Scientific Research Publishing

Surgical Science, 2021, 12, 204-210
https://www.scirp.org/journal/ss
ISSN Online: 2157-9415
ISSN Print: 2157-9407

Abdominal Trauma Management: About 62 Cases at the Department of General Surgery of Hôpital Sominé DOLO de Mopti, Mali

Djibril Traoré[1], Bréhima Traoré[1], Fodé Mory Keita[2], Dramane Cissé[1], Modibo Coulibaly[3*], Mory Koné[1], Abdoul Karim Djimdé[1], Kiffery Ibrahim[1], Korotimi Mallé[1], Abdoulaye Traoré[4], Oumar Guindo[5], Mathias Diassana[1], Pierre M. Coulibaly[6], Bakary T. Dembélé[7], Pierre A. Togo[7]

[1]Department of General Surgery, Hôpital Sominé DOLO de Mopti, Mopti, Mali
[2]Department of Surgery, Polyclinique des armées, Kati, Mali
[3]Department of Biomedical Laboratory, Hôpital Sominé DOLO de Mopti, Mopti, Mali
[4]Department of Anesthesia and Resuscitation, Hôpital Sominé DOLO de Mopti, Mopti, Mali
[5]Department of Public Health, Hôpital Sominé DOLO de Mopti, Mopti, Mali
[6]Department of Gynecology and Obstetrics, Hôpital Sominé DOLO de Mopti, Mopti, Mali
[7]Department of General Surgery, CHU Gabriel Touré, Bamako, Mali
Email: dtdjibsonl28@gmail.com, drbrehimat2@gmail.com, keitaf70@yahoo.fr, djennecisse@yahoo.fr, *modibocoulibaly@yahoo.com, kamsakone17@gmail.com, vieuxdjimde@yahoo.com, mallekoro@gmail.com, ngoaabdoulaye@yahoo.fr, barugdo@yahoo.fr, mathiasdias@yahoo.fr, coulipierre@yahoo.fr, btdembele@gmail.com, ap.togo@yahoo.fr

How to cite this paper: Traoré, D., Traoré, B., Keita, F.M., Cissé, D., Coulibaly, M., Koné, M., Djimdé, A.K., Ibrahim, K., Mallé, K., Traoré, A., Guindo, O., Diassana, M., Coulibaly, P.M., Dembélé, B.T. and Togo, P.A. (2021) Abdominal Trauma Management: About 62 Cases at the Department of General Surgery of Hôpital Sominé DOLO de Mopti, Mali. *Surgical Science*, **12**, 204-210.
https://doi.org/10.4236/ss.2021.126022

Received: May 19, 2021
Accepted: June 26, 2021
Published: June 29, 2021

Abstract

We undertook a prospective and descriptive observational study on abdominal trauma from February 1, 2016 to August 31, 2017. The aim of this work was to identify the typology and management of abdominal trauma cases in our surgery department. Overall, abdominal trauma represented 3.54% (62/1751) of all surgeries during the study period. Among the 62 cases, men accounted for 59 and women for 3. The sex ratio was 19.67. The mean age was 24 ± 15 years. Road accidents were the most represented with 43.5% of cases. The couple of signs, hypovolemic shock and abdominal pain and decrease on blood pressure were the prominent clinical symptoms with 100.0%, and 50.0% of cases, respectively. Abdominal ultrasound and abdominal x-ray without contrast were performed in 67.0% and 18.0% of cases, respectively. Abdominal trauma was divided into two entities: contusion 68% and wounds 32%. Medical treatment was sufficient in 23.00% of cases. Laparotomy as a surgical approach was performed in 77.0% of cases. Local hemostasis plus drainage (27.08%), splenectomy (25.00%), suture (14.58%), hemostasis by tamponade (8.33%) and colostomy (2.08%) were undertaken as surgical pro-

cedures when it came to deal with contusions. Debridement of wounds plus suture and hemostasis by tamponade was performed in 18.73% and 4.16 cases, respectively. The most observed lesions were those of the spleen with 27.42% and those of the small bowel with 24.19%. The postoperative follow-up was straightforward in 83.33% of cases. The overall mortality was 4.17%.

