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Clinical Study Of Penetrating Abdominal Injuries.

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ABSTRACT

Main aim in penetrating injuries should be immediate medical attention. So this study is being done to evaluate the various indications for emergency laparotomy and morbidity in penetrating abdominal injuries. This is study of 51 cases of penetrating injury to abdomen admitted to Tertiary Care Hospital during the period September 2020 to December 2022. All the patients with history of penetrating abdominal trauma requiring admission during the study period are included in this study. Documentation of patients, which included identification, history, clinical findings, diagnostic test, operative findings, operative procedure, complications during the stay in the hospital and during the subsequent follow-up period were all recorded on a proforma specially prepared. In the present study the laparotomy was therapeutic in 85 % of cases and in remaining 15% it was negative. In the present study, respiratory complication is the most frequent complication postoperatively accounting up to 28%, second most being intra-abdominal sepsis, wound infection and wound dehiscence accounting for 21.3% of them occurred in those with colonic and small bowel injury. Respiratory infection and Intra-abdominal sepsis were the frequent postoperative complication in the present study followed by wound infection.

Keywords: penetrating abdominal injuries. Laparoscopy, abdominal sepsis

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INTRODUCTION

Over the past year major advances were made in field of imaging, ultrasonography, fibre optics and injury assessment scoring systems, a more selective approaches being applied to the treatment of these injuries. This present approach is being adopted for abdominal injury management in contrast to the traditional mandate that all abdominal penetrating injuries should have surgical intervention. Because of increased rates of negative laparotomy with stab injuries, selective management was suggested by various studies [1]. After the World War, operative management replaced the expectant therapy and reduced mortality rates. Major improvement in the management of abdominal wounds occurred with the introduction of liberal use of antibiotics and blood transfusion [2]. In 1960, after observing the increased rate of negative laparotomy, Shaftan suggested the selective management of patients with stab wound. In a developing country like India where majority of population resides in villages and very few available trauma care centres are located in cities, the care of penetrating injuries patients is far from satisfactory. Main aim in penetrating injuries should be immediate medical attention [3, 4]. So this study is being done to evaluate the various indications for emergency laparotomy and morbidity in penetrating abdominal injuries.

MATERIALS AND METHODS

This is study of 51 cases of penetrating injury to abdomen admitted to Tertiary Care Hospital during the period September 2020 to December 2022. All the patients with history of penetrating abdominal trauma requiring admission during the study period are included in this study. Documentation of patients, which included identification, history, clinical findings, diagnostic test, operative findings, operative procedure, complications during the stay in the hospital and during the subsequent follow-up period were all recorded on a proforma specially prepared. Demographic data collected included age, sex, occupation and nature and time of the event leading to the injury.

After initial resuscitation and achieving hemodynamic stability, all patients were subjected to careful clinical examination. Depending on the clinical findings decision for further investigations such as four quadrant aspiration, local would exploration, X-ray abdomen, and ultrasound.

The decision for operative or non-operative management depended on the outcome of clinical examination and results of diagnostic tests.

Patients selected for non-operative or conservative management were placed on strict bed rest were subjected to serial clinical examination which included hourly pulse rate, blood pressure respiratory rate, and repeated examination of abdomen and other systems. Appropriate diagnostic test especially ultrasound of abdomen and CT scan of abdomen was repeated as and when required.

Apart from routine investigations abdomen X-ray was done in most of cases. Patients underwent four quadrant aspirations. Aspiration of blood which did not clot was taken as positive. When the aspirates clotted the test was taken as negative.

RESULTS

In the 51 cases studied, 47 cases were males and 4 cases were females. Homicidal stab injury was the commonest mode of penetrating abdominal injury followed by injury due to bull goring.

Table 1: Local wound exploration:

Peritoneal penetration	Number of patients	Percentage
Present	40	78
Absent	11	22
Total	51	100

All the patients with penetrating abdominal injuries underwent local would exploration for the detection of peritoneal penetration. Wounds with evisceration of omentum and/or bowel were considered as positive peritoneal penetration and explored further during laparotomy.

