



# Management over Penetrating Wound of the Chest in University Hospital of Conakry

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**Abstract:** Penetrating injuries to the chest present a frequent and challenging problem. The majority of these injuries can be managed non-operatively. The aim of this study were to determine the frequency of penetrating wounds of the chest, identifying wounding agents and circumstances of the trauma occurred, describe the diagnostic and therapeutic care at the University Hospital of Conakry. Methods As part of this study was the thoracic surgery department of the National Hospital Donka Hospital in Conakry. This was a retrospective descriptive study of a type of 4 years and 8 months, from 1 January 2010 to 30 August 2015 inclusive. It involved a chart review of patients admitted consecutively in the service for penetrating trauma of Thorax. The variables studied were epidemiological, diagnostic, and therapeutic. Results: We collected 98 cases of penetrating wounds of the chest during the study period, representing 21.16% of all thoracic pathologies treated in the service during the same period (n = 463). The male occupied 87% of cases (n = 85) and the female gender was 13% (13). The average age of patients of patients was 25 years with extremes of 04 and 60 years. The age between 21 and 30 years is the most represented with 59.19% (n = 58). Pupils and students were most concerned with 31.63% (n = 31), followed by workers (23.46%, n = 23), street vendors (20.40%, n = 20) and drivers (15.30%, n = 30). The wounding agents were represented by stabbing with 67% (n = 66), firearms with 26% (n = 25), and impalement on perforating agents in 7% (n = 7%). The circumstances of occurrence recorded were armed criminal assault in 87.75% (n = 86), hunting accidents with 5.10% (n = 5), brawls with 4.08% (n = 4) and falls from height with 3.06% (n = 3). Conclusion Penetrating wounds of the chest are a current pathology by increased violence, insecurity and the misuse of firearms in major cities. The vital importance of intra thoracic organs is a medical and surgical emergency.

**Keywords:** Penetrating, Wounds, Chest, Management

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## 1. Introduction

The penetrating chest wound is a solution of continuity of one of the chest covering. It is penetrating said if it exceeds the parietal pleura of one or the other of the two pleural

cavities or it reaches one of the mediastinal tissue. [1] Penetrating injuries to the chest present a frequent and challenging problem. The majority of these injuries can be managed non-operatively. The selection of patients for operation or observation can be made by clinical examination and appropriate investigations. The trauma ultrasound has

become a valuable first-line tool to rule out pericardial tamponade [2] Penetrating trauma may affect structures not apparent by outward wounds given the path the missile may take. Regardless of the injury, there are usually changes in the patient's ability to oxygenate and ventilate adequately. he information gathered from the prehospital setting is important. In general some important points to consider: [3] Penetrating trauma may affect structures not apparent by outward wounds given the path the missile may take. Regardless of the injury, there are usually changes in the patient's ability to oxygenate and ventilate adequately. he information gathered from the prehospital setting is important. In general some important points to consider: [4] Motor vehicle collisions: speed, whether or not the patient was wearing a safety restraint, was their airbag deployment, their position in the car, area of impact and surrounding damage. • Motorcycle or bicyclist: if struck by vehicle and speed, if thrown and distance. • Pedestrians struck: the type vehicle and speed and if thrown and the distance. • Penetrating trauma: the type of firearm, caliber, distance; for stab wounds, the blade length and reported force. • Keep in mind that in penetrating trauma, gunshot wounds have a less predictable pattern of injury as the missile may not follow a straight course. The effects of the "blast" may also cause injury.[5]. The physical examination should be an organized approach to include the primary survey with attention to any life threatening injuries followed by a secondary survey as taught in ATLS/ATCN courses.

40% Penetrating Injury Involves the Thorax, • 15-28% of Penetrating Thoracic Injuries Require Thoracotomy [6]

Many cases of traumatic deaths due to chest injury may be prevented by prompt diagnosis and a standardized therapeutic approach in the trauma resuscitation room. A high index of suspicion for lethal injury patterns, based on the mechanism of trauma and the clinical presentation, is a crucial to prompt diagnosis and intervention. [7]

Penetrating wounds of the chest represent 10% of chest injuries in Europe [8], with an incidence ranging from steadily increasing 5 to 13% [9]. In Africa the incidence of penetrating wounds of the chest was between 20 and 44% [10]. Penetrating trauma may affect structures not apparent by outward wounds given the path the missile may take. Regardless of the injury, there are usually changes in the patient's ability to oxygenate and ventilate adequately. he information gathered from the prehospital setting is important. In general some important points to consider:.

