

Epidemiology of Chest Injury in Long Bone Fractures in Road Traffic Accident Cases

Rajib Debnath¹, Abantika Nath², Chayan Sarkar³

¹Associate Professor, Department of Orthopaedic, Tripura Medical College & DR BRAM Teaching Hospital, Hapania

²Senior resident, Department of General Surgery, Agartala Government Medical College, Agartala

³Assistant Professor, Department of Paediatric, Agartala Government Medical College, Agartala

Received: 06-02-2026 / Revised: 16-03-2026 / Accepted: 06-04-2026

Corresponding Author: Dr. Rajib Debnath

Conflict of interest: Nil

Abstract

In modern day trauma centres, chest injury directly accounts for 20-25% of deaths due to trauma; chest injury or its complication are a contributing factor in a further 25% of trauma deaths. Approximately 85% of all chest trauma can be managed without surgical intervention, the mainstay of management is supplemental oxygen, intercostals drainage, good physiotherapy and pain control.

Methods: Total 78 patients (62 males and 16 females) who met the inclusion and exclusion criteria between August 2014 and March 2015 were included in this study. History, general and local examination, x-ray (local injured area and chest), CT SCAN of chest was done. All patients evaluated at the time of presentation. Secondary outcome measured by operative procedure delay, preoperative, intra operative and post-operative morbidity.

Results: After analysis, we had 35% patients diagnosed as one or multiple type chest injuries those who have long bone fractures and 79% patients was managed without surgical intervention. The mainstay of treatment was supplement oxygen, intercostals drainage, good physiotherapy and pain control. 7% of all long bone fractures had severe chest injuries which was treated on emergency basis in the casualty. Whereas 13 patients (16%) had chest injuries which increases preoperative, intra operative and post-operative complications and also increases hospital stay. Around 9% (7 patients) chest injuries leads to delay in operative procedure.

Proper examination of chest along with local examination of injured part in road traffic accident cases needed to diagnosis neglected or minor chest injuries which increases morbidity of the patient.

Keywords: Chest injury, Long bone fractures, Road traffic accident.

MeSH terms: Chest, Fractures, Long Bones.

DOI: 10.25258/ijcpr.18.4.257

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Along with industrialization, scientific and technological development in the recent century, trauma and its complications have become an important issue, as it is one of the most prevalent causes of fatalities and morbidity worldwide, particularly in developing and developed countries [1]. Trauma is the fourth cause of mortality in individuals under 45 years of age, the third main cause of death in all age groups, and it is the second cause of death among young people [2]. Despite remarkable developments in trauma management, it is still a significant cause of mortality. Therefore, trauma is a major hazard in every society, which affects health, economic and social indicators [3].

Chest trauma in particular, have been increasing steadily following a surge in vehicle numbers that have led to an increase in road accidents, along

with other long bone fractures in growing urbanization and industrialization related problems [4]. Based on WHO (World Health Organization) predictions, road traffic accidents will become the second cause of premature death in the world by 2020 [5]. Chest trauma is an important cause of mortality and morbidity, and it stands in the third global place after cancer and cardiovascular diseases [4, 6]. It has been declared that 20 - 25% of fatalities in trauma patients are related to chest injuries [7]. 85% of chest trauma can be managed without surgical intervention, the mainstay of management is supplement oxygen, intercostals drainage, good physiotherapy and pain control. Chest injury along with long bone fractures increases preoperative, intraoperative, post

operative complications, even delays the operative procedure and increases hospital stay.

Aim of the Study

The aim of this study was to find out the incidence of chest injury in patients with long bone fractures after high velocity injuries.

Material and Methods

This prospective study includes 78 patients having long bone fractures after road traffic accident operated between august 2014 to March 2015 in casualty of Adichunchanagiri Hospital and Research centre (AHRC), B.G. Nagara, Nagmangala.

History, general and local examination, xray and ct scan of chest with other injured part of body was done. Blood investigation, ECG also done for operative procedure. Blood saturation was measured using pulse oximeter. Patients was examined at the time of presentation for proper

diagnosis of major or minor or neglected chest injury.

