

## **Penetrating and Blunt Abdominal Trauma in a General Hospital of Second Level. Analysis of Four Years**

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### **Abstract**

**Introduction:** Closed and isolated abdominal injuries occur infrequently during an accident and when they do occur they do not always require immediate surgical intervention.

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

**Results:** During the study period, 38 cases of abdominal trauma were collected. Upon admission, 5 patients were reported in shock and 33 were stable. 28 cases with open abdominal trauma and 10 with closed abdominal trauma. 29 cases were exclusively abdominal and 9 cases were thoracoabdominal. 3 tomographies and 6 ultrasounds were taken, 1 case was self-inflicted lesion.

**Discussion:** Abdominal trauma is divided into open and closed and because their diagnosis is different, the decision to operate or not to operate and the time to operate vary from case to case. In one study they found that the main cause of trauma was due to motor vehicles and falls and its main presentation was closed abdominal trauma. In our study, the main presentation was open trauma and the main cause was caused by a knife. Another study found that the main cause was the injury by firearm, which is not our case since we only had 2 cases in the last year.

**Keywords:** *Abdomen; Open Trauma; Blunt Trauma; Etiology; Shock; Stability; Surgery*

### **Introduction**

Isolated abdominal injuries occur infrequently during an accident and when they do occur they do not always require immediate surgical intervention. Currently, there is a tendency to preserve organs and in some countries, surgeons are rarely faced with these situations, but not in countries with social problems or high marginalization, so that surgeons in these countries should be able to interpret correctly the mechanisms of the lesions, adequately estimate the signs and symptoms and the physical examination, the radiological findings and establish whether the patient requires surgical intervention [1].

On the other hand, evaluation systems such as the ATLS have not been validated with rigorous randomized controlled studies before and after the trauma and their value leaves doubts about their effectiveness despite having been established in almost all the world but continues to be used as a tool in the absence of another system or even when its validity is undoubtedly demonstrated [2-5].

In Mexico, general surgeons continue to be very important in general hospitals due to the resolute capacity they have to attend, in addition to the conventional surgical resolution conditions, traumatic disorders normally healthy and/or with other comorbidities, i.e. a patient that we did not previously know and that we must attend to abdominal and/or thoracic injuries regardless of age or gender.

**Material and Method**

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

**Results**

During the study period, 38 cases of abdominal trauma were collected (Table 1). At admission five patients (13%) were reported in shock and 33 stable (87%). 26 cases (68%) with open abdominal trauma and 12 (32%) with blunt abdominal trauma. 28 cases (74%) were exclusively abdominal and 10 cases (26%) were thoracoabdominal. Regarding the etiology, this is presented in table 2. The statistical analysis is presented in table 3. Three tomographies and six ultrasounds were taken, true positive two and four were positive, two cases presented mild and moderate cranioencephalic trauma, one case it was a self-inflicted knife injury, the injured organs and their treatment are presented in the table 4, of these cases 12 (32%) should not have been operated due to the nature of their injuries. Three patients (8%) required a pass to the ICU (splenectomy, iliac artery injury and packaging). There were no deaths in this review.

Year	Cases	%	Male	%	Female	%	Open	%	Blunt	%
2014	8	21	6	21	2	20	4	14	4	33
2015	6	16	6	21	0	0	4	14	2	17
2016	13	34	8	29	5	50	9	32	4	33
2016	11	29	8	29	3	30	11	40	2	17
Total	38	100	28	100	10	100	26	100	12	100

**Table 1:** General data in 38 cases of open and blunt abdominal trauma.

Etiology	Cases	%
Knife or machete	23	61
Car	6	16
Fall	7	18
Gunshot	2	5
Total	38	100

**Table 2:** Etiology in 38 cases of open and blunt abdominal trauma.

Measure	Age	Hemoglobin g/dl	HS*
Average	29	12.3	8.2
Median	28	12.3	6
Mode	26	12.3	6
SD	10.8	1.9	7.1
Minimum	2	7.4	1
Maximum	60	16.3	35

**Table 3:** Statistical analysis of age, hemoglobin and days of in-hospital stay.

\*HS: Hospital Stay

## Discussion

Abdominal trauma is divided into open and closed (penetrating and non-penetrating) because their diagnosis is different, the decision to operate or not to operate and the time to operate vary from case to case. In a study by Leite S., *et al.* [6] they found in their casuistry that the main cause of trauma was due to motor vehicles and falls and its main presentation was closed abdominal trauma. In our study, the main presentation was open trauma and the main cause was due to a fight. Another study by Mnguni MN., *et al.* [7] found that the main cause was gunshot wounds, which is not our case since we only had 16 cases, mainly in the last two years.

The control of bleeding is a priority in any event of trauma since the risk of exsanguination is high and can trigger the deadly triad (coagulopathy, hypothermia and acidosis) hence the arterial blood 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 [8-18].

In our case, only one patient had to be packaged and none had risk of exsanguination, since the lowest hemoglobin was 10 (two cases), 9.9, 9.8, 9.3 and 7.4 g [arterial lesion]]. Only five ultrasounds (1.3%) and three tomographies (7.8%) were requested and obtained, which reflects the limited availability of these diagnostic aids in our environment and also the limited use of them when they are available. Ultrasound for abdomen is of little use except for thoracic cases, but tomography is of great support in abdominal trauma [19-21].

One of the organs that represent a major surgical challenge is the liver since this injury reaches up to 10% of mortality [22] and closed abdominal trauma is more frequent. In our review, we only had nine cases of this trauma with two cases of maximum degree III easy-to-resolve hepatic trauma.

Of the cases that did not require exploratory laparotomy, seven patients did not meet the requirements to operate and the remaining five could have been resolved by embolization, a service that we do not have in this hospital.

Isik A., *et al.* [23,24] in one of their studies about thyroid biopsies emphasize the need for surgeons to update themselves in the corresponding techniques to set criteria that can systematize procedures. Similarly, in another of his works on pilonidal cyst developed a new original technique which reduces the days of hospital stay, hospitalization costs and shortens the recovery of patients undergoing this technique.

## Conclusions

Abdominal trauma in our environment is rare, with an average of 10 cases per year.

The status at admission of patients in general is stability and very few occasions have a hypovolemic shock state and that indicates a correct prehospital care and effective medical-surgical care.

The main cause of injury is by a knife, however, firearm injuries begin to appear in the last year reviewed, so we are probably in an epidemiological transition.

Surgical management is doubtful because almost one fifth of lesions could be managed conservatively, however, having 0 mortality patients evolved satisfactorily despite unnecessary laparotomy. Having interventional radiology could further reduce the doubtful cases for exploratory laparotomy.

## Conflict of Interest

None.

## Ethical approval

None because it is a retrospective study.

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