Studying of Blunt Chest Trauma in Sudan and Potential Diagnosis

Nuha H. Mohamed¹, Mohammed A. Ali Omer¹², Ghada A. Edam¹

¹College of Medical Radiologic Science -Sudan University of Science & Technology- Khartoum –Sudan.
²College of Applied Medical Science-Department of Radiologic Technology- Qassim University – Buraidah – KSA

Abstract: A retrospective study on chest trauma in Sudan and potential diagnosis has been carried out in a sample consists of 280 cases collected from Niyala teaching hospital, Kosti teaching hospital, Khartoum teaching hospital and Omdurman military hospital. The data analysis showed that: that the chest trauma predominated among male with a percent of 66.4% relative to the female group that represents 33.6%, and the incidence is higher among male relative to female during the whole range of ages and the average age of patient was (31.9±14.8) and (32.9±14.6) year. The blunt chest trauma is more common than penetrating one and representing about 73.6% while the penetrating represents only 26.4% of the cases and the incidence of chest trauma found even during childhood i.e. age group of 4-8 years, and increases rapidly following aging and peaking at age group of 24-28 years old. The common causes of chest trauma were the road traffic accidents (RTA) represents 56.5%, Gunshot represents 19.4%, stab wound 13.0% and the least was the fall-down which represents 11.1% and the common involved side in chest was the right lung 55.5%, then the left lung 20.9%, middle 13.6% and both lung 11%. The patient presentation was 53.6% as Heamoptysis, Dysphonea, Chest Pain, and Rib fracture. A 21.8% as Chest pain and Rib fracture. A 12.7% as Chest pain and dysphnea, and 11.8% of patients presented with chest pain only. The findings only being revealed by CT scan were liver-hematoma, sternum fracture, emphysema and pneumothorax.

Keywords: Chest, Blunt, Trauma, CT, x-ray.

1. Introduction

Recently chest trauma has been dramatically increases in Sudan following the high number of natives who possess private cars for transportation, motor cycles and in addition to other factors such as violence attitudes in driving and internal wars in some sectors of Sudan. Chest trauma which has been commonly encountered in Sudanese hospitals and clinics is classified as blunt or penetrating. The penetrating trauma is characterized with an opening to the inner thorax caused by stabbing, fractured ribs or gunshot wounds [1].

Blunt thoracic injuries represent the 3rd. injury among polytraumatic patients i.e. after the head and extremities injuries [2] and as a second common cause of death, following head trauma, and mostly for young age group between 15 and 44 years old [3].

With special consideration, blunt chest trauma is directly responsible for 25% of all traumatic deaths [4]. Most blunt thoracic injuries are caused by motor vehicle crashes (MVC; 63–78%), with the remainder (10–17%) caused by falls from heights and a minority from blows from blunt objects or explosive devices [5].

Portable chest radiography is the initial imaging method used at the emergency workup of the polytrauma patient, and it is useful for detecting serious life-threatening conditions, such as a tension pneumothorax or haemothorax, mediastinal haematoma, flail chest or malpositioned tubes. However, the superiority of CT over chest radiography has been documented in the literature;

CT detects significant disease in patients with normal initial radiographs and in 20% will reveal more extensive injuries compared with the abnormal initial radiographs, necessitating a change of management [6]. CT is far more effective than chest radiography in detecting pulmonary contusion, thoracic aortic injury and osseous trauma, especially at the cervicothoracic spine. Multi Detector CT (MDCT) has dramatically decreased imaging times and offers multi-planar reformatted images. Therefore, it has been established as the gold standard for the imaging evaluation of chest trauma and trauma in general [7].

The general trend of this study was to study the blunt chest trauma in Sudan with consideration to diagnosis with conventional x-ray and CT and their relative findings.

2. Methodology

The study has been carried out as a retrospective study; and the data has been collected from picture archiving systems of different hospitals including Niyala teaching hospitals, Kosti teaching hospital, Khartoum teaching hospital, and Omdurman military hospital. The sample of the study which consists of 280 cases of chest trauma was targeting the patients who referred to those hospitals for thoracic injuries diagnosis. The reviewed variables were the gender, types of trauma, causes of chest trauma, anatomical site of injury, signs and symptoms, and the common radiographic appearance. The data analyzed using EXCELL software which shown in forms of bars and correlation.

3. Results

The results presenting the data related to chest trauma in Sudan and the potential diagnosis and highlighting the gender, types of trauma, age, causes of trauma, anatomical
site, sign and symptoms and the common radiographic appearance.

**Figure 1:** shows the frequency of blunt chest trauma distributed based on gender.

**Figure 2:** shows the frequency % of the chest trauma distributed based on the types of trauma.

**Figure 3:** shows the frequency% of chest trauma distributed based on the age group for male (31.9±14.8 years) and female (32.9±14.6 year).