Keywords

Trauma-Abdomen-Emergency-Hôpital, Sominé DOLO de Mopti

1. Introduction

Abdominal trauma (AT) is defined as a contusion and/or a wound of the abdomen. Contusion is a closed trauma without a solution of continuity between the peritoneal cavity and the outside [1]. Wounds correspond to a communication traumatic of the peritoneal cavity with the exterior via a wounding agent (firearm, bladed weapon) [1]. Injuries from violence or accidents are the second leading cause of death in the world [2]. This mortality is directly related to the severity of the trauma and the delay in treatment [2]. In France, bladed weapons are the main agents involved [3] and penetrating trauma is infrequent (10% to 15%) of all trauma [4]. In the United States, abdominal trauma accounts for up to 70% of trauma, with a majority of gunshot wounds [4]. All intra-abdominal organs can be affected during an abdominal contusion ranging from rupture of solid organs (Liver; Spleen; Kidneys; Pancreas) to hollow organs (aorta; vena cava; mesentery) which are responsible for internal bleeding [1]. Damage to hollow organs results in peritonitis. In traumatic wounds of the abdomen, the most common wounding agents are bladed weapons, firearms and explosive agents. Visceral lesions can be single or multiple with a path defined by the injuring agent. All intra-abdominal organs mobile or fixed can be affected [1]. The aim of this work was to determine the typology and the management of abdomen trauma at Hôpital Sominé DOLO de Mopti.

2. Patients and Methods

This was an observational prospective and descriptive study by successive recruitment from February 1, 2016 to August 31, 2017. It was performed in the general surgery department of Hôpital Sominé DOLO de Mopti. We enrolled all the patients admitted to our department for abdominal trauma with lesions and having given their informed consent or assent. Were not enrolled those patients admitted for other reasons than abdominal trauma or who did not give their consent. The parameters studied were: interview data for those who were conscious, physical examination, paraclinical data and those of intra and post-operative follow-up. Data were collected from survey sheets, medical records, outpatient records,

hospitalization records and operative report. Data were captured on Microsoft Excel 2013 and analyzed on Epi Info 7.2.0.1 version 2016. Pearson's chi2 was used for the comparison of proportions. The *p-value* < 0.05 was considered as the threshold of statistical significance.

3. Results

Out of 1751 patients received, 62 were victims of AT *i.e.* 3.54%. The sex ratio was 19.67. The age groups 11 - 20 followed by 21 - 30 were the most affected with 44.0% and 16.0%, respectively. The mean age was 24 ± 15 years with extremes ranging from 6 and 70 years old (**Figure 1(a)**). Road accidents 43.54% and criminal assaults 19.35% were the predominant circumstances of the occurrence of AT (**Table 1**). Depending on the nature of the wounding agent, bladed weapons (**Figure 2(a)**) and hoof stabs were found in 12.90% of cases each. Abdominal contusions represented 68.0% of cases versus 32.0% of abdominal wound cases (**Figure 1(b)**). At inspection, the abdominal wound 32.25% of cases including 8.06% of evisceration (**Figure 2(b)**) followed by abdominal distension 25.80% (**Table 2**) were the observed lesions. Abdominal ultrasound was performed in 67.0% of our patients and found 27.41% of splenic lesions, 15 cases (24.19%) of peritonitis, 33 cases (53.22%) of hemoperitoneum, 7 cases (11.29%) of simple penetrating wound, 5 cases (8.06%) of evisceration and 2 cases (3.22%) of eventration. Medical treatment was considered 23.0% of cases. Surgical management was performed in 77.0% of cases and midline laparotomy was the used surgical approach. We performed total splenectomy in 25.0% of cases, colostomy in 2.08% of cases and hemostasis by simple suture or tamponade (**Table 3**). The duration of the surgery ranged from 35 to 130 minutes. The postoperative consequences were straightforward in 83.33%. The evolution was marked by a morbidity rate of 12.50% (6 cases of wall suppuration) and 4.17% of mortality. The average length of hospital stays varied according to the types of AT: for abdominal contusion from 3 to 9 days and for the wound from 3 to 13 days.

