

CASE STUDY

Subject: Surgery

Penetrating abdominal trauma in a general hospital of the second level: Four years analysis (2014-2017)

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 Unit

SUMMARY

Introduction:

Patients with open or penetrating abdominal trauma are usually subjected to exploratory laparotomy, however, in selected cases, many surgeons decide not to operate and keep their patients under observation since this expectant attitude has avoided unnecessary laparotomies throughout the world.

Material and Method:

An observational, retrospective and cross-sectional study of open abdominal trauma was conducted over a period of four years. Inclusion criteria: all open abdominal traumas of any age, of both sexes and by any etiology. Exclusion criteria: closed abdominal trauma, multiple trauma patients, cranioencephalic trauma and orthopedic trauma without abdominal involvement.

Results:

During the study period, 38 cases of abdominal trauma were collected, of which 26 were open. Seventeen male and nine female cases. At admission, two patients were reported in shock and 24 were stable. Twenty-two cases were exclusively abdominal and four cases were thoraco-abdominal. Twenty-two cases were by the knife; two cases per firearm; two cases per rods. Three patients required a transfer to the ICU (splenectomy, iliac artery injury, and packaging). There were no deaths.

Discussion:

The decision to intervene surgically depends on whether the patient is stable or unstable, in the first case there is time to do the necessary studies, in the second the patient should be laparotomized to control the bleeding that causes the patient's state of shock. In our hospital, we have a shock unit and this helps greatly for the primary care of the injured and its evaluation by surgery.

1. Introduction

Patients with open or penetrating abdominal trauma are usually subjected to exploratory laparotomy, however in selected cases many surgeons decide not to operate and keep their patients under observation since this expectant attitude has avoided

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unnecessary laparotomies throughout the world; but to support this expectant attitude, additional laboratory and cabinet studies are required, in a Turkish study 90% of surgeons almost half of them do not observe this conservative behavior arguing that they did not want to put their patients' lives at risk nor your own risk. In precarious conditions prehospital mortality is very important, however, if reach a suitable hospital, the chances of survival are high. [1][2]

Material and Method:

An observational, retrospective and cross-sectional study of all patients with open abdominal trauma in a general community hospital of the second level was conducted over a period of four years. Inclusion criteria: all open abdominal traumas of any age, of both sexes and by any etiology. Exclusion criteria: closed abdominal trauma, multiple trauma patients, cranioencephalic trauma and orthopedic trauma without abdominal involvement. Descriptive statistics were used for the results obtained.

Results

During the study period, 38 (100%) cases of abdominal trauma were collected, of which 26 (68%) were open (Table 1). 17 (65%) male cases and nine (35%) female cases. At admission, two patients (8%) were reported in shock and 24 stable (92%). 22 cases (85%) were exclusively abdominal and four (15%) cases were thoraco-abdominal. Twenty-two (85%) cases were by knife and two (8%) cases by firearm, two (8%) cases by rods to suffer falls in construction works. As for the etiology, this is presented in Table 2. The statistical analysis is presented in Table 3. Two (8%) tomographies were taken and three ultrasounds(12%); one case was a self-inflicted knife injury, the injured organs, and their treatment are presented in Table 4, of these cases twelve (32%) should not be operated due to the nature of their injuries. Three (8%) patients required a pass to the ICU (splenectomy, iliac artery injury, and packaging). There were no deaths in this review.

Table 1. General data in 26 cases of open abdominal trauma.

Year	Cases	%	Male	%	Female	%
2014	4	15	2	12	2	22
2015	4	19	4	24	0	0
2016	8	31	5	29	3	45
2016	10	35	6	35	4	33
Total	26	100	17	100	9	100

Table 2. Etiology in 26 cases of open abdominal trauma.

Etiology	Cases	%
White weapon	22	84
Fall	2	8
Shotgun	2	8
Total	26	100

Table 3. Statistical analysis of 26 patients with penetrating abdominal trauma.

Parameters	Age	Hemoglobin g/dL	HS*
Average	29	12.4	6
Median	28	12.5	5
Mode	28	12.5	3
SD	10.2	1.7	4.8
Minimum	14	9.0	2
Maximum	54	16.3	19

*HS = Hospital Stay

Table 4. Injured organs and treatment of penetrating abdominal trauma in 26 patients.

