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Research Paper

A Clinical Study and Follow Up of Blunt Injury Abdomen in the Department of General Surgery

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Abstract
Objectives: *1) To know the etiology and incidence. 2) To study the nature and incidence of injury to different intra abdominal organs. 3) To assess the importance of the various investigations. 4) To study the post operative complications.*
Method: *Out of all the patients with blunt injury abdomen admitted to surgical block 50 cases of blunt injury abdomen were selected by randomisation (closed envelope method). A detailed history as to the mode of injury, thorough clinical examination and necessary investigations like routine investigation, special investigation, ultrasound/ diagnostic paracentesis were performed.*
Results: *Male predominance is seen and age group most commonly involved is 20 to 29 years. The main etiology was road traffic accidents. Pain abdomen (90%) is the most common symptom and generalised tenderness (65%) is the most common sign elicited in the current study. Absent bowel sounds (30%) were also observed. Ultrasound abdomen showed the highest accuracy of 95.7% and the most common investigation patients underwent. Spleen was involved in 40% of cases and involvement of diaphragm was least. Multiple organ involvement was also noticed in 9 patients. Management by surgical method was done in 86%. Wound infections followed by respiratory infection were the complications most commonly encountered in this study. Death is also seen in 25% of patients.*
Conclusion: *The delay in patients of trauma reaching the hospital may be because of lack of an efficient emergency trauma service. With advances in diagnosis and intensive care technologies, most patients of solid visceral injuries with hemodynamic stability can be managed conservatively. All our patients came for followup and were healthy without complications.*

Introduction

Injury or trauma is defined as the damage to the body caused by an exchange with environmental energy that is beyond the body's resilience. Injury is the leading cause of death and diisabiility in the first four decades of life. It has aptly been labeled as the 'neglected disease of modern society' and 'neglected stepchild of modern medicine'. Trauma surgeon is a lynchpin of modern trauma systems.

By convention, injury is classified into several categories- penetrating, blunt, blast over pressure, thermal, chemical and others including crush and barotrauma. Trunkey has pointed out that deaths due to trauma fall broadly into 3 groups giving a

distinct trimodal pattern. 1) immediate deaths (50%) 2) Early deaths (30%) 3) Late deaths(20%)
The past two decades have been a period of increased concern over the improvement of pre hospital emergency care. Of one fourth to one third deaths from trauma could be prevented by more effective initial care. The primary aids like airway management, restoration of circulation, care of cervical spine, cardiopulmonary resuscitation is carried out in the initial stages.

Blunt injury of the abdomen is one of those subjects where the skills of the surgeon is judged both in correct diagnosis of the associated visceral injuries and in treating them. With the increase in the number of motor vehicle accidents, there is rising incidence of blunt trauma The abdomen is the third most commonly injured body region, with injuries requiring operation in about 20% of civilian trauma victims. Blunt injury continues to be the most common mechanism of injury to the abdomen. Blunt trauma carries a high mortality compared to penetrating trauma.

The main objective of the current study is to know the etiology and incidence, the nature of injury to different intra abdominal organs. And also to assess the importance of the various investigations along with the post operative complications

Patients and Methods

Out of all the patients with blunt injury abdomen admitted to surgical block in Department of General Surgery in Government General Hospital attached to Rangaraya Medical College, Kakinada, 50 cases of blunt injury abdomen were selected by randomisation (closed envelope method) From July 2013 to August 2015.

All patients with blunt injury abdomen admitted and operated in various surgical units were included in the study, where as patients with penetrating injury of abdomen and Injury to external genitalia were excluded. A detail history as to the mode of injury, thorough clinical examination and necessary investigations like routine investigation, special investigation, ultrasound/diagnostic paracentesis were performed. The management was individualised and each case was assessed separately. In patients where laprotomy was performed after resuscitation, the details regarding the visceral injury and nature of surgery performed were recorded. Each case was carefully followed up to evaluate the progress of patient and to note the development of complications, if any and its management. Patients were followed at intervals of 1 week, 1month and 3 months after discharge .Except for nonspecific abdominal pain there were no complications in the followup period

Results

In this study, 50 cases of blunt injury abdomen who were admitted and treated at government general hospital, Kakinada during July 2013 to August 2015 were included. Out of 50 patients involved in the study 90% were male and 10% were female showing male predominance and maximum number of the patients (30%) were in the age group of 20-29 years. The leading cause of blunt abdominal injuries in the current study was the road traffic accidents (60%). Pain abdomen (90%) followed by vomiting, distension, and retention of urine are the symptoms with which the patients were presented. On eliciting generalized tenderness (63%), guarding/ rigidity (52%) were the predominant signs. Absent bowel sounds (30%) were also observed. 94% of patients underwent ultrasound abdomen investigation followed by Diagnostic paracentesis (54%) and Erect X-ray abdomen (40%)Out of which ultrasound abdomen showed an accuracy of 95.7% followed by diagnostic paracentesis (88.8%) and erect x-ray abdomen (85%).