**Figure 4:** shows the frequency percent of common causes of chest trauma in Sudan.

**Figure 5:** shows the frequency% of the common anatomical sites of chest trauma.

**Figure 6:** shows the frequency% of the common signs and symptoms of chest trauma (H = Heamoptysis, D = Dysphonea, CP = Chest Pain, F = Fever, RF = Rib fracture)
Figure 4.1 The Frequency of blunt chest trauma distributed based on the types of trauma. It reveals that: the blunt chest trauma is more common than penetrating one and representing about 73.6% while the penetrating represents only 26.4% of the cases. The increasing incidence of blunt cases has a relation with mode of accidents, and in this realm Wong et al, [9] stated that blunt thoracic trauma causes 20% of trauma related deaths which caused by motor vehicle crashes in 63% to 78%, while only 10% to 17% are related to fall from height. Also Sarita et al, [10] stated that the common type of chest trauma was the blunt (64%) of the cases and was due to motor vehicle accidents.

Also the result showed in Figure (4.3), that highlighted the frequency% of chest trauma distributed based on the age group for male and female, the incidence of chest trauma found even during childhood i.e. age group of 4-8 years, however the incidence increases rapidly following aging and plateau of incidence occurs at the age group of 24-28 years old, which represent the early youth that famous for violence, adventures and subjection to different causative traumatic factors. Indeed the incidence is higher among male relative to female during the whole range of ages and the average age of patient was (31.9±14.8) and (32.9±14.6 year) years for male and female respectively. This result is agreed with study carried out by EL-Menyar et al, [11] in which they found that the chest trauma is common among age groups of 33±15years and males comprised 94% of cases. In Figure (4.4) the study showed that: the frequency% of the common causes of chest trauma were the road traffic accidents (RTA) represents 56.5%, Gunshot represents 19.4%, stab wound 13.0% and the least was the fall-down which represents 11.1%. The high incidence of chest trauma related to traffic accidents is depend on the area of the research, which ascribed to dramatic increase in the number of cars in the country as well as to the narrow constructed roads which ruined by rains and flood, as well the raising tribal and political wars and conflicts in some sectors of Sudan. In relation to this result Omert et al, [12] stated that: motor and vehicles accidents and falls down have high incidence causes and mortality in younger adults in the united state.

Figure (4.5) shows the frequency% of the common anatomical sites of chest trauma. It reveals that: the common involved side in chest trauma was the right lung 55.5%, then the left lung 20.9%, middle 13.6% and both lung 11%. The justification could be ascribed on the fact that: many vehicle drivers manage to save the left side depending on the rules of driving in Sudan i.e. the vehicles are left direct-soon which leading to increase the traffic accident at right site of the common cars and vehicles.

Figure (4.6) shows the frequency% of the common signs and symptoms of chest trauma. Hence the study revealed that: 53.6% of the patients presented with Hemoptysis, Dysphonia, Chest Pain, and Rib fracture. A 21.8% presented with Chest Pain, and Rib fracture. A 12.7% presented with Chest Pain and dysphonia. And 11.8% of patients presented with chest pain. The consequences of blunt trauma such as hemoptysis commonly indicates the piercing of the lungs with the broken ribs in the sample, and however due to interference of some signs and symptoms only a CT scan can reveals the pattern of the trauma, in this realm: the common signs and symptoms shown above have been mentioned by Vyhnánek et al, [13] in which they stated that CT is considered as an imaging modality of choice in the assessment of patients with clinical or symptoms following blunt chest trauma. In this study some findings only being
revealed by CT scan were emphysema and consolidation while pneumothorax has been shown in CT and CXR as highlighted in Figure (4.7)

References


Author Profile

Nula Hassan Mohamed: received a B. Sc. in Diagnostic Radiology from Sudan university of Science and Technology in 2006. She has been working as Radiologic Specialist at Diagnostic Radiology department in Khartoum Medical Centre and at different clinics during 2007-2011. Then she has been working for three years as Radiologic Specialist in Saudi Arabia up to date.

Mohammed Ahmed A. Omer: Award the B. Sc.-1. in Radiotherapy and Nuclear Medicine, B. Sc.-2 in Medical Equipments Technology and M.Sc. degrees in Medical Physics from Sudan University of Science and Technology in 1995, 1998 and 2001, respectively. He has been working as medical and radiation technologist at Radiation and Isotopes Center of Khartoum as well as a lecturer at College of Medical Radiologic Science, Sudan University of Science and Technology (1996 – 2013). And he received a Ph. D. degree from University Putra Malaysia - 2007 in Medical physics-Applied Radiation as well; now working as a lecturer (Associate Prof.) at Qassim University-Buraidah-KSA.

Ghada A. E. Sakin: Awarded B. Sc. Degree in Nuclear Medicine in 2010 from National Ribat University-Sudan and M. Sc. from College of Medical Radiologic Science-Sudan University of Science and Technology. She has been working as a lecturer (part timer) at Sudan University of Science and Technology department of Radiotherapy and Nuclear Medicine as well as NM technologist at RICK. Now as a Ph. D. candidate in same field.