



A CLINICAL STUDY OF PENETRATING INJURIES OF ABDOMEN

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ABSTRACT **Background And Objectives:** The incidence of trauma is increasing as a cause of morbidity and mortality. A prospective study of patients presenting with penetrating injuries to the abdomen at Government medical college, Anantapur during June 2023 to Dec 2024 for a period of 18 months above age of 10 years are included. The incidence regarding age sex weapons pattern clinical presentations post operative morbidity and mortality are studied. **Pateints And Methods:** This is a clinical study comprising of 43 patients of penetrating injuries of abdomen who attended casualty in Government general hospital, Anantapur over a period of eighteen months. **Results:** There were total of 43 cases of penetrating abdominal trauma. Penetrating abdominal trauma was most common in the age group 21-40(39%) years with male preponderance (M:F = 9:1). In present study injury pattern showed that 91% of penetrating injuries abdomen are caused by homicidal injuries. Most common presenting symptom is abdominal pain. In my study 17(26.5%) patients had jejunal injuries followed by transverse colon and liver. Most common complication found is surgical site infection 12%, followed by seroma. In present study the mortality rate was 16%. **Interpretation And Conclusion:** The young to middle aged males are most commonly prone to penetrating injuries of abdomen. Most cases are injured by stab with knife. Most common organ is small bowel, followed by transverse colon. Liver is the most common solid organ injured. The most common postoperative complication is surgical site infection.

KEYWORDS :

INTRODUCTION:

Penetrating abdominal trauma is seen in many countries and one of the most common emergencies encountered by a General Surgeon. Trauma, accidental or deliberate, is the most common cause of mortality in adults <40 years of age.¹ The increase in incidence has been explained in various ways thus it may be the price mankind is paying for their increased sophistication of industrialisation and various rapid transport systems.

Abdomen is third in the list of most commonly injured regions in trauma.² Abdominal trauma is usually classified as penetrating and non penetrating trauma, based on whether the integrity of peritoneum has been violated or not. There are various modes of penetrating abdominal trauma such as stab injury, gunshot wounds, animal gore injury and road traffic accidents (RTA).

Primary prevention involves steps taken to reduce racial feelings, ethnic, alcoholism, drug abuse and preventing entry of illegal arms into society whereas death and disability is reduced by definitive management protocols regarding prehospital care, hospital care, rehabilitation and research.

Over the past century, the diagnosis and management of this common problem has changed initially from a more conservative approach to a more operative approach and finally to a selective approach. The organs most commonly involved are Intestine, penetration of peritoneum, Liver, Spleen. Penetrating injuries may lead to peritonitis, Haemorrhage with shock and infection.³ Multiorgan injuries, exsanguinating hemorrhages delayed presentations, and the ominous reputation for high mortality and morbidity are just few of the many reasons which make this topic of penetrating injuries a fascinating one.⁴

Management protocols have been advocated for both solid organ injury and hollow organ injury. Solid organs injury of liver, spleen, renal, pancreas, ureter, are graded on CT findings and proposed management depending grade and severity of injury. Hollow organs like stomach, duodenum, small and large intestine, colon, rectum injuries were also classified with definitive procedure advocated accordingly.^{5,6,7,8,9.}

Patients with peritonitis or hemodynamic instability should undergo urgent laparotomy (LAP) after penetrating injury to the abdomen. Stable patients without peritonitis may be managed without operation.

Indications for immediate LAP include hemodynamic instability, evisceration, peritonitis, or impalement. Selective non-operative management of stable, asymptomatic patients has been demonstrated to be safe.¹⁰

Aims Of The Study:

A prospective study of patients presenting with penetrating injuries to the abdomen at government medical college Anantapur June, 2023 to Dec 2024. Inclusion of all cases penetrating the peritoneal cavity above age of ten years, while those below ten years were excluded.

- 1) Study the general incidence of penetrating injuries to the abdomen, sex incidence, weapons used, and various clinical presentations.
- 2) Study the Patterns of injury that occurs in penetrating injuries
- 3) Methods of evaluation, management and postoperative course with special reference to factors that affect morbidity and mortality.

