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Treatment of Penetrating Abdominal Wounds at the National Hospital Ignace Deen, CHU Conakry

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Abstract

Introduction: Due to their frequency and severity, penetrating abdominal wounds are a public health issue. The causes and mechanisms of these wounds vary. The aim was to contribute to the study of the management of these wounds in the department. **Patients and Methods:** A one-year prospective, descriptive, and analytical study was conducted from April 1, 2023, to March 31, 2024, in the General Surgery Department of the Ignace Deen National Hospital, Conakry University Hospital. **Results:** Out of a total of 120 traumatic abdominal surgical emergencies, we collected 24 cases of penetrating wounds of the abdomen (20%). Males were predominant. The average age of the patients was 20.40 years. Schoolchildren and students were the most affected. Social conflicts were the main etiological factor (58%). The clinical picture was dominated by abdominal pain (100%) and external bleeding through a parietal wound (29.2%). All patients were treated surgically, with the small intestine being the most affected (62.5%). Excision and suturing of the visceral wound was the main surgical procedure performed. The postoperative outcome was favorable in 75% of cases. Significant prognostic factors were: use of a firearm, delay in consultation (>24 hours), and hemodynamic instability of patients on admission. **Conclusion:** Penetrating wounds of the abdomen are frequent and serious surgical emergencies, requiring both accurate diagnosis of the injury and prompt and effective treatment.

Keywords

Penetrating Wounds, Abdomen, General Surgery

1. Introduction

Penetrating wounds of the abdomen are breaks in the abdominal wall with traumatic rupture of the peritoneal cavity [1]. The etiologies and mechanisms of these wounds are diverse: in civilian practice, they can result from riots, assaults, fights, attempted suicide, road accidents, impalement, or war wounds during periods of instability [2]. They can lead to either peritonitis (in the case of injury to a hollow organ), hemoperitoneum (in the case of injury to a solid organ or blood vessel), or a combination of the two. Such diversity makes the management of these wounds difficult, despite advances in resuscitation, the refinement of diagnostic procedures, and medical imaging studies [3] [4]. Morphological examinations such as thoracoabdominal pelvic computed tomography (TAP CT) and abdominal ultrasound can be of vital importance in the diagnostic process [5].

The treatment of penetrating wounds is currently a subject of controversy between the dogma of systematic laparotomy, the new therapeutic approach called "watchful waiting", and laparoscopy [6]. The management of penetrating abdominal wounds often depends on the causative agent and the patient's hemodynamic status. After a complete assessment, the majority of patients undergo exploratory laparotomy, which over the years has been replaced by diagnostic and therapeutic laparoscopy [6]. The prognosis for these wounds depends on the delay in treatment, the causative agent, vascular damage, the number of organs injured, and the technical capabilities of the hospital facility [7]. The frequency is increasing worldwide and varies from country to country. This is linked to an increase in crime, the availability of weapons, and the presence of social conflicts [8].

In the United States, gunshot wounds are the leading cause of death in cases of abdominal trauma and pose a real public health problem, with an estimated prevalence of 63,077 cases per year [9].

At Sacré-Coeur Hospital in Montreal, according to [6], out of 60 cases of penetrating trauma, 19% were abdominal and 31% were thoracic.

In France, penetrating wounds to the abdomen are not very common (20% of abdominal trauma), but stab wounds account for two-thirds of cases [8].

In South Africa, particularly in Johannesburg, there are 4000 gunshot wounds each year [10].

In Guinea, Fofana *et al.* reported in 2019 at the Ignace Deen National Hospital that traumatic wounds accounted for 16.65% of all abdominal trauma [11].

Penetrating abdominal wounds have a mortality rate of 10%, and the presence of hemorrhagic shock increases the mortality rate to over 40% [12].

The objective was to contribute to the study of the management of penetrating abdominal wounds in the General Surgery Department of the Ignace Deen National Hospital.

2. Patients and Methods

This was a prospective, descriptive, and analytical study lasting one year, from April 1, 2023, to March 31, 2024.