Table 2: Indications for laparotomy in penetrating abdominal trauma:

Indications	Number of patients	Percentage
Peritoneal penetration of LWE	40	78
Generalized tenderness	17	33
Omental and/or bowelevisceration	20	41
Hemodynamic instability	6	12

All the 40 patients with peritoneal penetration underwent laparotomy. Omental with or without bowel evisceration was present in 41% of cases. Generalized tenderness was present in 17 cases (33%). Hemodynamic instability was present in 12% of cases which was stabilized prior to laparotomy.

Table 3: Plain abdominal roentgenogram findings

X-ray	Number of Patients	Percentage
Normal	48	94.12
Abnormal	3	5.88
Total	51	100

51 cases of penetrating abdominal injuries, plain X-ray abdomen was taken in erect posture. Abnormal findings such as gas under diaphragm, generalized ileus, ground glass appearance, soft tissue abnormalities were noted in 3 cases. In remaining 48 cases X-ray findings were normal.

Table 4: Ratio of operative to conservative treatment

	Number of patients	Percentage
Operated	40	78
Conservative	11	22
Total	51	100

After a detailed clinical evaluation and suitable investigation, 40 patients with peritoneal penetration on local wound exploration, evisceration, those with hemodynamic instability, with peritoneal signs under went exploratory laparotomy. About 11 patients selected for non-operative management because they had no sings of peritoneal penetration or peritoneal signs. None of these required delayed laparotomy after being subjected to serial clinical examination.

Table 5: Role of laparotomy in operated patients

Laparotomy	Number of patients	Percentage
Therapeutic	34	85
Negative	6	15
Total	40	100

Of the 40 patients who underwent exploratory laparotomy, 34 had therapeutic laparotomy. It was negative in 6 cases. All of them were stable injury to anterior abdomen.

Table 6: Role of evisceration of omentum and/or bowel in penetrating abdominal trauma

	Number of patients	Percentage
Evisceration of omentum	16	80
Evisceration of bowel with or without omentum	4	20
Total	20	100

DISCUSSION

Common post-operative complications following penetrating abdominal trauma is respiratory complication. There were total three cases of Intra-abdominal sepsis cases occurred following trauma

involving colon and small bowel. One case developed fecal fistula due to multiple stab injury to abdomen. Wound dehiscence occurred in one case involving small bowel injury and two with colonic injury. Wound infection occurred in cases involving liver laceration colonic and small bowel injuries [5-8].

In the present study (2005-07) majority of patients belonged to the 21-30 years age group followed by those in 10-20 age groups. In Nance FC et al [9] study people in the 21-30 age groups were commonly affected. In Nagy K et al. study majority of patients with penetrating trauma were in 20- 35 year age group. Therefore young and productive age group persons are the usual victims of penetrating trauma.

In the present study, stab injuries constituted the most common cause for penetrating injuries to abdomen accounting nearly 92%. This difference was because the reference study was carried out in an urban centre and possession of guns and fire arms was common in their study population. Most of the cases coming to our hospital included from low socio economic status and from rural areas. The weapons like knife, sickle and axe are common to the population of present study as these are used for household activities and easily available. Also cattle are the part of livelihood being used for ploughing the files and for transportation of goods. This account for the bull bore injury as the second common mode of penetrating abdominal injury.

In the present study the laparotomy was therapeutic in 85 % of cases and in remaining 15% it was negative. In Nance FC et al [9] in 78% of stab injury abdomen the laparotomy was therapeutic. Even in Nagy K et al [10], 78% of all cases required laparotomy for repair of an intra-abdominal injury. As per the data the positive predictive value for omental and/or bowel evisceration in the present study is 0.5. In Leppaniemi AK et al [11] the PPV for omental evisceration is 0.65. This difference is attributed due to nearly 20% of the stab wounds were associated with omental and bowel evisceration in our study.

Omental evisceration indicates peritoneal penetration and in some studies it was associated with serous abdominal injuries in upto 75 % of cases. In another study patients with omental protrusion were managed without operation without any complications. Omental evisceration is probably related more to the size and location of penetrating wound and the omental anatomy in an individual patient than to the presence of significant internal injury. In the present study omental evisceration was present in 80% of cases which correlated well with Nagy K et al [10] where 75% of cases had omental protrusion. Those with evisceration of bowel are commonly associated with internal injuries than those with omental protrusion alone.

