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Penetrating Wounds of the Abdomen: Therapeutic Aspects at the Fousseyni DAOU Hospital in Kayes, Mali

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Abstract **Original Research Article**

Objective: To evaluate the criteria for therapeutic choice between systematic laparotomy and non-operative treatment "selective abstentionism" in penetrating wounds of the abdomen. ***Patients and methods***: This is a retrospective study performed at the second referral hospital of Kayes from January 1, 2016 to December 31, 2020. We included all patients admitted to the department for penetrating wounds of the abdomen. The parameters studied were visceral injuries, systematic laparotomy, non-operative treatment "selective abstentionism" ***Results:*** We collected 66 patients of which 57 were men and 9 were women, i.e. a sex ratio of 6.3. The mean age was 25.6 years with a standard deviation of 28.72 years and extremes (7 years - 60 years). Criminal assault was the main circumstance of occurrence in 34 cases (51%), the vulnating agent was a knife in 38 cases (58%), the site of the lesions was para umbilical in 12 cases (18%), the most eviscerated organ was the omentum in 25 cases (54%). Systematic laparotomy was performed in 41 cases (62%), during this operation the white laparotomy was performed in 6 cases (15%), intraoperatively the wounds of the small intestine were the most frequent in 15 cases (37%), the operative gesture was the simple suture in 24 cases (58%) The morbidity of the systematic operative treatment was 15% (4 parietal suppurations, 2 fistulas of the anastomosis). Mortality was 5% (2 cases). The non-operative treatment "selective abstentionism" was practiced in 25 cases (38%), we had 2 cases of therapeutic failure that required a secondary surgical intervention the lesions in per operative were 1 case of stomach wound and 1 case of wound of the right colonic angle. The morbidity was nil. ***Conclusion****:* In the management of penetrating wounds of the abdomen, systematic laparotomy has the advantage of making the lesion assessment while taking into account to avoid the patient a white laparotomy, the non operative treatment must be based on strict selection criteria.

Keywords: Penetrating wound, abdomen, therapeutic choice.

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INTRODUCTION

A wound of the abdomen is said to be penetrating, when the causal agent has created a solution of continuity of the abdominal wall with peritoneal effraction. When it is complicated by visceral damage, the wound is said to be perforating [1,2].

The frequency of penetrating wounds has increased worldwide and varies from country to country. This is related to an increase in crime, the availability of weapons and less armed conflict [3]. In the USA, the prevalence of penetrating abdominal firearm wounds has been estimated at 63077cas per year [4].

The management of penetrating abdominal wounds is currently a controversial issue. Indeed, the debate is between the classical attitude of systematic exploratory laparotomy Nejjar[5] and an attitude called "selective abstentionism" advocated by Shaftan[4]. In Mali, we have no data on the management of these lesions, hence the interest of this pilot study which aimed to evaluate the criteria for therapeutic choice between systematic laparotomy and non-operative treatment "selective abstentionism" in penetrating wounds of the abdomen.

PATIENTS AND METHODS

This was a retrospective study conducted between January 1, 2017 and December 31, 2020 in the general surgery department at the second referral

hospital in Kayes. All patients hospitalized in the department for penetrating abdominal wounds were included in this study.

Criteria: the diagnosis of penetrating abdominal wound was based on the penetrating nature of the wound (effraction of the peritoneum) with or without evisceration of the visceral lesion.

RESULTS

We collected the record of 66 patients, there were 57 males and 9 females, a sex ratio of 6.3. The mean age of the patients was 25.6 years with extremes of 7-60 years.

Criminal assault was the main circumstance of occurrence of penetrating abdominal wounds in 51% (34) of cases, the vulnating agent was the knife in 58% (38) of cases, pain was the main functional sign, the site of lesions was para umbilical in 18% (12) of cases. The evisceration through the wound was in 46 cases (70%), the most eviscerated organs were the omentum in 54% (25) of the cases (Cf. fig 1) and the small intestine in 31% (14) of cases.

The patients were divided according to the therapeutic modalities, systematic surgery and non-operative treatment "selective abstentionism".