The study focused on patients with penetrating abdominal wounds (including the thoraco-abdominal area). The study included patients whose diagnosis of a penetrating abdominal wound was confirmed and who were treated in the department during the study period. Excluded from the study were patients whose diagnosis of a penetrating abdominal wound was confirmed but who died upon admission before receiving care. Hospital records, operative reports, and individual patient medical files were used.

A survey form was used to collect information related to our study variables. The assessment of the severity of patients with penetrating abdominal wounds allowed them to be classified into two categories based on hemodynamic status: Stable patients who underwent a full assessment before surgery and unstable patients who had an emergency laparotomy before completing the assessment (abdominal ultrasound, etc.).

The chi-squared test was used for comparisons, and the test was considered significant if the p-value was less than or equal to 0.05.

3. Results

Out of a total of 120 traumatic abdominal surgical emergencies, we collected 24 cases of penetrating abdominal wounds (20%). The average age of the patients was 20.40 years. Males predominated, with a male/female ratio of 11. Schoolchildren and students were the most affected (50). Social conflicts were the main etiological factor (58%) (Table 1).

Table 1. Distribution of patients according to the injuring agent.

Vulnerating agent	Number	Percentage
Firearm	**16**	**66.6**
Bladed weapon	4	16.7
Road accident	2	8.35
Occupational accident	1	4.17
Encornement	1	4.17
Total	**24**	**100**

Text 1: According to the patients' hemodynamic status at admission, 79.2% (n = 19) were stable while 20.8% (n = 5) were unstable.

Text 2: Based on the consultation time, 75% of patients were seen within the first six hours, 20% were seen between seven and twenty-four hours, and 4.2% were seen after twenty-four hours (Table 2 & Table 3).

Text 3: All patients underwent surgical treatment. Excision plus suturing of the visceral wound and trimming of the parietal wound were the most commonly performed surgical procedures (Table 4).

Text 4: The postoperative outcome was favorable in 75% of cases. However, we noted a morbidity rate of 20.83% (parietal suppuration (3), internal hemorrhage

(1), digestive fistula (1)) and a mortality rate of 4.16% (1) (Figure 1, Table 5).

Table 2. Frequency of clinical signs upon admission.

Functional signs	Numbers (n = 24)	Percentage
Abdominal pain	24	100
External bleeding	7	29.2
Vomiting	6	25.0
Dyspnea	2	8.3
Dizziness	2	8.3
Hématurie	1	04.2
Abdominal wound	23	95.8
Thoracoabdominal wound	1	4.2

Table 3. Frequency of paraclinical examinations performed.

Imaging/Biology	Number	Percentage
Pre-op biological assessment	24	100
Abdominal ultrasound	14	58.33
Chest X-ray	2	8.33

Table 4. Injury assessment.

Macroscopic lesions	Number	Percentage
Small bowel	15	62.5
Colon	10	41.7
Stomach	8	33.3
Spleen	2	8.3
Liver	2	8.3
Diaphragm	2	8.3
Bladder	1	4.2
Retroperitoneal hematoma	1	4.2

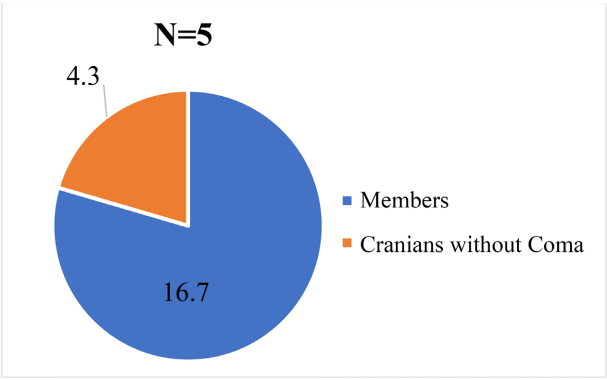

Figure 1. Frequency of associated lesions.

Table 5. Breakdown of patients by length of hospital stay.

Length of hospital stay (days)	Number	Percentage
<8	16	66.7
8 - 15	7	29.1
>15	1	4.2
Total	24	100

Average length of hospital stay: 8.2 days; Extremes: 4 days and 24 days.

4. Discussion

Penetrating wounds to the abdomen are a real public health problem [13]. The frequency of these wounds appears to be high in our department. In their study, Issa Mapouka *et al.* [5] in Central Africa reported a frequency of 20%. Our result could be related to the resurgence of political demonstrations and civil-military violence in our country.