Table 1. Distribution of patients according to the circumstance of occurrence.

Circumstance	Table Column Head	
	Number	%
Road accidents	27	43.54
Criminal assaults	12	19.35
Bovid horn blow	5	8.06
Fall from height	7	11.29
Sport accidents	6	9.67
Others	5	8.06
Total	62	100

Table 2. Distribution of sign according to the signs observed on physical examination.

Signs on physical examination	Table Column Head	
	Number	%
Abdominal distension	16	25.80
Punctiform wound without evisceration	15	24.19
Wound with evisceration	5	8.06
Hematoma	7	11.29
Normal	19	30.65
Total	62	100

Table 3. Breakdown by type of surgical intervention.

Type of trauma	Table Column Head	
	Number	%
Contusion		
Splenectomy	12	25.00
Local hemostasis + drainage	13	27.08
Suture	7	14.58
Hemostasis by tamponade	4	8.33
Colostomy	1	2,08
Wounds		
Suture	9	18.75
Hemostasis by tamponade	2	4.16
Total	48	100

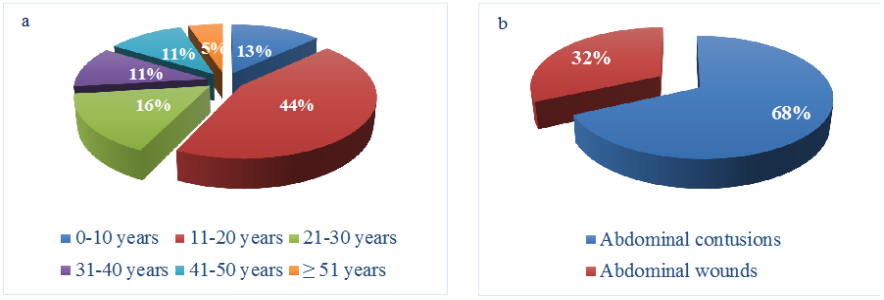

Figure 1. (a) Distribution of patients by age group, (b) Distribution by type of abdominal trauma. Department of general surgery, Hopital Somine de Mopti, Mali.

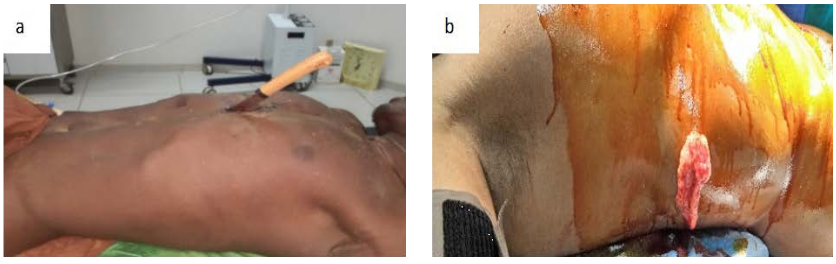

Figure 2. (a) Image of stab wound, (b) Abdominal gunshot trauma with evisceration. Department of general surgery, Hopital Somine de Mopti, Mali.