MATERIALS AND METHODS:

This is a clinical study comprising of 43 patients of penetrating injuries of abdomen less than 10 years of age who attended casualty and treated in Government general hospital, Anantapur over a period of eighteen months from June 2023 to December 2024 were assessed and studied.

OBSERVATIONS AND RESULTS:

Age wise incidence revealed maximum incidence between 21-30 years with 47% incidence compared to Rajendran et al¹⁰ 32.5% followed next by 33% in 31-40 years age group with least incidence in less than 10 years age group. (Table 1).

Table 1:

Age (YEARS)	Present Study (N=43)	Percentage(%)
<10	0	0
11-20	1	2%
21-30	20	47%
31-40	14	33%
41-50	6	14%
51-60	1	2%
>60	1	2%
TOTAL	43	100%

There was a male preponderance with 39 individuals comprising 91%. (Table 2) in comparison to 33 of 40 individuals in Rajendran et al, while Hardik study 11 had 96% were males. Mode of injury was

predominantly Homicidal 39 cases with only 2 cases of suicidal and accidental(**Table 3**) while Hardik (19/2) and Arileppaneimi (120/52).¹²

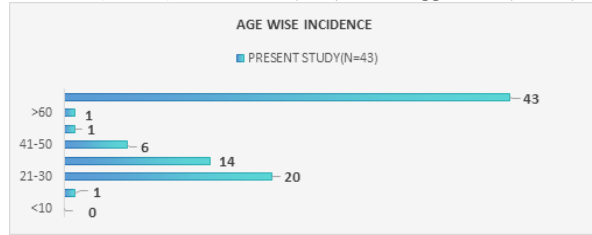


Table 2:

Sex Incidence	Present Study (n=43)	Percentage (%)
MALE	39	91
FEMALE	4	9
TOTAL	43	100



Table 3:

Mode Of Injury	Present Study (n=43)	Percentage (%)
HOMICIDAL	39	91
SUICIDAL	2	4.5
ACCIDENTAL	2	4.5

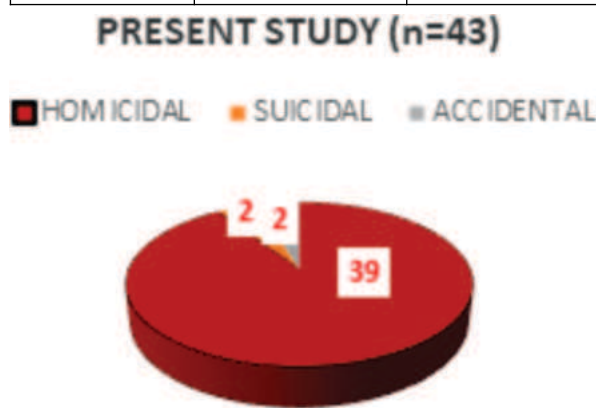
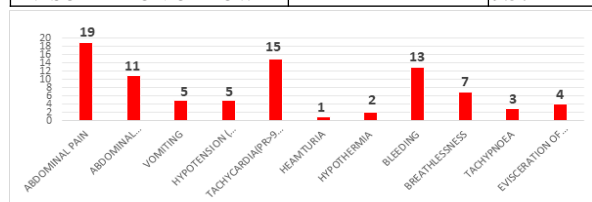


Table 4:

Presenting Symptoms	Present Study(n=43)	Percentage
ABDOMINAL PAIN	19	44.10
ABDOMINAL DISTENSION	11	25.58
VOMITING	5	11.62
HYPOTENSION (SBP≤100)	5	11.62
TACHYCARDIA(PR>90)	15	34.88
HEAMTURIA	1	2.32
HYPOTHERMIA	2	4.65
BLEEDING	13	30.23
BREATHLESSNESS	7	16.27
TACHYPNOEA	3	6.97
EVISCERATION OF BOWEL	4	9.30



Abdominal pain, Tachycardia, and bleeding were predominant presenting symptoms comprising 44%, 34%, 30%, respectively followed by other symptoms. (**Table 4**). Abdominal pain and eviceration were 39 and 4, as compared to 22 and 3 in Hardik study.¹¹

Number of entry wounds was usually one (72%) least being >5 entry wounds in two patients (**Table 5**). Anemia (23%)was the most common major past history followed last by psychiatric problems.(**Table 6**).