The average age observed in our study is higher than that reported by Fofana *et al.* [11] in Guinea, who found an average age of 12.5 years. Young people are more involved in demonstrations and civil violence and are therefore more exposed to abdominal trauma.

We noted a clear male predominance, as reported in some African series between 82.4% and 96.5% [14] [15]. This could be explained by the fact that men are more involved in this violence than women.

The circumstances of occurrence were dominated by social conflicts. The same observation was reported by certain African authors, Issa Mapouka *et al.* in Central Africa and Choua *et al.* [5] [13] in Chad, who reported between 48.2% and 60.4%, respectively. In contrast, Diakité *et al.* [16] in France reported that assaults and suicides were the most frequent circumstances in which it occurred.

Gunshot wounds cause multiple visceral injuries, with an average of four organ wounds [14]. In the literature, the frequency of stab wounds varies from 50% to 88.5% [14] [17].

Assessing the severity of patients at admission allowed them to be classified into 2 categories based on hemodynamic status: stable and unstable [16]. Those who were unstable underwent emergency laparotomy, while those who were stable had surgery after completing the workup (abdominal ultrasound, etc.).

The initial clinical assessment must include a search for signs of hemorrhagic shock and peritoneal irritation.

This initial clinical examination determines the subsequent management, guides the choice of additional tests, and dictates the therapeutic approach.

In most cases, the consultation time was within the first 6 hours. In Central Africa, Issa Mapouka *et al.* [5] reported that 71.4% of patients consulted within the first 6 hours. In France, Diakité *et al.* [16] reported that all patients were consulted before the 6th hour. This time frame depends mainly on the patient transport

system. In our context, patients generally arrive at the emergency department by public transport without initial care, which would explain the delay in consultation in our study.

The clinic was dominated by abdominal pain (100%) and external bleeding through the wound (29.2%).

Biological analyses were performed systematically in all patients. They included a complete blood count, hemostasis assessment, renal assessment, hepatic assessment, and blood typing. We did not note any major abnormalities apart from cases of anemia requiring blood transfusions in some cases.

Imaging tests are used to determine the extent of the injury and whether or not surgery is indicated. Abdominal ultrasound is very useful in Africa, where access to CT scans is very limited, especially in emergency situations [18] [19].

However, computed tomography (CT) is the gold standard imaging test in stable patients, with a sensitivity of 80% and a negative predictive value of 93% for the diagnosis of many solid organ injuries [20]-[22].

Therapeutically, in our context, the rule was to systematically operate on all penetrating abdominal wounds. This helped eliminate any hesitation about whether or not there was a visceral injury and, above all, avoided the risk of missing it. This approach is currently being questioned, especially for stab wounds, as it leads to a significant number of negative laparotomies, ranging from 10% to 53% [18].

The therapeutic approach used in our study could be justified by the high frequency of gunshot wounds, the lack of precise diagnostic tools for certain intra-abdominal injuries, and the severity of some patients' clinical conditions upon arrival.

All patients who underwent surgery had a median laparotomy. Elsewhere, laparoscopic surgery is another alternative for the management of gunshot wounds [16] [23]. However, it is not yet part of our therapeutic arsenal.

Combined injuries are less common in stab wounds than in gunshot wounds.

The small intestine was the most frequently affected organ in our study. The same observation was made in most of the literature, where small intestine wounds ranged from 23% to 74% and colon wounds from 6.3% to 33.7% [17].

The surgical procedures performed intraoperatively were mainly gastric and intestinal sutures and small bowel resections and anastomoses (**Figures 2-5**).

Operated liver wounds were treated by tamponade and peritoneal drainage. Diaphragmatic wounds were associated with gastric wounds, which were treated by sutures and systematic drainage of the pleural cavity. This approach differs from that found in the study conducted by Diakité *et al.* in France, where these wounds were treated with laparoscopic sutures [16].

In our study, the postoperative outcomes were mostly uncomplicated. However, we noted cases of morbidity (parietal suppuration, stercoral fistula, internal hemorrhage) and mortality.