4. Discussion

We received 62 cases of AT out of 1751 surgical operations, ie 3.54%. Our patients accounted 59 men and 3 women. Men predominance was in line with those reported by Raherinantenaina F *et al.*, 2015 [2] and those reported by Khalid R *et al.*, 2014 [5]. The high frequency of AT in the age groups [11 - 20 years] and [21 - 30 years], 40% and 16%, respectively can be explained by hyperactivity at this age, exposure to roads accidents (students), falls from the height of trees in the bushes (cultivators) and by the increasing crime in our country, particularly in Mopti region. The young predominance in AT was also reported by Khalid R *et al.*, 2014 [5]. Various studies on AT have shown that road accidents (RA) are the leading cause of abdominal contusions, while abdominal wounds are caused by stabbing attacks [6]. In our study, RA represented the most frequent etiology with 43.54%, this result is close to that reported by Khalid R *et al.*, 2014 [5]. In civilian practice, the white weapon is the most common causal agent [7]. Bladed weapons and the hoof strike in our study were found in 12.90% of cases each. This can be explained on the one hand, by the increasing criminality among students due to the easy acquisition and handling of bladed weapons and on the other hand, by the activities of farmers who frequently use animal drawn carts. Closed AT is 4 times more frequent than open AT [8]. In our series, abdominal contusions accounted for 68.0% and this was due to carelessness in road traffic and falling from height while picking tree leaves in the bush. This result differs from that of Raherinantenaina F. *et al.*, 2015 [2]. The difference could be explained by the circumstance of occurrence, which was dominated by the RA in our series. Paraclinical exploration was dominated by abdominal ultrasound 67.0%. We did not perform CT scans due to the unavailability of the device during the study period. Taking into account the anatomical relationships of the abdominal cavity on the one hand, and the violence of the trauma on the other hand, extra-abdominal lesions associated with AT are very common [2] [9]. Besides splenic lesions which represented 17 cases (27.42%), we recorded one case of kidney injury (1.61%) of cases in our study. This proportion is lower than those reported by Mutter D.A. *et al.*, 2005 [10] who reported 107 cases (15.3%) of kidney injury. This could be explained by the small size of our sample. The management of AT cases follows controlled and well-codified rules. The prognosis depends on their correct application of these rules. Important resuscitation phase must be started from the pre-hospital transport. At reception, patients were sorted according to the circumstances of the injury and the clinical condition. After the initial clinical examination, immediate resuscitation was started depending on the clinical condition to maintain vital functions. The classic gestures of emergency resuscitation were undertaken. In our series, after the biological assessment; medical treatment began with the correction of fluid and electrolyte disorders, administration of sedatives, sera-vaccination in wound cases and antibiotic-prophylaxis. Currently, whether this is sufficient, medical treatment remains the best option for the management of AT [2]. In our study,

14 patients (23.0%) had successfully received medical treatment thus avoiding surgical intervention. Emergency laparotomy remains classic in view of the suggestive clinical and paraclinical picture. It was performed in 77.0% of cases. The midline route is the best indicated and the most used during emergency laparotomy [10]. Like some authors, we practiced this surgical approach because it is quick and easy. During our study, the lesions of the solid organs represented 43.56% and those of the hollow organs accounted for 27.43%. We found 27.42% splenic lesion and splenectomy was performed in 25% of cases. Our proportion of splenectomy is lower than that reported by Dembélé B.T. *et al.*, 2014 [11] who reported 58.9% of splenectomy. This difference could be explained not only by the size of the sample but also by the mechanism of the trauma. Unlike small bowel lesions, it is exceptional to perform simple suturing of a colonic wound in an emergency context [10]. In our study, two patients presented with colonic lesions, we performed a simple suture in one and given the importance of the lesions, a Hartmann colostomy in the other. In stab wounds with evisceration of the omentum without organ damage, resection of the exteriorized omentum was the basis of the surgery. We had a mortality rate of 4.17%, which was significantly lower than that reported by Dembélé, B.T. *et al.*, 2014 [11] who reported 4.7%, p-value < 0.005. On the other hand, the mortality in our series was comparable to that obtained by Ndong A. *et al.*, 2018 [12] who reported a mortality of 3.2%. The difference in mortality between our series and that of B.T *et al.*, 2014 [11] could be linked to the small size of our sample.

5. Conclusion

Our data shed light on the place of AT in our structure and their link with RA increasing crime in our cities and rural work. Our results call for more caution in road traffic for young people and during field work for farmers.

Acknowledgements

We are grateful to all patients of this study; the staff of Mopti Hospital, Hôpital Sominé DOLO de Mopti, Mali, Academic Hospital Hôpital Gabriel Touré, Bamako, Mali for their assistance.

