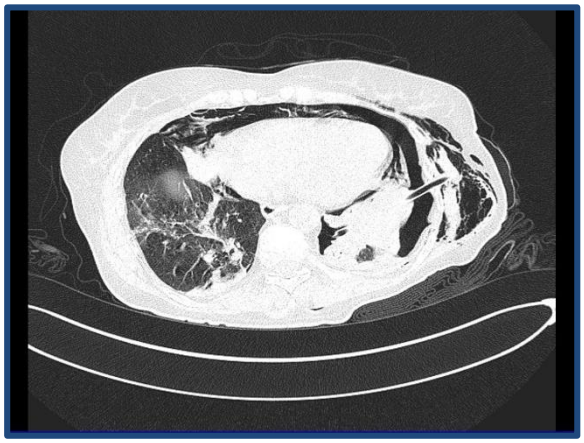


Figure 4: *Both sides Pneumomediastinitid and left sided PNX ; Post pleural drainage*

Figure 5: *Clamschell approach*

Figure 6: *Thoracic double drainage*

Discussion

Trauma has the tendency to affect young males in the productive period of life (3), (4), (5).
Many series derived from the Middle East region had even younger patients (6), (7), (8), (9) comparing to studies done in the developed countries (10), (11), (12).
Blunt trauma was more frequent than penetrating trauma in our series which is compatible with other series (12).
Rib fractures occurred in 34% of patients and was the most common type of injury due to blunt trauma in our series which was comparable with other series (13), (14).
Flail chest was diagnosed in (n = 7) all of them were adults.

Conclusions

Chest trauma is a major health problem since it has high morbidity and mortality rate. Most common injury locations was lung and chest wall and less common abdominal and cranial trauma .
Surgical and intensive treatment are very important and with low mortality rate**.**

References

1. Demirhan R, Onan B, Oz K, Halezeroglu S: Comprehensive analysis of 4205 patients with chest trauma: a 10-year experience. Interact Cardiovasc
Thorac Surg 2009, 9(3):450-453.
2. O'Connor JV, Adamski J: The diagnosis and treatment of non-cardiac
thoracic trauma. J R Army Med Corps 2010, 156(1):5-14
3. 5.Mefire AC, Pagbe JJ, Fokou M, Nguimbous JF, Guifo ML, Bahebeck J: Analysis of epidemiology, lesions, treatment and outcome of 354 consecutive cases of blunt and penetrating trauma to the chest in

an
African setting. S Afr J Surg 2010, 48(3):90-93.
4. Lema MK, Chalya PL, Mabula JB, Mahalu W: Pattern and outcome of chest
injuries at Bugando Medical Centre in Northwestern Tanzania. J
Cardiothorac Surg 2011, 6:7.
5. Liman ST, Kuzucu A, Tastepe AI, Ulasan GN, Topcu S: Chest injury due to
blunt trauma. Eur J Cardiothorac Surg 2003, 23(3):374-378.
Al-Koudmani et al. Journal of Cardiothoracic Surgery 2012, 7:35
http://www.cardiothoracicsurgery.org/content/7/1/35
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6. Hanafi M, Al-Sarraf N, Sharaf H, Abdelaziz A: Pattern and presentation of
blunt chest trauma among different age groups. Asian Cardiovasc Thorac
Ann 2011, 19(1):48-51.
7. Zargar M, Khaji A, Karbakhsh Davari M: Thoracic injury: a review of 276
cases. Chin J Traumatol 2007, 10(5):259-262.
8. Yalçinkaya I, Sayir F, Kurnaz M, Cobanoğlu U: Chest trauma: analysis of 126
cases. Ulus Travma Derg 2000, 6(4):288-291.
9. Demirhan R, Küçük HF, Kargi AB, Altintaş M, Kurt N, Gülmen M:
15. 33.
Evaluation
of 572 cases of blunt and penetrating thoracic trauma. Ulus Travma Derg
2001, 7(4):231-235.
10. Segers P, Van Schil P, Jorens P, Van Den Brande F: Thoracic trauma: an
analysis of 187 patients. Acta Chir Belg 2001, 101(6):277-282.
11. Kulshrestha P, Munshi I, Wait R: Profile of chest trauma in a level I trauma
center. J Trauma 2004, 57(3):576-581.
12. Pamerneckas A, Pijadin A, Pilipavicius G, Tamulaitis G, Toliusis V, Macas A,
Bilskiene D, Blazgys A: The assessment of clinical evaluation and
treatment results of high-energy blunt polytrauma patients. Medicina
(Kaunas) 2007, 43(2):137-144.
13. Cakan A, Yuncu G, Olgaç G, Alar T, Sevinç S, Ors Kaya S, Ceylan KC, Uçvet A:
Thoracic trauma: analysis of 987 cases. Ulus Travma Derg 2001, 7(4):236-241.
14. Veysi VT, Nikolaou VS, Paliobeis C, Efstathopoulos N, Giannoudis PV:
Prevalence of chest trauma, associated injuries and mortality: a level I
trauma centre experience. Int Orthop 2009, 33(5):1425-14