Systematic laparotomy was performed in 62% (41) of the cases, visceral lesions represented 85% (35) of the cases, the wounds of the hollow viscera were the small intestine in 37% (15) (Cf. fig 2), the colon 20% (8) of the cases and the stomach 7% (3) (Cf. fig 3) (Cf. table 1). The operative procedure was a simple suture in 58% (24) of the cases (Cf. fig 4), anastomotic resection was performed in 27% (11) of the cases. During the systematic surgical treatment, the white laparotomy was 15% (6).

Morbidity for systematic laparotomy was 15% (2 anastomotic fistulas, 4 parietal suppurations), mortality was 5% (1 hemorrhagic ballistic wound of the liver, 1 ballistic wound dislocating mesentery and small intestine).

The non-operative treatment "selective abstentionism" (Cf. fig 5) was observed in 38% (25) of the cases, the selection of the patients was based on a certain number of criteria: a simple wound with or without epiplocele, without flow of stool or digestive hemorrhage through the wound, after this selection a protocol of follow-up was elaborated in the service and a strict monitoring "armed expectation" (Cf. table 2). The failure of the non-operative treatment was 8% (1 puncture wound of the stomach, 1 wound of the right colonic angle), the operative gesture was the simple suture. The morbimortality of the non-operative treatment was nil.

Fig-1: Epiplocele and enterocele

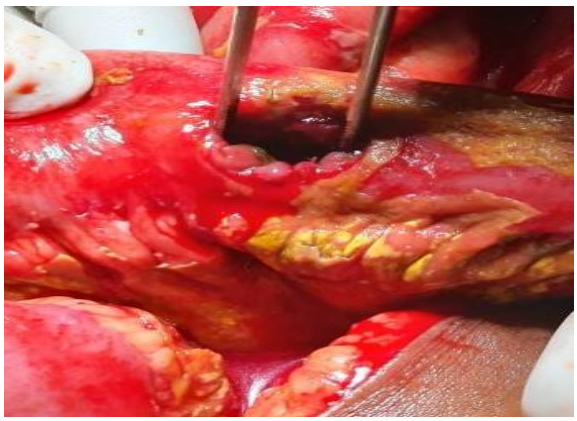

Fig-2: Small intestine wound

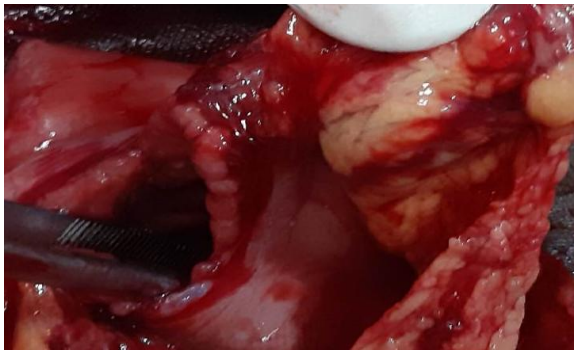

Fig-3: Stomach wound

Fig-4: Sutured liver wound

Fig-5: Non-operative treatment

Table-I: Distribution of patients according to the circumstances of occurrence of penetrating abdominal wounds

circumstances	Effectif	percentage
Criminal assault	34	51
P.R.A	13	20
Family conflicts	9	13
Accidental firearm	7	11
Autolyse	3	5
Total	66	100

P.R.A: public road accident

Table-II: Distribution of patients according to the vulnating agent

Vulnerable agent	Effectif	percentage
White weapon	38	58
Firearm	18	27
Iron bar	6	9
Tying up	3	4
pen	1	2
Total	66	100

Table-III: Distribution of patients according to intraoperative lesions

viscera	Effectif	percentage
Small intestine	15	37
Colon	8	20
Liver	4	10
Rate	3	7
Stomach	3	7
Diaphragm	1	2
Bladder	1	2
Absence of lesion	6	15
Total	41	100

Table-IV: Monitoring during non-operative treatment

Monitoring parameters	J0 Normal	J0 Abnormal	J1 Normal	J1 Abnormal	J2 Normal	J2 Abnormal	J3 Normal	J3 Abnormal
Blood pressure	25	0	25	0	25	0	25	0
Pulse/F.R	25	0	25	0	25	0	25	0
Hemoglobin level	25	0	25	0	25	0	25	0
Signs of peritonism	25	0	25	0	23	2	23	0
U.R.A	25	0	25	0	23	2	23	0
Abdominal ultrasound	25	0	25	0	23	2	23	0

F.R: respiratory frequency
U.R.A; unprepared radiography of the abdomen

DISCUSSION

The management of penetrating abdominal wounds (PPA) requires two therapeutic situations. In front of a PPA with enterocele, a stool flow, a digestive hemorrhage, signs of peritonism, a wound by firearm with or without exit door of the projectile, the systematic laparotomy was necessary in our study. For some authors, it should be systematic in the case of any APS [5,6].

