

Chest injuries in Tikur Anbessa Hospital, Addis Ababa: a three year experience

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A review of 72 patients with chest injuries admitted to Tikur Anbessa Hospital in Ethiopia between February 1996 and February 1999 was undertaken. All but one patient were treated with chest drainage. Approximately 85% of the patients were successfully treated with chest drains leaving no residual defects. This simple, effective and affordable equipment should be made available in all hospitals. Chest drainage is a life-saving procedure for patients with chest injuries which all doctors should be confident with.

Introduction

Trauma is a leading cause of death, hospitalization, and long-term disabilities in the first four decades of life. Of all trauma deaths, 25% result from chest injuries alone¹. A significant number of those who sustain chest trauma, especially with injuries of the heart, pericardium and great vessels, die before reaching medical facilities². The management of traumatic chest injuries has been studied in the USA and well researched protocols exist for guidance regarding its treatment³. Similar studies were done in Ethiopia by Gizaw Tsehay and Lambrecht^{4,5}. These revealed that non-operative or simple chest drain tube drainage was sufficient in 72% of patients who reported to the Armed Forces General Hospital,

Addis Ababa and in 78% of patients who reported to Gondar College of Medical School Hospital.

In the USA, 85% of patients with chest trauma were treated adequately with procedures that should be available in hospital emergency units⁶. Simple pneumothorax and a small haemothorax are best managed with chest drainage and observation. In cases of large haemothorax requiring volume replacement to maintain cardiovascular stability, thoracotomy may be necessary to attain haemostasis⁷. In war situations, 90% of chest wounds can be treated by drainage of the pleural cavity and excision of the wound of the chest wall.

This article describes our experience in the management of chest injuries in Tikur Anbessa Hospital Department of Surgery, Addis Ababa University, based on 72 chest injuries seen between February 1996 and February 1999.

Patients and methods

This was a retrospective analysis of 72 patients with chest injuries admitted to the Tikur Anbessa Hospital, Department of Surgery over a three year period. Data were collected from patients' records and operation theatre registers. The records were reviewed for demographic information, type of injury, clinical features, chest x-ray findings

associated injuries, management, complications and duration of hospital stay. Tikur Anbessa Hospital is the largest and main referral centre in Ethiopia, with a surgical bed capacity of 250.

Results

During the period under review, 72 patients were subjected to chest tube drainage. The patients' ages ranged between 2-58 years with a mean of 25.3 years.

TABLE 1 Age and sex distribution

Age in yrs	Male	Female	Total	%
0 - 1 0	2	2	4	5.6
1 1 - 2 0	1 9	3	2 2	30.5
2 1 - 3 0	2 9	-	2 9	4 0.3
3 1 - 4 0	7	-	7	9.7
4 1 - 5 0	6	-	6	8.3
5 1 - 6 0	3	1	4	5.6
TOTAL	6 6	6	7 2	100.0

TABLE 2 Types of injury

Injury	Male	Female	Total	%
Stab	3 5	1	3 6	50.0
Bullet	1 5	1	1 6	2 2.3
Blunt	1 4	4	1 8	2 4.9
Blast	2	-	2	2.8
TOTAL	6 6	6	7 2	1 0 0.0

The majority of patients were aged between 11- 30 years accounting for 70.8% of all cases (Table 1).

Penetrating chest injuries accounted for 75% of the injuries (Table 2). The presenting clinical features are summarized in Tables 3 and 4. The majority of the patients had the haemopneumothorax diagnosed by clinical and X-ray findings (Table 5). Fourteen

TABLE 3 Symptomatology

Symptom	No of patients	%
Chest pain	7 2	1 0 0.0
Shortness of breath	6 6	9 1.7
Bleeding from injury site	2 5	3 4.7
Fever	5	6.9
Cough	3	4.2

TABLE 4 Clinical Findings

Signs	No of patients	%
Signs of fluid collection	6 5	9 0.2
Subcutaneous emphysema	1 6	2 2.2
Fractured ribs	1 2	1.7
Hypovolaemic or septic shock	6	8.3
Respiratory distress	6	8.3
Adventitious breath sounds	6	8.3
Signs of air collection	5	6.9
Tracheal shift	5	6.9
Flail chest	1	1.4

TABLE 5 Chest X-ray findings

Findings	No of patients	%
Haemopneumothorax	4 8	6 6.7
Haemothorax	1 7	2 3.6
Pneumothorax	6	8.3
Pneumomediastinum	1	1.4
TOTAL	72	100.0

patients (19.4%) had associated injuries. Abdominal injuries occurred in 7 (5.6%), skeletal in 4 (5.6%) and neurological injuries in three (4.2%).

