

# A Study of Pattern and Management of Blunt and Penetrating Abdominal Trauma

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## ABSTRACT

**Objective:** To study the pattern and management of both blunt and penetrating abdominal trauma as regard to postoperative morbidity and mortality.

**Design:** It was a retrospective analysis.

**Materials and Method:** This study was carried out from 2001 to 2002 in the Accident & Emergency Department, Lahore General Hospital, comprising of 100 patients.

**Results:** One hundred patients aged >12 years with abdominal trauma were included in the study. The patients below 12 years of age and those who expired during resuscitation were excluded from the study. Out of one hundred patients, 88 were males and 12 were females with Mean±SD age of 26.0±8.5 years. The age ranged from 12 to 60 years. The commonest mechanism of injury in penetrating abdominal trauma was firearm. The less common mode of injury was impalement in 2 patients. In the blunt abdominal trauma, road traffic accident was the most common mode of injury. Thus sixty five patients had penetrating abdominal trauma and thirty patients were injured by blunt abdominal trauma. The mortality in this study was 1%.

**Conclusion:** It is concluded that management of abdominal injuries are good, applicable and cost effective with minimum morbidity and mortality.

**Key words:** Blunt, Penetrating, Abdominal trauma, Mortality, Morbidity

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## INTRODUCTION

In an age of speed, civil violence, armed conflicts, crimes of passion and traffic accidents, the incidence of penetrating and blunt injuries to the abdomen has been on the increase. Although, the morbidity and mortality from these injuries are gradually decreasing, abdominal injuries still pose a formidable problem, especially in young adults, not only in terms of hemorrhage and infection but also regarding early diagnosis.<sup>1</sup> Abdominal trauma is a source of significant mortality, and morbidity with both penetrating and blunt mechanisms of injury. In many third world countries particularly in Asia, information is limited and the impact of trauma is poorly understood. Among the injuries that require surgery after civilian trauma, approximately 20% occur in the abdomen. Abdominal injuries account for 13-15% of trauma deaths, primarily due to haemorrhage. Blunt abdominal trauma usually occurs in association with multisystem injury, making the diagnosis complex and challenging.<sup>2,3</sup>

Trauma is the leading cause of morbidity and mortality in the world. Following the head and extremities, the abdomen is the third most commonly injured anatomic region. Abdominal trauma can be

associated with significant morbidity and may have a mortality rate as high as 8.5%. The abdomen is the most common site of initially unrecognized fatal injury in traumatized patients.<sup>4</sup> Injured abdomen is relatively common among both civil and military casualties and remains a major source of morbidity and mortality especially when there is delay in diagnosis or treatment.<sup>5-7</sup> In developing countries, however, late arrival to hospital, poor diagnostic facilities as well as late intervention continue to adversely effect the outcome. We report the experience in the management of these patients at the Lahore General Hospital, before the arrival of computed tomography (CT) scan.

## PATIENTS AND METHODS

This prospective study of 100 patients with abdominal trauma who presented in the Accident and Emergency Department of Lahore General Hospital which is a teaching hospital attached with Postgraduate Medical Institute, Lahore during 2001 to 2002. Patients above 12 years of age, either sex with abdominal trauma, penetrating wounds of the abdomen from the chest below the 5<sup>th</sup> intercostal space to symphysis pubis anteriorly were included. Patients below 12 years of age of either sex, who expired during resuscitation or at the operation table and minor injuries e.g. superficial stab wounds, cases

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admitted for toilet and suture were excluded from the study. Patients with abdominal trauma were assessed and managed according to hemodynamic status and kept under observation for 48 hours. Different organ injuries were managed according to their extent and severity. Peritoneal irrigation was performed in all cases using normal saline until the effluent was clear. For ligation, 1 or 2/0 silk and 1 or 2/0 chronic catgut were used, while for anastomosis of gut, 2/0 or 3/0 vicryl was used. The closure of abdomen was performed en-mass with No.1 prolene by running suture. Postoperatively, when the wound infection was confirmed by the presence of pus or turbid fluid from wound, a few or all stitches were removed. The chest infection and urinary tract infection were diagnosed by chest X-ray and urine examination respectively.