Inclusion Criteria

1. Patient having long bone fractures after road traffic accident.
2. Patients below 60 years.

Exclusion Criteria

1. Patient having previous history of lung disorder.
2. Pathological fracture
3. Osteoporotic fractures
4. Fracture in children
5. Old fractures
6. History of previous chest injury
7. Moderate to severe head injury (Glasgow coma scale <10)

Age Distribution

Among those selected 78 patients, 62 males and 16 females

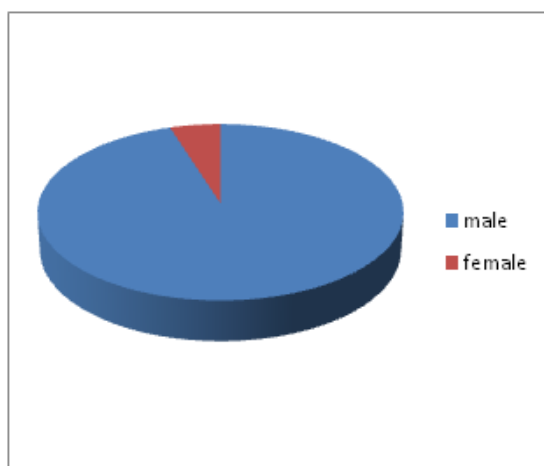


Figure 1: Sex Distribution

Where 27 patients (21-30 years), 21 patients (31-40 years), 18 patients (41-50 years), 12 patients (51-60 years) and mean age 37.14 years.

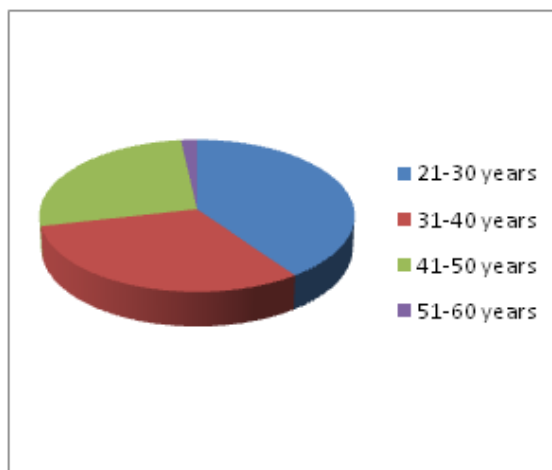


Figure 2: Age Distribution

Long bone fracture distribution among these 78 patients were shaft femur fracture (20), supracondylar femur fractures (11), tibial plateau fractures (16), tibial shaft fracture (23), humerus fracture (8).

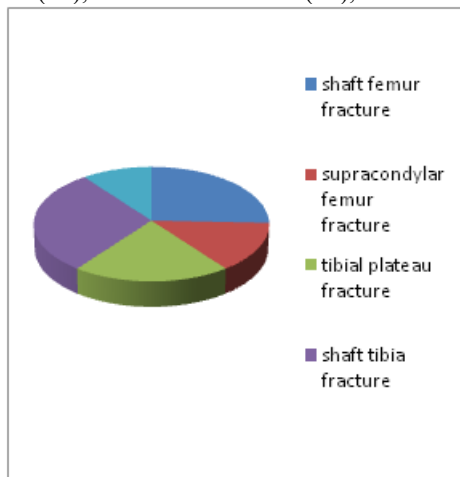


Figure 3: Long Bone Fractures

out of the 78 patients 28 had chest injury, of these rib fractures in (14), pneumothorax in (6), haemothorax in (4), lung contusion in (3), cardiac tamponade in (1) was diagnosed by clinical examination, chest x-ray, CT scan of chest, ECHO cardiography in one case.



Figure 4: X-RAY showing 34 year male with supracondylar femur fracture left side



Figure 5: X-RAY showing 28 years male patient with right tibia shaft fracture

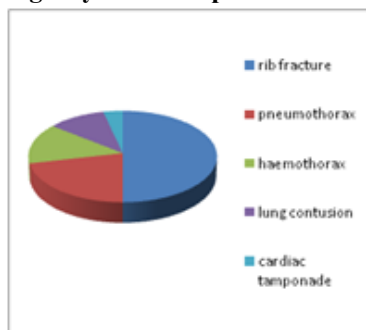


Figure 6: Chest Injuries

Means 17% rib fracture, 7.69% pneumothorax, 5.1% haemothorax, 3% lung contusion, cardiac tamponade 1.28%.



Figure 7: CT SCAN showing left sided pneumothorax in 30 year male diagnosed as midshaft tibia fracture of right side



Figure 8: CT SCAN showing left sided pneumothorax in 24 year female patient diagnosed as shaft femur fracture of left side



Figure 9: CT SCAN shows right sided haemothorax in 46 year male diagnosed as comminuted left tibial plateau fracture

Complication

Major complications were noted in 6 patients (2 rib fracture, 2 pneumothorax, 1 haemothorax, 1 cardiac tamponade).