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The aim this study was to evaluate the treatment of penetrating wounds of the chest at the University Hospital of Conakry.

## 2. Methodology

### 2.1. Patients and Method

It is a descriptive retrospective study conducted in the thoracic surgery department of university hospital of Donka in Guinea Conakry from January 2010 to august 2015 inclusively. 107 patients were hospitalized and treated for penetrating wound of the chest.

### 2.2. Variable and Epidemiology Analysis

Our study involved a chart review of patients admitted consecutively in the thoracic department for a penetrating wound of the thorax. The variables studied were epidemiological, diagnostic, treatment and results on socio-demographic aspects of the victims, wounding agents and circumstances of occurrence of the accident, the clinical and radiological assessment of the lesions, the therapeutic conduct and its aftermath.

### 2.3. Initial Evaluation

The extent and means of the initial evaluation in the emergency room (ER) depends on the clinical condition of the victim. The patients could be divided in three groups. First, patients with cardiac arrest or imminent cardiac arrest require an immediate ER re suscitative thoracotomy without any investigations.

## 3. Results

**Table 1.** Fréquency of Penetrating wounds comparing to the others pathology in the thoracic department.

Pathology	Number of cases( n=463)	Percentage (%)
Hémothorax/	115	24,83
Hémopneumothorax	109	23,54
Penetrating wounds of chest	98	21,16
Tuberculosis Pleuresia	65	14,03
Penetrating wounds of the thorax	32	6,91
Pyothorax	22	4,75
Pyopneumothorax	10	2,15
Spontaneous Pneumothorax	07	1,51
Péricarditis	03	0,64
Abcess of the lung	2	0,43
Total	463	100

**Table 2.** Distribution of the patient according to the socio-professionnal category.

socioprofessionnal category	Number of cases( n=98)	Percentage (%)
Students	31	31.63
Workmen	23	23.46
Merchants	20	20.40
Driver	15	15.30
Housewives	6	6.12
Civils servant	3	3.06
Total	98	100

**Table 3.** Distribution of patient according to the Circumstances occurred.

Circumstances occurred	Number of cases( n=98)	Percentage (%)
Criminal assault	86	87,75
Accident of hunting	5	5,10
Brawls	4	4,08
Fall a height	3	3,06
Total	98	100

**Table 4.** Fréquency of clinical signs.

Motif de consultation	Nombre de cas N=98	%
Thoracic pain	98	100
Dyspnea	74	75,51
Emphysema	25	25,51
Hémoptysy	02	2,04
Cough	05	5,10

Penetrating wounds of the chest accounted for 21.16% (n = 98) of the entire thoracic pathologies treated in our department during the period of the study (n = 463) Table 1. We noted a male predominance (86.73%, n = 85): The mean age of patients was  $25 \pm 5$  years, ranging from 04 years to 60 years. The age group between 21 et 30 years is the most represented with 59.19% (n = 58). The most relevant socio-professional categories were pupils / students (31.63%, n = 31 cases), workers (23.46%, n = 23), street vendors (20.40%, n = 20), followed by drivers (15.30%, n = 15), housewives (6.12%, n = 6cas) and staff (3.06%, N = 3). Table 2

The most wounding agent in question was stabbed (67%, n = 66), followed by firearms (26%, n = 25) and falls on perforating agents (7.14%, n = 7).