Spleen is the most commonly involved organ in the blunt injury followed by liver, mesentry and small intestine where as stomach, duodenum, retroperitoneal hematoma and diaphragm are least involved.

Multiple organ injuries were noted in 9 patients out of which 8% involved both small intestine and mesentry, followed by spleen and liver injury. Out of the 50 patients involved in the study 86% of

patients were surgically treated and only 14% were managed conservatively. 58.33% of liver injury patients were managed conservatively. 70% of spleen injury patients underwent spleenectomy. 30.76% of bowel injury patients underwent resection and end to end anastomosis

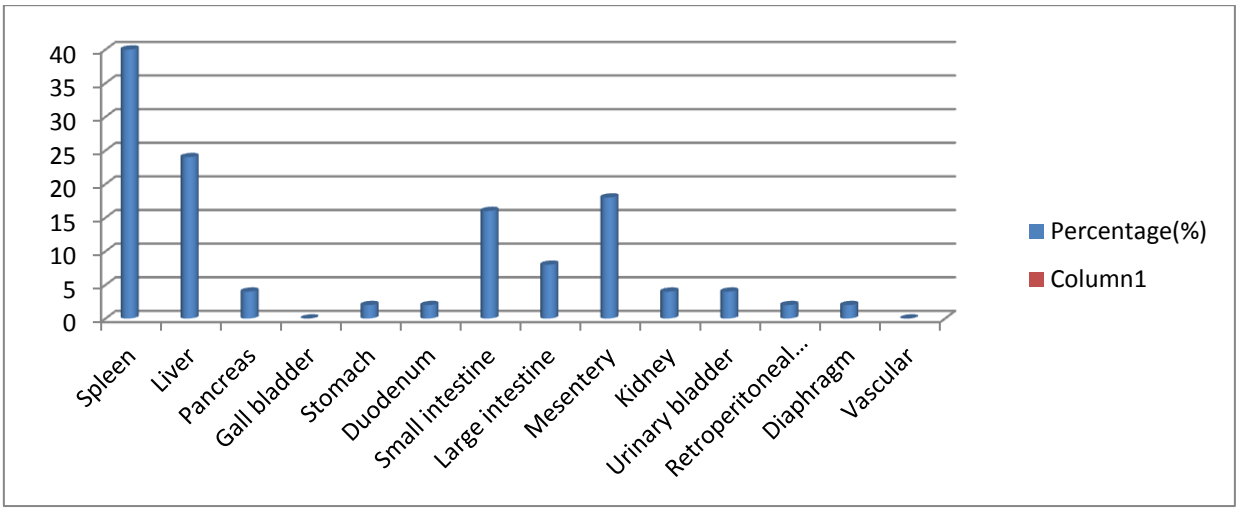

Fig 1: Graph showing the percentage of visceral injury

The most frequently observed complication was wound infection (31.25%) followed by respiratory infection (18.75%) and wound dehiscence (12.5%). Death was also observed in 25% of patients.

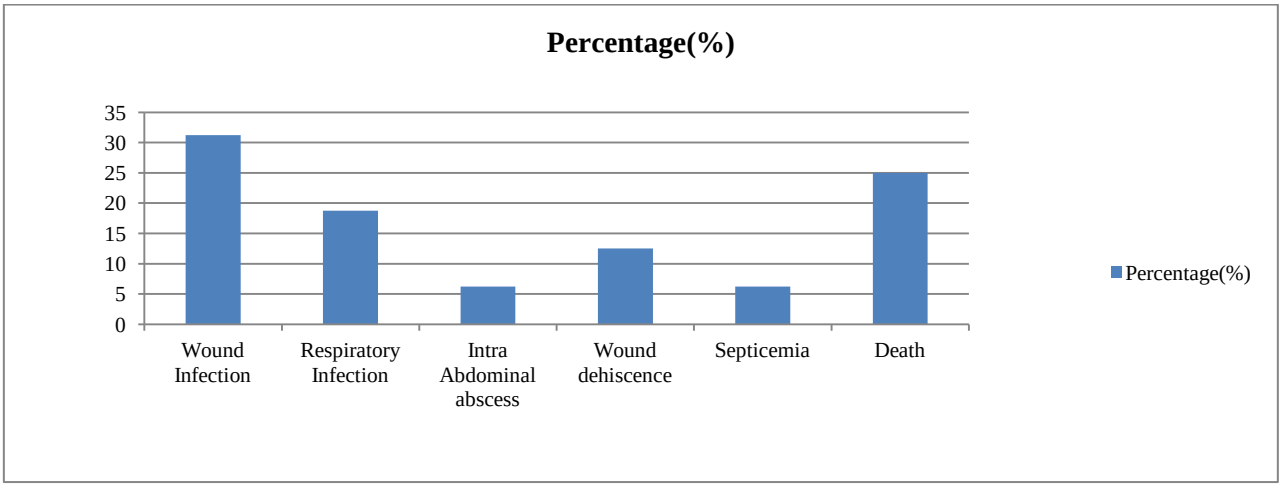

Fig 2 : Graph showing the percentages of complications

Discussion

In this study, fifty cases of blunt abdominal injuries who were admitted at Government General. Hospital, Kakinada during July 2013 to August 2015, were included and studied. Presently available literature on abdominal injuries is reviewed and the results of our study are compared with those of well known authors.