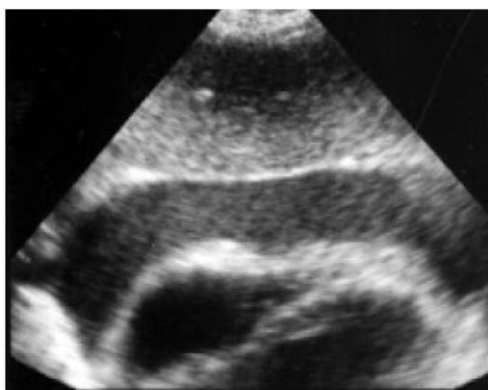


Figure 10: ECHO cardiography showing cardiac tamponade in 32 year male patient diagnosed as supracondylar femur fracture left

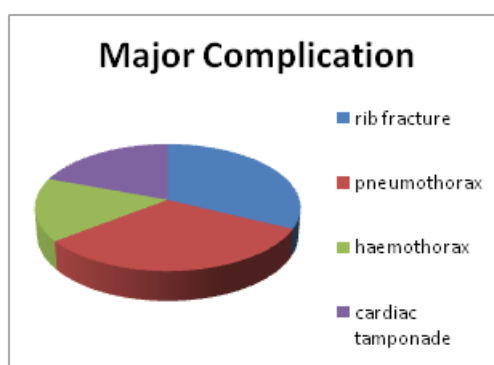


Figure 11: Major complication

Cardiac tamponade patient presented with low blood pressure, raised jugular venous pulsation and typical ECG finding and diagnosed by ultrasonography. 2 pneumothorax patients presented as severe dyspnea, diagnosed by needle insertion. 1 haemothorax patient also presented with severe dyspnea and 2 patients with multiple rib fracture. out of those 10 patients (6 pneumothorax, 4 haemothorax) 4 patients treated with ICD insertion.

Results

In modern day trauma centres, the ratio of trauma affected men was 3.6 times more than women [9]. But in our study male are 4.42 times more affected than females. After road traffic accident patients presented with long bone fractures also had chest injuries in around 35%, which may be significant or may not be whereas in other study it was around 20-25% [7]. In a study by Ahmadi et al., most of the chest traumatic patients were adult men with a mean age of 35 years and road accidents were the most prevalent cause of trauma [1]. In our study mean age is 37.14 years. Sometimes chest injury may be incidental finding, rarely cause of death. According to other study, it has been declared that 20 - 25% of fatalities in trauma patients are related to chest injuries [7]. 85% of chest trauma can be managed without surgical intervention. But in this study 35% patients diagnosed as one or multiple type chest injuries those who have long bone fractures and 79% patients was managed without surgical intervention. The mainstay of treatment was supplement oxygen, intercostals drainage, good physiotherapy and pain control. 7% of all long bone fractures had severe chest injuries which was treated on emergency basis in the casualty. Whereas 13 patients (16%) had chest injuries which increases preoperative, intraoperative and postoperative complications and also increases hospital stay. Around 9% (7 patients) chest injuries leads to delay in operative procedure.

Conclusion

Chest injury associated with long bone fractures in road traffic cases increases pre operative, intra operative and post-operative complications. Even chest injury delays the operative procedure as well as increases morbidity and hospital stay of the patients. We recommended proper chest examination along with local examination in long bone fracture cases for early diagnosis and neglected chest injury cases to decrease further complications.

Limitation

The limitation of this study was a small sample size, short duration of study.

Reference

1. Ahmadi Amoli H, Zafarghandi MR, Tavakoli H, Davoodi M, Khashayar P. Thoracic Trauma: Severity of Injury in 342 Patients. TUMJ. 2009;66(11):831-4.
2. Moti MR, Behnampour N, Alinezhad H. Epidemiology of Blunt Abdominal Trauma in Gorgan-Iran (2001-05); Short Communication. J Gorgan Uni Med Sci. 2009;10(4 (28)):55-9.
3. Gad MA, Saber A, Farrag S, Shams ME, Ellabban GM. Incidence, patterns, and factors predicting mortality of abdominal injuries in trauma patients. N Am J Med Sci. 2012;4(3):129-34.
4. Khan IA, Ghaffar S, Asif S, Zia ur R, Asad S, Ahmed E, et al. Management of thoracic trauma: experience at Ayub Teaching Hospital, Abbottabad. J Ayub Med Coll Abbottabad. 2009;21(1):152-4.
5. Krug EG, Sharma GK, Lozano R. The global burden of injuries. Am J Public Health. 2000;90(4):523-6.
6. 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):90-3.
7. 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):1425-33.
8. Veysi T, Veysi, Vassilios S, Nikolaou, Christos Paliobeis, Nicolas Efstathopoulos, and Peter V. Giannoudis: Prevalence of chest trauma, associated injuries and mortality: a level I trauma centre Experience. Int Orthop. 2009 Oct; 33(5): 1425–1433.
9. Yousefzadeh S, Ahmadi Dafchahi M, Mohammadi Maleksari M, Dehnadi Moghadam A, Hemati H, Shabani S. [Epidemiology of Injuries and their Causes among Traumatic Patients Admitted into Poursina Hospital, Rasht (second half of the year 2005)]. Behboud. 2007;11(34):286-95.