The average length of hospital stay noted in our study was identical to that

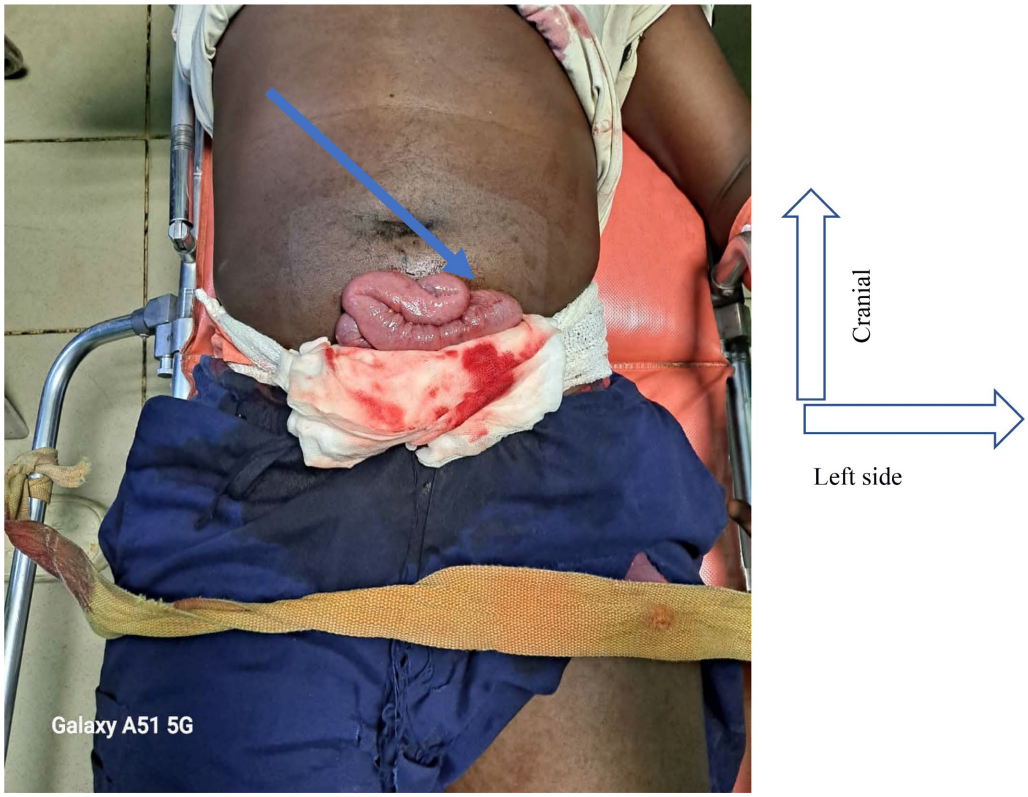

Figure 2. Patient seen in the emergency room for an abdominal wound with protruding small bowel loops following a motorcycle accident.