All patients required chest tube drainage, of whom 60 (83.2%) were treated with chest tube drainage alone while 7 (9.8%) had a laparotomy in addition to the intrapleural drainage. Four (5.6%) of the patients had skeletal traction, one of whom had a skeletal fracture treated with traction and a head injury for which burr holes were done (Table 6). One patient had a delayed thoracotomy.

TABLE 6 Type of Management

Procedure	No of patients	%
Chest tube alone	6 0	8 3.2
Laparotomy + chest tube	7	9.8
Skeletal traction + chest tube	3	4.2
Traction + burr holes+ chest tube	1	1.4
Thoracotomy	1	1.4
TOTAL	7 2	1 0 0.0

Sixty (83.2%) of the patients recovered fully without any residual effects. Seven (9.8%) had complications (Table 7). There were 5 deaths, giving a mortality rate of 7%. Table 8 summarizes the duration of hospital stay. It ranged between 4 and 60 days, with a mean of 11.8 days. Over half (55.5%) of the patients had a hospital stay of 10 days or less. Only two patients stayed in hospital for longer than 40 days.

TABLE 7 Postoperative complications

Complication	No of patients	%
Pneumonia + sepsis	2	2.8
Empyema	2	2.8
Pneumonia alone	1	1.4
Medastinitis	1	1.4
Epidural haematoma + coning	1	1.4
TOTAL	7	9.8

TABLE 8 Hospital stay

No of days	No of patients	%
0 - 10	40	55.5
11 - 20	25	34.7
21 - 30	3	4.2
31 - 40	2	2.8
41 - 50	1	1.4
51 - 60	1	1.4
TOTAL	72	100.0

Discussion

This retrospective review of 72 cases demonstrated that the majority of patients presenting with chest injury can be treated with simple pleural cavity drainage. This and other studies from Ethiopia, Vietnam, Israel, Europe and the USA show that chest trauma can be managed with procedures which can be readily performed in rural hospitals by well trained junior surgeons or experienced general practitioners using simple equipment such as chest tubes and underwater seal bottles^{2,4,6,9,10}.

Even in developed countries, the trend is towards conservative management^{4,6,9}. All patients with chest trauma, except those who are severely injured,

should have a chest radiograph in an erect position. A supine X-ray is taken when the patient's condition is too critical to permit an erect radiograph. In all of our patients, chest X-rays were diagnostic.

The injuries commonly causing ventilatory impairment include multiple rib fractures in elderly patients and flail chests. In this review, 12 (17%) of the patients had one or more fractured ribs on one side which was tolerated after administration of analgesics. Only one patient (1.4%) had a flail chest which was managed in the surgical intensive care unit using mechanical ventilation. Lambrecht and Nicodemos in Gondar College of Medical Sciences Hospital found rib fractures in 68% of their patients. The difference in these two Ethiopian studies may be attributed to the fact that our cases were mainly civilians while their patients were mostly soldiers from combat areas.

The majority of our patients (66.7%) had a haemopneumothorax which was in agreement with previous findings from Ethiopia and Europe⁵. Associated injuries were reported from Ethiopia in 1980 and in 1989 respectively^{4,5}. In those earlier studies, the majority of the patients were injured by high velocity missiles at the warfront, causing extensive and multiple injuries. Studies done in developed countries showed similar or even lower rates of associated injuries⁶. Intra-abdominal injuries involving one or more organs or systems should be looked for in cases of chest injury and in this study nearly 10% of patients sustained such injuries.

All the patients under review had pleural cavity drainage except one who had a delayed thoracotomy for evacuation of a clotted haemothorax. This study confirmed that the majority of civilian chest injuries can be managed successfully with a simple chest tube drain. Therefore this simple, effective and affordable equipment for chest drainage should be available at all hospitals to save the lives of patients presenting with chest injuries.

In conclusion, haemothorax or haemopneumothorax are the most common presentations of penetrating chest trauma. Adequate pleural drainage using simple thoracostomy tubes achieves very good results. This may be the only treatment that may be required. Where there are associated injuries, early,

recognition and appropriate treatment significantly reduce the morbidity and mortality of chest injuries.

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