Case	Committed organ (s)	Treatment
1	Stomach; Liver; Pleura	Primary closure; Raffia; Pleural seal
2	Stomach; Pancreas	Raffia
3	Psoas left	Raffia
4	Colon laceration	Primary closure
5	Bladder	Cystorrhaphy
6	Ileum	Term-terminal anastomosis
7	Stomach	Raffia
8	Omentum Liver Grade I	Raffia
9	Omentum	Omentectomy
10	Colon; Jejunum	Primary closure
11	Abdominal wall hematoma	Hematoma evacuation
12	Colon; Abdominal wall hematoma	Primary closure; Hematoma evacuation
13	Transverse colon; Hemothorax	Primary closure; Colostomy; Pleural seal
14	Liver Grade I; Spleen Grade III; Hemothorax	Raffia; Splenectomy; Close diaphragmatic defect; Pleural seal
15	Colon; Liver; Pneumothorax	Primary closure; Raffia; Pleural seal
16	Stomach; Liver Grade II; Small intestine; Pancreas (pancreatic fistula)	Raffia; Primary closure
17	Right kidney Grade II	Raffia
18	Liver Grade I; Right breast	Raffia
19	Stomach; Duodenum; Right kidney Grade II	Raffia
20	Stomach; Transverse colon	Primary closure
21	Right kidney Grade II	Raffia
22	Liver Grade III	Raffia
23	Ileum	Primary closure
24	Liver Grade II	Raffia
25	Gastrocolic ligament	Raffia
26	Omentum	Hemostasis

Discussion

The penetrating abdominal trauma presents a risk of complications and depends on the number of transfused globular packages and the number of damaged organs, the time it takes for patients to reach the hospital and external injuries do not carry a higher risk of complications. [3]

Since 1990, the best way to check a traumatized abdomen patient was by FAST

ultrasound, however, the greatest utility of this method is in the trauma of closed abdomen or in thoracic injuries and of little use in isolated penetrating abdominal injuries. [4]

The decision to operate surgically depends on whether the patient is stable or unstable, in the first case there is time to do the necessary laboratory and imaging studies, in the second case the patient should be laparotomized to control the hemorrhage that causes the shock state of the patient since the lesion can be solid organ (liver, and/or spleen, with grade IV or V lesion) or retroperitoneal vascular. However, conservative management should be considered since morbidity and mortality are high in cases of severe hepatic injury. [5][6]

In our hospital we have a shock unit and this helps greatly for the primary care of the injured, however a study reports that the management with crystalloids in a massive transfusion in the first 24 hours without globular packages carries risks of high morbidity for failure organic, multiple, respiratory distress and abdominal compartment syndrome without being associated with nosocomial infections or mortality. [7][8]

The control of bleeding is a priority in any trauma event since the risk of exsanguination is high and can trigger the deadly triad (coagulopathy, hypothermia, and acidosis) hence the arterial gas monitors is very useful to discover early hypotension. On the other hand, to monitor coagulation thromboelastometry and thromboelastography are superior to traditional coagulation times. In the same way, resuscitation with crystalloid solutions should be cautious and keep the systolic blood pressure at 90 mmHg with 250 ml of aliquot solution (hypotensive resuscitation). The administration of O (-) globular packages is an alternative to replace the coagulation and platelet factors and thus prevent coagulopathy. Fresh frozen plasma, platelets and globular packages in a balanced manner must be transfused in severe patients. [9-11]

Now, the decision to operate or not to operate immediately corresponds to the surgeon and in a Cochrane analysis, they emphasize that when the patient is not in a state of shock or has peritonitis data, observation is recommended. [12]

In our cases, there were cases with diaphragmatic compromise resolved in a conventional manner as well as intraabdominal injuries. In the study of Özoğul B, *et al.*, they found that there is no relationship of this lesion with the morbidity and mortality of the patients, which was corroborated in our cases with an additional diaphragmatic injury. [13]

Regarding the use of diagnostic laparoscopy, in our cases it was not used, although it is recognized that it is useful in stable patients, decreases negative laparotomies minimizes morbidity and reduces days of hospital stay. [14]

Currently, patients with penetrating abdominal trauma are treated conservatively, especially in solid organ injuries, and in a study by Berg RJ, *et al.*, regarding the handling of injured spleen they obtained good results with conservative management.[14] In our study, all the injured spleens were removed.

Conclusion

The penetrating abdominal trauma in our environment is frequent, with an average of 26 patients in this period of study, hemodynamic stability is the rule. The main cause of injury is due to a knife, followed by injury due to falling height with impalement by rods of construction works, and finally, injuries by firearm in the last year reviewed, so we are

probably in an epidemiological transition from the cause of this type of injuries.

Surgical management of open abdominal traumas was exploratory laparotomy in all cases, however, it is acceptable because twenty (77%) cases of mixed lesions were found and only six (23%) cases could be treated conservatively.

Conflict of interest

The authors declare that they have no conflict of interest.

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Declaration

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Single Author.

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