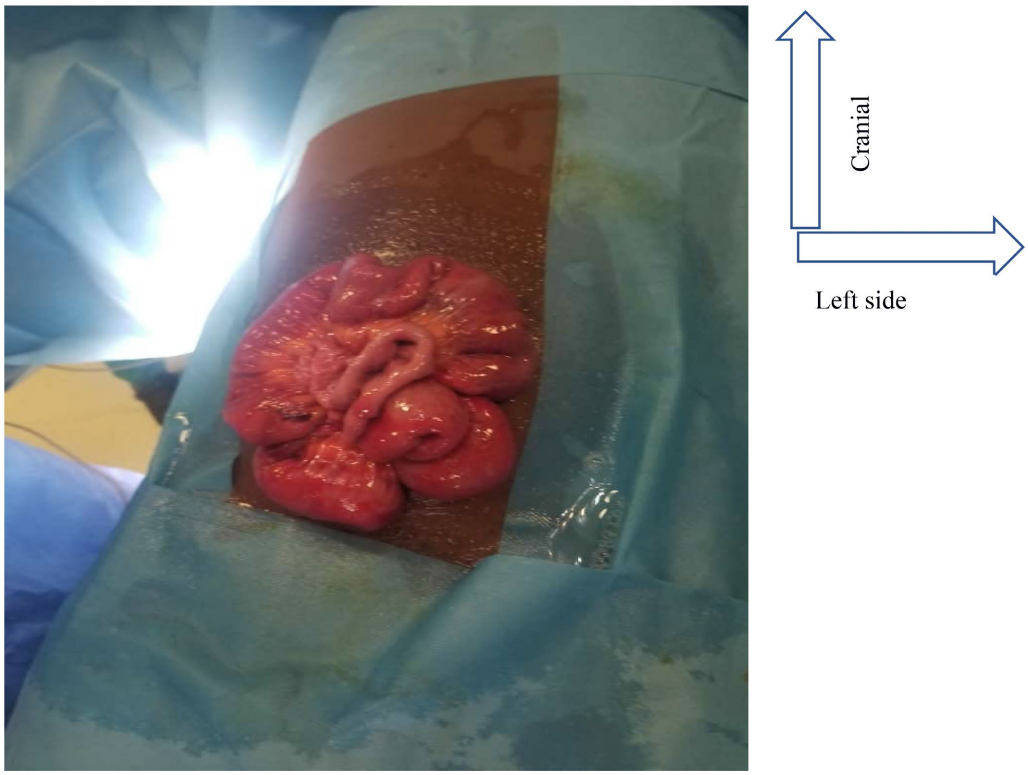

Figure 3. Patient on operating table before the scalpel is used.

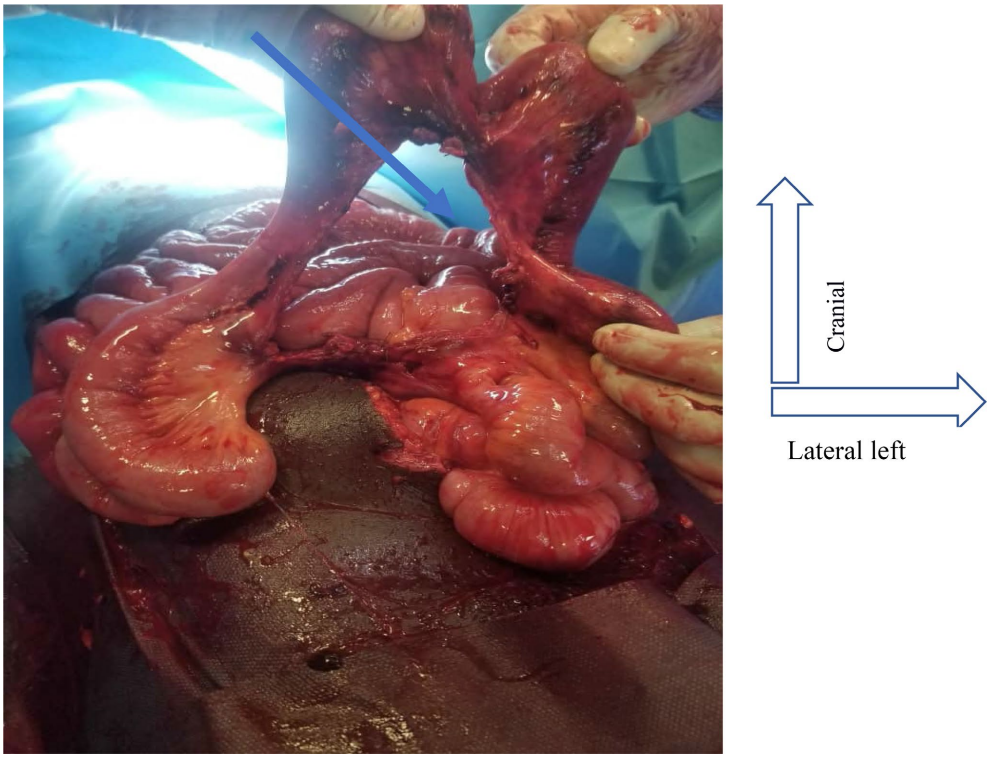

Figure 4. Exploration (mesenteric rupture with ilreal necrosis).