In our series, we performed systematic laparotomy in 62% of cases [4, 1]. Dieng [12] in Senegal reported 67.7%. This difference in figures could be explained by the concern to avoid doubt as to the existence or not of a visceral lesion, especially to avoid the risk of ignoring it [1,5].The lesions encountered intraoperatively were the small intestine during our study (37%). In the literature, Masso. M [6] in Cameroon (31.39%), Angate [7] in the UK (23.53%), Robert. A [8] in the USA (17.4%), this could be explained by the length and mobility of the small intestine. After the small bowel lesions, it is the lesions

of the colon, stomach and liver that are frequent in several authors [5, 9, 10, 11]. The operative procedure was the simple suture in our study (58%) of the cases, it was the most practiced for other authors [4, 5, 9, 12]. Simple suture or anastomotic resection must take into account the time between the occurrence of the accident and the operation, the degree of fecal contamination and the condition of the patient [4,5]. During routine laparotomy there was 15% of blank laparotomy, it has been found in all studies with rates that vary between 20 and 40% [1, 12-15]. This high rate of blank laparotomy is observed in centers where the dogma of systematic laparotomy was applied. These findings led some teams to selective abstentionism, which aimed to operate only on patients with obvious visceral lesions, subject to "armed expectant" surveillance. The morbidity of systematic laparotomy in our series was 15%, in the literature it is around 6 to 20% [1, 4, 12, 13]. It was dominated by parietal suppurations in all the authors, which could be explained by the degree of sepsis of the PPA despite antibiotic prophylaxis. Mortality was 5% in our series, 2 cases due to a firearm, it is 0 to 10% in the literature [2, 5, 17].

Because of the high number of laparotomies, some authors, such as Shaftan [3], advocate non-operative treatment (selective abstentionism).

In our series, the non-operative treatment was 38% and was applied to patients with an epiplocele without stool discharge or digestive hemorrhage and without signs of peritonism. The procedure consisted of a reintroduction of the omentum or a partial omentectomy after local anesthesia and strict "armed expectation" surveillance. In our study, non-operative treatment was applied only to PPA caused by stabbing; other authors propose extending it to PPA caused by firearms [16]. In Senegal, Dieng [12] found 32.2%. The failure of non-operative treatment was 8% in our series, one (01) puncture wound of the fundus of the stomach, this lack of knowledge of stomach wounds has been found in the literature [5], one (01) wound of the right colonic angle which was collapsed by the liver, this failure rate is low compared to those found in the literature which varies from 10 to 50% [6, 12, 13], this could be explained by our selection criteria. The operative procedure was the simple suture, the morbimortality was nil with the non-operative treatment, this rate of 0% has been found in the literature [12, 13].

CONCLUSION

In the management of penetrating wounds of the abdomen, systematic laparotomy has the advantage of assessing the lesions in the absence of sufficient technical platform, but while taking into account the need to avoid a blank laparotomy for the patient, non-operative treatment must be based on strict selection criteria.