In the present study, respiratory complication is the most frequent complication postoperatively accounting upto 28%, second most being intraabdominal sepsis, wound infection and wound dehiscence accounting for 21.3% of them occurred in those with colonic and small bowel injury.

In the present study the duration of stay of patients in the hospital ranged from 3-40 days with an average of 7 days. Mortality rate in the present study is 1.96%, correlates with Nance Fc et al [9] where mortality rate is 1.4%. Hollow viscus injuries are more frequent in patients with penetrating abdominal trauma. In Nance FC et al [9] study liver and small bowel are the commonest organs to be injured. The present study also shows similar findings. The other series of studies [12].

Hence measures taken for the care of patients at the trauma site and establishing well equipped trauma care centres at least at every district hospital will go a long way in preventing morbidity and mortality in these unfortunate victims. Careful and repeated clinical examination and appropriate diagnostic investigations leads to successful treatment in these patients. Majority of the patients require operative intervention particularly those with hemodynamic instability, generalized peritonitis, evisceration of omentum and bowel, and continuing haemorrhage. Peritoneal penetration as such is a poor indication of significant organ injury and requires direct organ specific evaluation, such as computed tomography or laparoscopy to identify patients who can be safely treated without operations [13].

Abdominal roentgenograms are unreliable to predict the intestinal perforation or add to the management in the patients with positive peritoneal signs. Majority of patients who present with evisceration after penetrating wound require a laparotomy. This is true regardless of what has eviscerated or the presence of other clinical indications to operate. Evisceration continues to prompt operative intervention.

CONCLUSION

Liver and small bowel are the commonest organs injured in the present study. Small bowel injuries can be managed by the simple suturing whereas hepatorrhaphy should be done for liver injuries. Mesocolon and mesentery is the third common organ injured in the present study. It can also be managed by simple suturing. Transmural colonic penetrating injuries were treated by colostomy. However primary repair of colon injury can be contemplated depending on the degree of contamination, injury to other organs and hemodynamic stability. Respiratory infection and Intra abdominal sepsis were the frequent postoperative complication in the present study followed by wound infection.

REFERENCES

- [1] Feliciano DV et al Management of traumatic injuries to extrahepatic biliary ducts. Am J surg 1985; 150: 705.
- [2] Lucas CE, Saxe JM, Ledgerwood AM. Liver and biliary tract complications , Mattox LK, editor. Complications of traumas, New YorkL Churchill Livingstone 1994;p. 489.
- [3] Ivatury RR, Nallathambi MN. Colon, In: Evatury RR, Cayten CG, editors. Penetrating trauma. Philadelphia: Williams and wilkins, 1996; pp. 657- 667.
- [4] Flint LM et al. The injured colon. Relationships of management to complications. Ann Surg 1918; 193: 619.
- [5] George SM et al. Primary repair of colon wounds: A prospective trial in nonselected patients. Ann Surg 1989; 209:728.
- [6] Lou Ma et al. Exteriorized repair in the management of colon injuries. Arch Surg1981; 116: 926.
- [7] Thal ER, Yeary EC. Morbidity of colostomy closure following colon trauma. Jtrauma 1980; 20; 287.
- [8] Dawes LG et al. The risk of infection after colon surgery. Surgery 1986;100: 796.
- [9] Nance FC et al. Surgical judgment in the management of penetrating wounds of the abdomen: experience with 2212 cases. Ann Surg 1974; 179: 639-646.
- [10] Nagy K et.al. Evisceration after abdominal stab wounds. Is laparotomy required ?j Trauma 1999;
- [11] Leppaniemi AK, Voutilainen PE, Haapiainen RK, Indications for early mandatorylaparotomy in abdominal stab wounds. Br J Surg 1999 ; 86 ; 76-80.
- [12] Lowe Rj et.al. The negative laparotomy for abdominal trauma. J Trauma 1972 ;12 : 853.
- [13] Dawidson I, Miller E, Litwin MS. Gun Shot wounds of the abdomen. Arch Surg1976 ; 111 ; 862.