Table 5:

Number Of Entry Wounds	Present Study(n=43)	Percentage (%)
1	31	72.09
2-5	10	23.25
>5	2	4.66

NUMBER OF ENTRY WOUNDS (n=43)

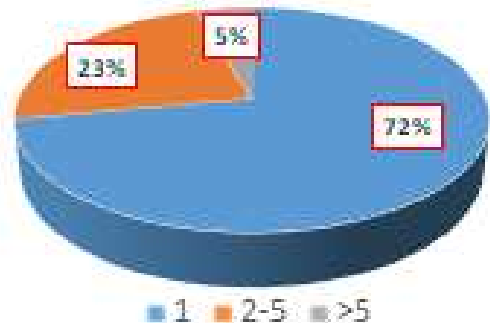
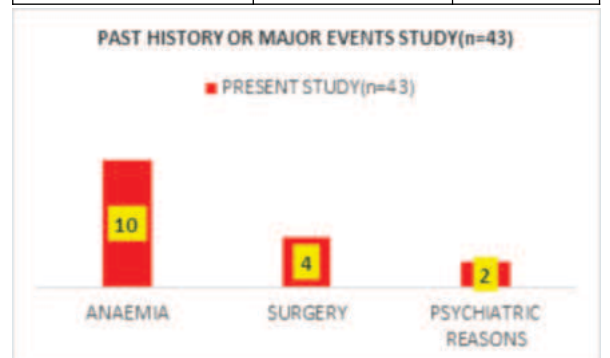


Table 6:

Past History/ Major Events	Present Study (n=43)	Percentage (%)
ANAEMIA	10	23.25
SURGERY	4	9.30
PSYCHIATRIC REASONS	2	4.65



Small bowel (28.3)was most common organ involved followed by mesentery(16.1). Liver, stomach and transverse colon comprised 5 cases each (**Table 7**). Comparing injury to small intestine and large intestine 17 and 7 as compared to 7 and 3 in Hardik while 14 and 6 in Mab siddique study.¹³

Depending on site of injury, in episgatric region liver was coomly involved, jejunum was involved in umblical region, right lumbar and left iliac region, hyposgastric region it was retroperitoneal hematoma, left hypochondrium injured stomach, while right hypochondrium was liver, and kidney was injured commonly in left lumbar region. Ileum or hematoma in right iliac region while lateral chest wall injured lung parenchyma.(**Table 8**)

Table 7:

Organ Involved	Number Of Injuries	Percentage%
DUODENUM	1	1.6
SMALL BOWEL	17	28.3
TRANSVERSE COLON	5	8.0
ASCENDING COLON	1	1.6
LIVER	5	8.0
STOMACH	5	8.0
SPLEEN	2	3.2
PANCREAS	1	1.6

DIAPHRAGM	4	6.4
OMENTUM	3	4.8
DESCENDING COLON	1	1.6
MESENTRY	10	16.1
TRANSVERSE MESOCOLON	5	8.0
SIGMOID MESOCOLON	1	1.6
TOTAL	62	100%

Most common operative finding was jejunal perforation which was treated with primary closure of perforation compared to AnisUzZaman¹⁴. small bowel perforation. This was followed by mesentery tear in 10 cases which was treated with primary repair. Liver and spleen were injured in two cases (Table 9).

The most common morbidity in our study was surgical site infection with 13.6% incidence compared to AnisUzZaman study of 30.6% followed by Seroma and Wound dehiscence. (Table 10).

DIC and shock were the most common cause of death 4 cases (9.3) compared to 6 cases (n=79) in Anis Uz Zaman comprising 7.2%, and others being ventilator associated pneumonia, and septicemia (Table 11).

Maximum hospital stay was 6-10 days with 19 patients falling in this group while 6 patients stayed more than 16 days (Table 12).