In the studies by E. James Frich Jr. et al, the age group which had maximum number of patients belonged to the age group of 20 to 29 years. In a study by Bolton and Wood, two thirds of patients were from 2nd and 3rd decade. In the present study it is 54% of cases. In the study by Frederick A. Morre et al in University of Texas, Houston Medical School, the mean age was 27.2 years. The studies by Wilson R. H.97 showed a lower peak age incidence of 15 to 24 years.

In current study, 45 (90%) were males and 5 (10%) were females; male to female ratio was 9:1

which depicts male predominance. Other studies also have shown male predominance like those by Davis' Fitzgerald and Wilson

Road traffic accident was the most common cause in the study by Wilson et *al* (70%) and in the study by E. James Frick et al (78.6%). In a study by Brad M. Cushing et al, Department of Traumatology at R. Adams Cowly, Shock Centre, Maryland, Baltimore, 56.5% of abdominal injuries were due to motor vehicle and motor cycle crashes and 12.1% of cases were because of assault. In the study by Ray Jade Chen etal , 49% of the blunt injury abdomen was caused by motor vehicle accidents. In current study, commonest organ involved was spleen (40%), followed by liver (24%). In the study done at R. Adam Cowley Shock Trauma Centre, spleen was the commonest organ involved (41.1%), followed by liver (37%). E.James Frick Jr. reported 42% incidence of small bowel and mesenteric injuries without any other associated injuries.

Accuracy rate of ultrasound abdomen in blunt injury in current study was 96.7%. In a study by Richard K. Simons et al, division of trauma, Department of Radiology, San Diego Medical rentre. California, ultrasound abdomen in blunt trauma had an accuracy rate of 97.1%.In another study by Mark McKenney et al. University of Miami, they found an accuracy rate of 97% for Ultrasound in detecting intra abdominal injuries.In a study by Yashi et al at Saiseikei Kanagawaken Hospital, Yokohama, Japan, ultrasound abdomen had an accuracy rate of 95.7%. Hence they concluded that ultrasound is reliable for the detection of solid organ injuries, despite its poor sensitivity for intestinal injuries. In our study 60% of the patients had only isolated abdominal injuries; another 18% had associated extremities and axial skeleton injuries

Figure 3 : Organs Involved in Blunt Injury Abdomen (Comparative Study)

Visceral Injury	**Present Study**	**G.Tom Shiren**	**Waif and Criflea** 307 **Cases**	**Houston Medical School, Texas University**	**Saisekei Kanagawaken Hospital, Yokohama, Japan**	**Hamilton Bebson** 23 **Cases**
Spleen	40%	26.2%	21.9%	31.7%	25.7%	43.7%
Liver	24%	15.6%	13.7%	32.4%	13.0%	26.0%
Kidney	4%	24.2%	4.1%	11.5%	10.3%	8.7%
Small intestine	16%	16.2%	15.2%	20.1%	19.0%	8.7%
Retroperitoneal Hematoma	2%	2.7%	14.7%	-	-	-
Mesentery	18%	2.5%	8.2%	-	8.0%	13.0%
Urinary bladder	4.0%	6.5%	8.7%	-	8.0%	-
Stomach	2%	-	1.2%	-	-	-
Pancreas	4.0%	1.4%	6.8%	12.2%	4.0%	-
Diaphragm	1%	1.1%	1.7%	-	12.0%	-
Gall bladder	-	-	-	-	-	-

In the study done at R. Adam Cowley Shock Trauma Centre, 40% of patients had associated pulmonary contusion, 33.3% had lower rib fracture, fracture femur in 13.3% and pelvic fracture in 26.7% cases. Mortality of 8% (4 out of 50 patients expired) were seen in the current study .The mortality was high. Reason might be patient reaching the hospital late, delay in diagnosis and surgery and high incidence of post operative wound infection in our setup.

Conclusion

Road traffic accident is the commonest cause of injury. The delay in patients of trauma reaching the hospital may be because of lack of an efficient emergency trauma service. Thorough clinical examination, diagnostic paracentesis, plain X-ray erect abdomen and ultrasound proved to be very helpful in the diagnosis of intra abdominal injuries. With advances in diagnosis and intensive care technologies, most patients of solid visceral

injuries with hemodynamic stability can be managed conservatively.

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