The circumstances of occurrence were armed criminal assault in 87.75% (n = 86), hunting accidents with 5.10% (n = 5), brawls with 4.08% (n = 4) and falls from height with 3.06% (n = 3). Table 3. Clinical signs were dominated by chest pain recorded in 100% of cases (n = 98). Table 4. The standard chest X-ray was the only accessible and radiological examination was performed routinely in all patients. The lesions observed were dominated by pleural effusions: gaseous effusions (13.26, n = 13), Effusions (10.20%, n = 10), joint effusion (57.14%, n = 56), joint effusion + inclusion of foreign bodies (15.30%, n = 15), joint effusion + rib fracture). the therapeutic management was essentially based on the medical treatment and pleural drainage. All patients (100% N = 98) underwent a vascular filling made isotonic solutes and macromolecules; Thirteen point two and six percent (13.26%, n = 13) had received a blood transfusion iso group rhesus iso. The thoracic drainage was performed in 94.89% (n = 93). A drug was prescribed adjuvant therapy: analgesics (paracetamol 1g infusion every 6 hours), anti-inflammatory drugs (Diclofenac 50mg) in 100% of cases (98 =), an antibiotic made of amoxicillin + clavulanate (83.67%, n = 82), gentamicin (16.32%, n = 16). Tetanus serum was administered at 74.48% (n = 73). About 5.10% who received thoracotomy (n = 5), one (n = 1) consisted of a hemostasis in vascular injury intercostal and four (n = 4) in a lung pleural decortication.. The therapeutic outcome was favorable in 88.77% of cases (n = 87). The suites have been unfavorable in 5.10% of cases (n = 5): it was a type of morbidity

empyema and pleural effusion recurrence in 4.08% of cases n = 4) and a registered lethality in 2.04% of cases (n = 2). The average length of hospital stay was 08jours with extremes of 09 and 49 days.

## 4. Discussion

Penetrating wounds of the chest represented 21.16% of all patients admitted to the thoracic chirurgy of the CHU from Conakry between 2010 and 2015. This rate varied in the literature between 20% [11] to 23% [12]. The average age of patients was 25 years with extremes of 4 years and 60 years. Corroborating studies Yaqini K Casablanca [13]), Shua O N'Djamena [10] and Randrianmanajara in Madagascar [11]), which have respectively reported mean age of 26 years, 27.2 years, and 27 years. This high frequency among young adults could be explained both by the hyperactivity of this layer and its mobility at any time which exposes it to risks associated with urban insecurity.

In our study, male gender (86, 73%, n = 85) was more concerned than the female gender (13.26%, n = 13) with a sex ratio of 6.43. This frequency varied in the literature of 83.17% to 95% in the S Yena studies Yaqini Guivach K. and E. [9, 13, 14]. This predominance of the male gender can be explained by the place of the male gender in society that the predestined to perform risky trades. Pupils and students were the first victims with a frequency of 31.63% (n = 31 cases). This observation was made by Shua O in N'Djamena and Yena S in Bamako with 39.5% and 36.4% respectively [13, 14]. It could be explained by the fact that pupils and students sometimes have a job which requires time schedules and routes at risk. It is the same peddlers whose itinerant business, expose the aggressions robbers, sometimes disguised as customers. Penetrating stab wounds were frequent etiology in our study with 67.34% (n = 66). This result was similar to that reported by Randrianmannajara to Madagascar with 53% [11]. The criminal aggression was the circumstance occurred most observed in our study and in that of Yaqini K Cassablanca [13]. In both studies the chest pain was the first clinical sign with 100% respectively (n = 98), 94.6% (n = 175). Pleural effusions with or without broken ribs were the radiological lesions in our study. The same was done in the study of Yen S in Mali. [8] Medical treatment and thoracic drainage were enough for the management of penetrating wounds of the chest in almost all cases. Indications for thoracotomy were rare, dictated by the failure of thoracic drainage bringing more than 1500 ml of blood initially or 300 ml / hour and / or hemodynamic instability despite the well pipe filling [11,13] was. L'évolution favorable in 88.77% of cases in our series (n = 87). Morbidity was observed in type pyothorax (5.10%, n = 5) and pleural effusion recurrence (4.08%, n = 4), the K Yaqini image that had reported 7% pyothorax and 43% of pleural effusions recurrence. Lethality of 2.04% (n = 2) was also observed in our study. It was the same in those of Yena S [14] and Mandal [8] which showed 9.3% lethality rates respectively (n = 8) and 2.8%. Patients had an average stay of 08jours in 79.59% cases with extremes of 01day due to death on the day

of admission and 49 days for empyema occurred in the aftermath of a chest drain. This result was superimposed on that of Camara IA [9] who observed an average residence of 18 days in 83% of cases with extremes of 01 days and 49 days.

## 5. Conclusion

Penetrating wounds of the chest are a current pathology by increased violence, insecurity and the misuse of firearms in major cities.

The vital importance of intra thoracic organs is a medical and surgical emergency.

The hope of reducing these injuries is prevention through education of the population, the implementation of civil protection and criminal deterrence measures.

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