Statement of Informed Consent

The patients gave fully informed written consent prior to this publication.

Conflicts of Interest

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

References

[1] Menegaux, F. (2004) Plaies et contusions de l'abdomen. *EMC-Chirurgie*, **1**, 18-31. https://doi.org/10.1016/j.emcchi.2003.10.001

[2] Fanomezantsoa, R., Davidà, R.S., Tianarivelo, R., Fabienne, R.L., Aina, R.T., Auberlin, R.F., Allen, H.F. and Nirina, R.R. (2015) Traumatismes fermés et pénétrants de l'abdomen: Analyse rétrospective sur 175 cas et revue de la littérature. *The Pan African Medical Journal*, **20**, 129. https://doi.org/10.11604/pamj.2015.20.129.5839

[3] 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

[4] Monneuse, O.J., Barth, X., Gruner, L., Pilleul, F., Valette, P.J., Oulie, O. and Tissot, E. (2004) Les plaies pénétrantes de l'abdomen, conduite diagnostique et thérapeutique. A propos de 79 patients [Abdominal Wound Injuries: Diagnosis and Treatment. Report of 79 Cases]. *Annales de Chirurgie*, **129**, 156-163. (In French) https://doi.org/10.1016/j.anchir.2004.01.013

[5] Khalid, R., Youssef, N. and Benacer, F. (2015) La place du traitement non opératoire des contusions abdominales dans les pays en voie de développement. *Pan African Medical Journal*, **20**, 132. https://doi.org/10.11604/pamj.2015.20.132.1212

[6] Etrie, P.H. (1976) Chirurgie d'urgence (Paris). *Ed Masson*, **34**, 16.

[7] Arvieux, C., Voiglio, E., Guillon, F., Abba, J., Brun, J., Thony, F. and Letoublon, C. (2013) Contusions et plaies de l'abdomen. *EMC-Gastro-entérologie*, **8**, 1-14. https://doi.org/10.1016/S1155-1968(12)56562-4

[8] Blayac, P.M., Kessler, N., Lesnik, A., Lopez, F.M., Bruel, J.P. and Taourel, P. (2002) Traumatismes du tube digestif. EMC-Med (Editions Scientifiques et Médicales Elsevier SAS, Paris, tous droits réservés), Radiodiagnostic-Appareil Digestif, 33-016-A-40, 7 p.

[9] Ojo, E.O., Ozoilo, K.N., Sule, A.Z., Ugwu, B.T., Misauno, M.A., Ismaila, B.O., Peter, S.D. and Adejumo, A.A. (2016) Abdominal Injuries in Communal Crises: The Jos Experience. *Journal of Emergencies, Trauma, and Shock*, **9**, 3-9. https://doi.org/10.4103/0974-2700.173867

[10] Mutter, D.A. and Schmidt, M.C. (2005) Contusions et plaies de l'abdomen. *EMC-Med*, **2**, 424-447. https://doi.org/10.1016/j.emcmed.2005.01.001

[11] Dembélé, B.T., Kanté, L., Traoré, A., *et al.* (2014) Traumatismes de la rate dans le service de chirurgie générale du CHU Gabriel Touré. *Journal Africain d'Hépato-Gastroentérologie*, **8**, 152-155. https://doi.org/10.1007/s12157-014-0542-z

[12] Ndong, A., Sarr, I.S.S., Gueye, M.L., Seye, Y., Diallo, A.C., Thiam, O., Cissé, M., Ka, O. and Dieng, M. (2018) Aspects diagnostiques et thérapeutiques des traumatismes abdominaux: À propos 68 cas. *Journal Africain de Chirurgie Digestive*, **18**, 2474-2478. http://www.researchgate.net/publication/342453733_ASPECTS_DIAGNOSTIQUES_ET_THERAPEUTIQUES_DES_TRAUMATISMES_ABDOMINAUX_A_PROPOS_68_CAS