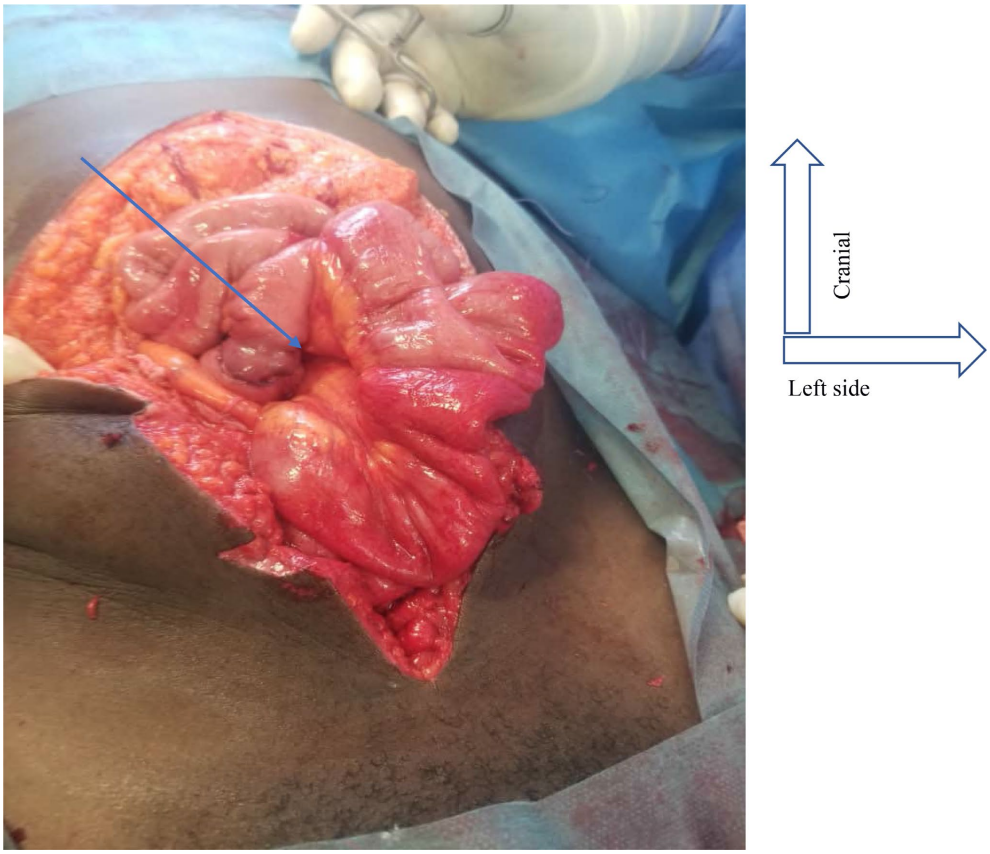

Figure 5. Ileo-ileal anastomosis after ileal resection involving necrosis.

observed in a study conducted by Diakité *et al.* in France [16].

Significant prognostic factors were: use of a firearm, delayed consultation (>24 hours), and hemodynamic instability of patients on admission (Table 6).

Table 6. Multivariate analysis using logistic regression of prognostic factors.

Caracteristics	Ora	95% CI	p-value
Professions (students)	0.54	0.57 - 1.04	0.13
Vulnerable agent (firearm)	3.45	1.26 - 5.77	0.004
Age	0.69	0.13 - 3.58	0.60
Unstable hemodynamic state	4.55	0.13 - 6.23	0.003
Means of transport	1.44	0.06 - 2.65	0.010
Consultation time > 24 h	2.45	0.02 - 5.06	0.003

5. Conclusion

Penetrating abdominal wounds are frequent and serious surgical emergencies, requiring both accurate diagnosis of the injury and prompt and effective treatment. Improving the organization of the emergency care chain and creating an emergency medical service (EMS) could improve the prognosis for patients.

Study Limitations

Being single-center, small sample size, exclusion of patients who died before care, and follow-up limited to the immediate postoperative period.

The study variables were both quantitative and qualitative, divided into epidemiological, clinical, paraclinical, and therapeutic data.

Ethical Consideration

Our data were collected anonymously, and confidentiality was maintained in accordance with medical ethics. The information obtained was used purely for scientific purposes.

This study was conducted after authorization from the administrative authorities of the National Hospital Ignace Deen, CHU Conakry, formal committee review was not required.

