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ORIGINAL RESEARCH

Patterns and Outcomes of Blunt Trauma Abdomen at a North Indian Tertiary Care Centre

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Abstract

Background: Abdominal trauma is a significant contributor to surgical emergencies, ranking third after head and chest injuries. Blunt trauma is the most common cause of abdominal injury, emphasizing the need for prompt clinical and radiological assessment in patients with blunt traumatic abdominal injuries.The present study was conducted to Investigate patterns of abdominal injuries andto examine the relationships between injury type, mortality, and morbidity

Material and Methods: This study was conducted on patients with blunt abdominal trauma admitted to the Emergency Surgical ward at RajindraHospital under Govt Medical CollegePatiala. A prompt clinical and radiological evaluation was performed. Patients eligible for surgery were identified and intraoperative observations were documented. Postoperative observations were recorded on the 1st, 2nd, 4th, 7th and 10th days following the procedure.

Observations: Findings showed that the small intestine and mesentery were the organs most commonly injured, accounting for 24.3% of cases. This was then followed by injuries to the spleen, liver, large intestine, urinary bladder, kidney, pancreas, duodenum, stomach, diaphragm, and Omentum. Patients with extra-abdominal injuries and those with injuries outside the abdominal region had a higher mortality rate. suffering from damage to multiple organs.

Conclusion: Increased mortality is linked to extra-abdominal injuries, pre-operative shock, and Septicaemia. It is crucial to address these factors promptly. Implementing resuscitative measures, promptly diagnosing the condition, and swiftly performing surgical intervention led to enhanced outcomes.

Key words: Blunt Trauma, Mesentery, Septicaemia

Introduction

Trauma has emerged as a leading cause of morbidity and mortality, driven by rapid industrialization, road traffic accidents, and domestic accidents. Blunt abdominal trauma is the major contributor to high mortality rate.Prior to the industrial era, abdominal injuries were typically caused by penetrating wounds from homicides. However, with the rise of mechanization and automobile accidents, abdominal injuries are now more commonly caused by blunt trauma from accidents.

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Material and Methods

This study was conducted on patients with blunt abdominal trauma admitted to the Emergency Surgical ward at RajindraHospital under Govt Medical College Patiala. The research protocol involved:

1. Initial assessment and stabilization, including vital sign recording and urgent resuscitation.
2. Laboratory tests, including a haematology profile.
3. Radiological investigations, comprising:

- Chest X-ray
- Abdominal X-ray
- Ultrasound

4. A secondary survey to identify potential life-threatening injuries beyond abdominal trauma.
5. A clear indication for surgical intervention was established through either radiological diagnosis or serial physical examinations. Intraoperative findings were meticulously documented in a standardized proforma. Postoperative assessments were conducted on days 1, 2, 4, 7, and 10 to monitor for complications. The patient's progress, any complications, total hospital stay, and mortality outcomes were thoroughly recorded.

Result

This study evaluated 50 patients with blunt abdominal trauma, revealing a demographic profile consistent with previous research. Key findings include:

- A mean age of 32 years, with 71% of patients between 11-40 years old
- A male predominance (94%)

Roadside accidents as the leading cause of blunt abdominal trauma (49% of patients) in this study. Clinical presentations included:

- Abdominal pain (92% of patients)
- Abdominal guarding/rigidity (58% of patients)
- Tenderness (88% of patients)

Notably, some patients (14%) exhibited no abdominal pain or tenderness, yet had positive CT scan results, highlighting the importance of diagnostic imaging[1].In the present study, upon admission, 20% of patients presented with hemorrhagic shock (BP <90 mmHg).Ultrasound findings revealed 41 patients with fluid or solid organ injury while two patients had normal findings. 39 patients with abnormal ultrasound findings underwent laparotomy, confirming intra-abdominal injuries. This yields a 95.12% positive predictive value for ultrasound in detecting abdominal trauma.In the present study, 48% of patients had associated extra-abdominal injuries, with Skeletal injuries being the most frequent (25%), chest injuries occurring in 22% of patients, eye injuries in 5%.The most frequently injured organs in the present study were: liver (26.92%), spleen and small gut each (21.15%), followed by mesentery, large gut, urinary bladder, retroperitoneal hematoma, kidney, pancreas, duodenum, stomach, diaphragm, and Omentum.The liver was found to be the most commonly injured organ in this study, accounting for 26.92% of cases. The spleen and small intestine followed as the second most frequently injured organs. Splenectomy was the primary treatment approach, while small gut injuries typically involved perforation repair

A comparison of the incidence of various organ injuries in other studies is presented in the following figure and table.