REFERENCES

1. Ayite, A., Etey, K., Feteke, L., Dossim, M., Tchatagba, K., Senah, K., ... & James, K. (1996). Les plaies pénétrantes de l'abdomen au chu de lomé-a propos de 44 cas. *Médecine d'Afrique noire*, *43*(12), 642-646.
2. Sarre, B., Sene, M., Seck, M., Faye, M., & Ougougbemy, M. (2000). Plaies pénétrantes de l'abdomen en pratique de guerre. Expérience de Bissau à propos de 20 cas. *Revue internationale des services de santé des forces armées*, *73*(4), 229-234.
3. Shaftan, G. W. (1960). Indications for operation in abdominal trauma. *The American Journal of Surgery*, *99*(5), 657-664.
4. Monneuse, O. Y., Barth, X., Gruner, L., Pilleul, F., Valette, P. J., Oulie, O., & Tissot, E. (2004, April). Les plaies pénétrantes de l'abdomen, conduite diagnostique et thérapeutique. À propos de 79 patients. In *Annales de chirurgie* (Vol. 129, No. 3, pp. 156-163). Elsevier Masson.
5. Nejjar, M., Bennani, S., & Zerouali, O. N. (1991). Plaies pénétrantes de l'abdomen. A propos de 330 cas. *Journal de chirurgie (Paris. 1908)*, *128*(8-9), 381-384.
6. GROUPE, A. (1996). Plaies pénétrantes asymptomatiques de l'abdomen par arme blanche: pour une exploration sélective. *Médecine d'Afrique Noire*, *43*(2).
7. YANGNI-ANGATE, A., CORNET, L., DAGO, A., KEBE-MEMEL, J. M., & KANGA, M. B. (1987). Les traumatismes ouverts de l'abdomen en milieu ivoirien: étude rétrospective d'une série de 652 cas. *Chirurgie (Paris)*, *113*(5), 451-459.
8. Cherry, R. A., Eachempati, S. R., Hydo, L. J., & Barie, P. S. (2005). The role of laparoscopy in penetrating abdominal stab wounds. *Surgical Laparoscopy Endoscopy & Percutaneous Techniques*, *15*(1), 14-17.
9. Ahmed, N., Whelan, J., Brownlee, J., Chari, V., & Chung, R. (2005). The contribution of laparoscopy in evaluation of penetrating abdominal wounds. *Journal of the American College of Surgeons*, *201*(2), 213-216.
10. Smith, J., Caldwell, E., D'Amours, S., Jalaludin, B., & Sugrue, M. (2005). Abdominal trauma: a disease in evolution. *ANZ journal of surgery*, *75*(9), 790-794.
11. Eric. B., Andre, L., Tarek, R., Amina. B., Julie., L., David., C. (2005). Penetrating thoraco-abdominal injury in Quebec: implications of surgical training And maintenance of competence. *J Can chir*, *48*(4) ; 284-287
12. Dieng, M., Wilson, E., Konaté, I., Ngom, G., Ndiaye, A., Ndoye, J. M., ... & Touré, C. T. (2003). Plaies pénétrantes de l'abdomen:" abstentionnisme sélectif" versus laparotomie systématique. *e-mémoires de l'Académie Nationale de Chirurgie*, *2*(2), 22-25.

13. El Idrissi, H. D., Kafih, M., Ajbal, M., Ridai, M., Sarf, I., Salmi, A., ... & Zerouali, N. O. (1994). Les plaies pénétrantes de l'abdomen. Résultats des 2 attitudes classique et sélective dans la prise en charge de 249 plaies. *J Chir (Paris)*, 375-7.
14. Guiberteau, B., Kohen, M., Borde, L., Sartre, J. Y., & Bourseau, J. C. (1992). Le dogme de la laparotomie exploratrice doit-il être maintenu en présence d'une plaie de l'abdomen? Discussion à propos de 176 observations. *Journal de chirurgie (Paris. 1908)*, *129*(10), 420-425.
15. Sano, D., Zongo, N., Bonkoungou, P. G., Zida, M., & Sanou, A. (2010). Plaidoyer pour une réduction du taux de laparotomies blanches dans les plaies pénétrantes de l'abdomen au CHU Yalgado Ouedraogo (CHUYO). *Médecine d'Afrique noire*, *57*(8-9), 397-400.
16. Velmahos, G. C., Demetriades, D., Toutouzas, K. G., Sarkisyan, G., Chan, L. S., Ishak, R., ... & Berne, T. V. (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*(3), 395.
17. Mahajna, A., Mitkal, S., Bahuth, H., & Krausz, M. M. (2004). Diagnostic laparoscopy for penetrating injuries in the thoracoabdominal region. *Surgical Endoscopy And Other Interventional Techniques*, *18*(10), 1485-1487.