Availability of Data and Materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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Author Contributions

Diallo Alpha Amadou, Barry Mamadou Sakoba, and Soumaoro Labilé Togba con-

tributed to the conception of the article's idea and conducted the surveys.

Camara Fodé Lansana and Touré Aboubacar supervised and reviewed the manuscript and contributed to the documentary search.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Loutfi, A. (2004) Surgical Care at the District Hospital. World Health Organization. *African Health Sciences*, **4**, 75. https://pmc.ncbi.nlm.nih.gov/articles/PMC2141664/?utm

[2] Nabeel Zafar, S., Rushing, A., Haut, E.R., Kisat, M.T., Villegas, C.V., Chi, A., *et al.* (2011) Outcome of Selective Non-Operative Management of Penetrating Abdominal Injuries from the North American National Trauma Database. *British Journal of Surgery*, **99**, 155-164. https://doi.org/10.1002/bjs.7735

[3] Thoracotomie.com (2014) Penetrating Abdominal Trauma. Small Emergency Encyclopedia.

[4] Offner, P.J., *et al.* (2022) Penetrating Abdominal Trauma. https://emedicine.medscape.com/article/2036859

[5] Issa Mapouka, P.A., Ngatchoukpo, V.N., Ngboko Mirotiga, P.A., Nabia, D.R., Roméo Fioboy, V.A. and Tékpa, B.J.D.D. (2019) Les Plaies Pénétrantes de L'abdomen par Armes à Feu: Aspects Épidémiologiques, Cliniques, Lésionnels et Thérapeutiques au CHU Communautaire de Bangui, Centrafrique. *European Scientific Journal ESJ*, **15**, 475-488. https://doi.org/10.19044/esj.2019.v15n36p475

[6] Velmahos, G.C., Demetriades, D., Toutouzas, K.G., Sarkisyan, G., Chan, L.S., Ishak, R., *et al.* (2001) Selective Nonoperative Management in 1,856 Patients with Abdominal Gunshot Wounds: Should Routine Laparotomy Still Be the Standard of Care? *Annals of Surgery*, **234**, 395-403. https://doi.org/10.1097/00000658-200109000-00013

[7] Bombah, F., Biwolé, D., Ekani, B., Ngo Nonga, B. and Essomba, A. (2020) Prise en charge chirurgicale des plaies pénétrantes abdominales à l'Hôpital Laquintinie de Douala: Indications, techniques et résultats. *Health Sciences and Disease*, **21**, 55-61. https://www.hsd-fmsb.org/index.php/hsd/article/download/1918/pdf_919/5208?utm_source=chatgpt.com

[8] Hoffmann, C., Goudard, Y., Falzone, E., Leclerc, T., Planchet, M., Cazes, N., *et al.* (2013) Prise en charge des traumatismes pénétrants de l'abdomen: Des spécificités à connaître [Management of Penetrating Abdominal Trauma: What We Need to Know?]. *Annales Françaises d'Anesthésie et de Réanimation*, **32**, 104-111. https://doi.org/10.1016/j.annfar.2012.12.006

[9] Monneuse, O.J., Barth, X., Gruner, L., Pilleul, F., Valette, P.J., Oulie, O., *et al.* (2004) Les plaies pénétrantes de l'abdomen, conduite diagnostique et thérapeutique. À propos de 79 patients. *Annales de Chirurgie*, **129**, 156-163. https://doi.org/10.1016/j.anchir.2004.01.013

[10] MacFarlane, C. (2002) Aide Memoire for the Management of Gunshot Wounds. *Annals of the Royal College of Surgeons*, **84**, 230-233. https://doi.org/10.1308/003588402320439649

[11] Fofana, N., Soumaoro, L.T., Mamy, G.F., Fofana, H., Soumah, M.S., Kondano, S.Y., Soumah, M.L., Touré, A. and Diallo, A.T. (2019) Plaies traumatiques de l'abdomen: Fréquence et prise en charge au service de chirurgie générale de l'Hôpital National