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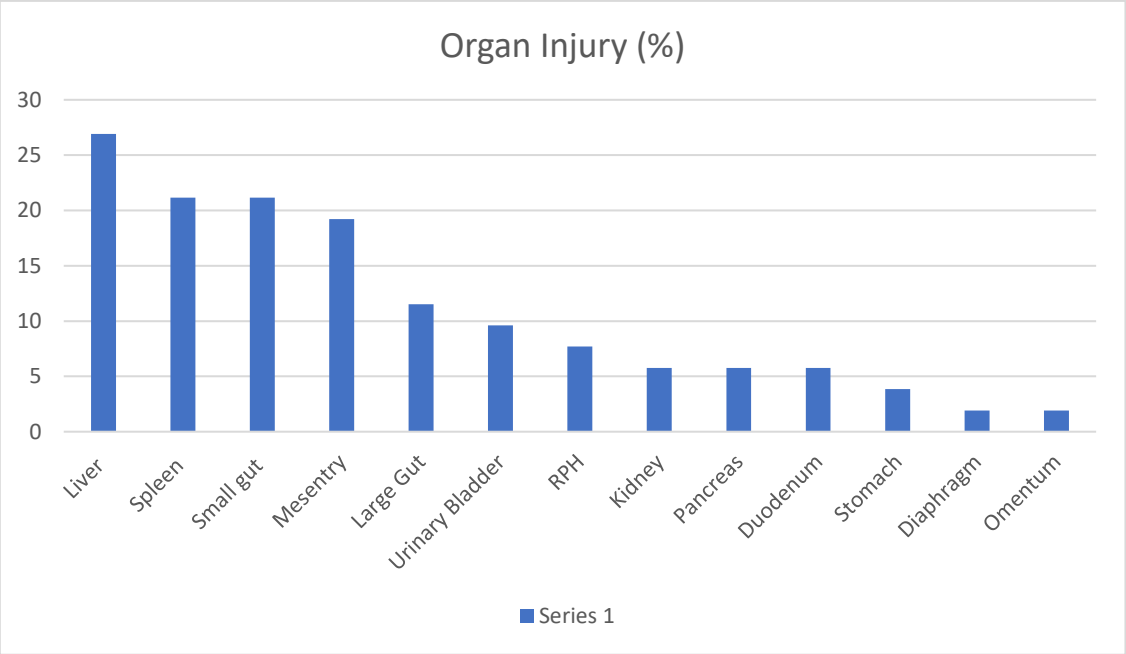
Table: Organ injury and comparative results of studies of Cox, Burch, Sarin and Ramu. Y

	Organ Injured	Our study	Cox	Burch	Sarin	Ramu. Y
1	Spleen	22	42.1	26.2	18.5	34.67
2	Small gut	22	3.44	16.2	18.5	31.33
3	Large gut	12	1.26	_	9.7	_
4	Mesentry	20	13	2.5	15.9	36
5	Liver	28	35.6	15.6	21.2	48
6	Retroperitoneal Hematoma	8	14.5	2.7	20.3	12
7	Kidney	6	2.64	24.2	5.3	13.33
8	Diaphragm	2	5.28	1.1	2.6	-
9	Stomach	4	0.02	1.6	1.7	8.67
10	Pancreas	6	0.02	1.4	2.6	-
11	Duodenum	6	0.05	-	3.5	-
12	Omentum	2	-	-	1.7	6.67
13	Urinary Bladder	10	3.2	-	7	6.67



Discussion

Our study highlights the severity of shock in abdominal injuries, indicating significant internal bleeding or contamination[2].Further studies reveal 14% of patients experienced injuries to multiple abdominal organs[3].As compared to our study Sarin's (1993) study [4], found 21.2% of patients had associated extra-abdominal injuries, with head and chest injuries being the most common.Our study is also comparable to studies of Cox[5], Burch[6] and Ramu. Y[7]. In this study, patients admitted with shock (BP <90mmHg) had a mortality rate of 33%, with two-thirds of these cases attributed to septicemic shock due to fecal peritonitis. This finding aligns with Altemeier and Cole's (1956) observation that all patients developing septic shock succumbed to their injuries[8]. Solanki's 2018 study revealed that 10% of patients presented with shock, of whom 40% did not survive [9], while Tan et al (2011) found a 15% mortality rate in patients with colonic peritonitis [10]. The study also found that mortality was significantly higher in patients with shock at admission (26.7%) compared to those without shock, as reported by Sarin (1993).The mortality rate in this study was 7.3%, which is lower

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than the rates reported by Berqvist et al (1983) [11] (9.1%) and Cox (1984) [12] (16.93%). Roadside accidents accounted for 17.6% of the deaths.The present study found that complication rates were higher among patients with multiple organ injuries (15.3%) compared to those with single organ injuries. Notably, the complication rate increased with the number of organs injured: 2.7% of patients with two organ injuries ,2.7% of patients with three organ injuries , 31% of patients with four or more organ injuries. Similarly, Strauch's (1973) study [13] reported a mortality rate that increased with the number of intra-abdominal organs injured: 12.6% for one organ injured, 20.7% for two organs injured, 31% for three organs injured ,52.7% for four or more organs injured.

Conclusion

Abdominal trauma presents a complex range of challenges. Patients with extra-abdominal injuries, pre-operative shock, and septicemia are at higher risk of complications and death. Prompt resuscitation, early diagnosis, and immediate surgical intervention can help decrease morbidity and mortality in these patients.

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