Table 8:

STAB INJURY OVER AREA	ORGAN INVOLVED IN DECREASING ORDER
EPIGASTRIC REGION	LIVER > STOMACH > ONLY HEMOPERITONEUM
UMBILICAL REGION	JEJUNUM > TRANSVERSE COLON > OMENTUM > LIVER
HYPOGASTRIC REGION	RETROPERITONEAL HEMATOMA
LEFT HYPOCHONDRUM	STOMACH > JEJUNUM
RIGHT HYPOCHONDRUM	LIVER
LEFT LUMBAR REGION	KIDNEY > URETER > JEJUNUM
RIGHT LUMBAR REGION	JEJUNUM
RIGHT ILIAC REGION	HAEMOPERITONEUM > ILEUM
LEFT ILIAC REGION	JEJUNUM
LATERAL CHEST WALL	LUNG PARENCHYMA

Table 9:

OPERATIVE FINDINGS	NUMBER OF CASES	PROCEDURE DONE
JEJUNAL ILEAL PERFORATION(SINGLE)	15	PRIMARY CLOSURE OF PERFORATION
JEJUNAL/ILEAL PERFORATION(MULTIPLE THROUGH AND THROUGH OR INVOLVING MESENTRY)	2	RESECTION AND ANASTOMOSIS OF AFFECTED SEGMENT
TRANSVERSE COLON PERFORATION MULTIPLE MESENTERIC INVOLVEMENT	5	RESECTION AND ANASTOMOSIS OF AFFECTED SEGMENT
LIVER PARENCHYMAL INJURY	2	CLOSURE (HEPATORRHAPHY) AND ABGEL PACKING
SPLEEN	2	SPLENECTOMY
GASTRIC PERFORATION	5	PRIMARY REPAIR
DIAPHRAGM	4	PRIMARY REPAIR
MESENTRY	10	PRIMARY REPAIR

Table 10:

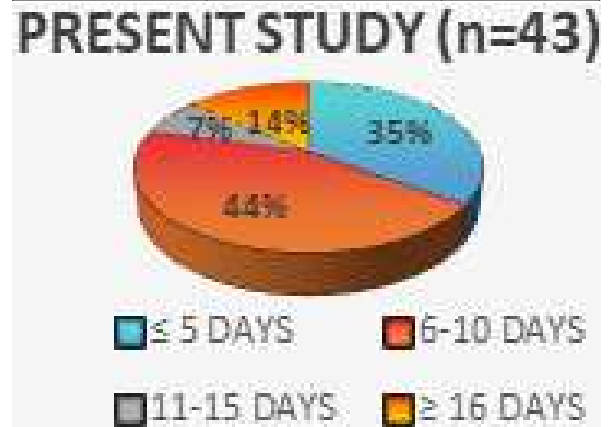
Complication/ Morbidity	Number Of Early Complications In Present Study (n=43)	Number Of Complications In Study By Aniz Zaman (n=79)
Surgical Site Infection(SSI)	6 (13.9%)	24 (30.6%)
Seroma	4 (9.3%)	10 (12.8%)
Dehiscence Of Wound	1 (2.3%)	5 (6.3%)
Pneumonia	4 (9.3%)	-

Table 11:

Cause Of Death	Number Of Deaths In Present Study (n=43)	Number Of Deaths In Study By Anizzaman (n=79)
DIC AND SHOCK	4 (9.3%)	6 (7.2%)
VENTILATOR ASSOCIATED PNEUMONIA	2 (4.6%)	-
SEPTICEMIA	2 (4.6%)	3 (3.9%)

Table 12:

Hospital Stay	Present Study (n=43)	Percentage (%)
≤ 5 DAYS	15	34.9
6-10 DAYS	19	44.2
11-15 DAYS	3	7.0
≥ 16 DAYS	6	13.9



CONCLUSION:

The young to middle aged males are most commonly prone to penetrating injuries of abdomen. Most cases are injured by stab with knife. Most common organ is small bowel, followed by transverse colon. Liver is the most common solid organ injured. The most common postoperative complication is surgical site infection.

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