Ignace Deen de Conakry. *Journal Africain de Chirurgie Digestive*, **19**, 2653-2657. https://jacd.online/2025/08/20/plaies-traumatiques-de-labdomen-frequence-et-prise-en-charge-au-service-de-chirurgiegenerale-de-lhopital-national-ignace-deen-de-conakry/?utm_source=chatgpt.com

[12] Hamada, S. and Paugam-Burtz, C. (2013) Traumatismes Abdominaux. *EMC—Médecine d'urgence*, **8**, 1-14 https://wd.fmpm.uca.ma/biblio/theses/annee-htm/FT/2019/these114-19.pdf?utm_source=chatgpt.com

[13] Choua, O., Rimtebaye, K., Adam Adami, M., Bekoutou, G. and Anour, M.A. (2016) Les Plaies Penetrantes Par Armes Blanches Et A Feu A N'djamena, Tchad: Une Epidemie Silencieuse? *European Scientific Journal, ESJ*, **12**, 180-191. https://doi.org/10.19044/esj.2016.v12n9p180

[14] Mnguni, M.N., Muckart, D.J.J. and Madiba, T.E. (2012) Abdominal Trauma in Durban, South Africa: Factors Influencing Outcome. *International Surgery*, **97**, 161-168. https://doi.org/10.9738/cc84.1

[15] Samuel, J.C., Akinkuotu, A., Villaveces, A., Charles, A.G., Lee, C.N., Hoffman, I.F., *et al.* (2009) Epidemiology of Injuries at a Tertiary Care Center in Malawi. *World Journal of Surgery*, **33**, 1836-1841. https://doi.org/10.1007/s00268-009-0113-4

[16] Diakité, S.Y., Baldé, H., Baldé, A.K., Diallo, A.D., Camara, F.L., Camara, A.K., *et al.* (2020) Prise en charge des plaies pénétrantes de l'abdomen au CHU de Pointe-à-Pitre. *Journal Africain de Chirurgie Digestive*, **20**, 2950-2955. https://jacd.online/2025/03/18/prise-en-charge-des-plaies-penetrantes-de-labdomen-au-chu-de-pointe-a-pitre/?utm_source=chatgpt.com

[17] Omer, M.Y., Hamza, A.A. and Musa, M.T. (2014) Penetrating Abdominal Injuries: Pattern and Outcome of Management in Khartoum. *International Journal of Clinical Medicine*, **5**, 18-22. https://doi.org/10.4236/ijcm.2014.51004

[18] Ayite, A., Etey, K., Fekete, L., Dossin, M., Tchatagba, K., Senah, K., *et al.* (1996) Les plaies pénétrantes de l'abdomen au CHU de Lomé à propos de 44 cas. *Médecine d'Afrique Noire*, **43**, 642-646. https://www.scirp.org/reference/referencespapers?referenceid=3093859

[19] Kanté, L., Togo, A., Diakité, I., Dembélé, B.T., Traoré, A., Coulibaly, Y., *et al.* (2013) Plaies pénétrantes abdominales par arme dans le service de chirurgie générale du CHU Gabriel-Touré. *Mali Médical*, **28**, 34-38. https://pubmed.ncbi.nlm.nih.gov/30049165/?utm_source=chatgpt.com

[20] Daban, J.L., Bensalah, M., Hofmann, C., Goudard, Y., Pons, F. and Debien, B. (2012) Spécificités de la prise en charge des traumatismes pénétrants. *Urgences/SFMU*, **68**, 1-13.

[21] Goodman, C.S., Hur, J.Y., Adajar, M.A. and Coulam, C.H. (2009) How Well Does CT Predict the Need for Laparotomy in Hemodynamically Stable Patients with Penetrating Abdominal Injury? A Review and Meta-Analysis. *American Journal of Roentgenology*, **193**, 432-437. https://doi.org/10.2214/ajr.08.1927

[22] Muller, L., de la Coussaye, J.E., Prudhomme, M. and Eledjam, J.J. (1999) Traumatic Retroperitoneal Hematomas. Elsevier, 555-570.

[23] Bège, T., Berdah, S.V. and Brunet, C. (2012) Les plaies par arme blanche et leur prise en charge aux urgences. *Journal Européen des Urgences et de Réanimation*, **24**, 221-227. https://doi.org/10.1016/j.jeurea.2012.10.006