**RESULTS**

Out of one hundred patients, 88 (88%) were males and 12 (12%) were females with mean±SD age of 26.0±8.5 years. The age ranged from 12 to 60 years. The commonest age group was 21-30 years in males and 12-20 years in females (Table 1).

Table 1: Age and Sex distribution (n = 100)

Age (years)	Males (n = 88)		Females (n = 12)	
	=n	%age	=n	%age
12 – 20	26	26.0	6	6.0
21 – 30	37	37.0	2	2.0
31 – 40	19	19.0	3	3.0
41 – 50	5	5.0	-	-
51 – 60	1	1.0	1	1.0

Table 2: Mechanism of injury (n = 100)

Mode of injury	=n	%age
<b>Penetrating</b>		
Firearm	49	49.0
High velocity	13	26.5
Low velocity	22	44.9
Shotgun	14	28.6
Stab	14	14.0
Impalement (ice pick)	2	2.0
<b>Blunt</b>		
Road traffic accident	26	26.0
Fall from height	5	5.0
Blows	4	4.0

Table 3: Mortality status among total patients (n = 100)

Mode of injury	=n	%age	Cause of death
Blunt trauma to left upper abdomen by bumper of tractor	1	1.0	Septicemia high outpatient pancreatic fistula

Commonest mechanism of injury in penetrating abdominal trauma was firearm. In this group, there were 49 patients (49%). Among 49 patients, 13 (26.53%) were injured by high velocity gunshot, 22

patients (44.9%) with low velocity gunshot and 14 patients (28.57%) with shotgun weapon. Patients with stab injury to abdomen were 14(14%). The less common mode of injury was impalement in 2 patients (2%). In the blunt abdominal trauma, road traffic accident was the most common mode of injury. It had 26 patients (26%). Fall from height and blows to abdomen were the less common mechanism of trauma and they consisted of 5 patients (5%) and 4 patients (4%) respectively. Thus sixty five patients had penetrating abdominal trauma and thirty patients were injured by blunt abdominal trauma (Table 2). Mortality in this study was 1%. Patient who died was 40 years old (Table 3).

**DISCUSSION**

In this prospective study, the predominance of young males has been observed as they are the more mobile population of the society. Male to female ratio was found to be 8:1 might be due to the socio-cultural pattern of our country like many other countries which have a traditional pattern of family and the majority of women spend most of their time at home. Similar report is present in case of trauma victims, the male to female ratio which was 7.33<sup>8,9</sup>. Mean age of patients was less than 30 years of the present study which is similar to other parts of the world 229 (88%) patients sustained blunt trauma and 55 (19%) sustained penetrating injuries, which shows that the ratio of blunt to penetrating abdominal trauma is significantly higher from other parts of the world.<sup>10,11</sup> In penetrating abdominal trauma, low velocity firearm abdominal wounds are more common in civil as compared to high velocity<sup>12</sup>. This is proved by present study as well by studies of Muckart et al<sup>13</sup> in 1990 and Shrestha in 1995<sup>14</sup>. Firearm to abdomen was the most common mechanism of injury in the present study. This is similar to the study of Khan et al in 1995.<sup>15</sup> Most common mode of blunt trauma to abdomen in our study was road traffic accidents (26%). It was followed by fall from height (5%) and blows to abdomen were 4%. According to Wiener and Barrett<sup>12</sup> in civilians, blunt trauma is caused primarily by road traffic accidents (14%) and falls (10%). Similarly in other studies road traffic accident is also commonest mechanism of injury as compared to falls and blows to abdomen.<sup>16,17</sup> In our study, mortality rate was 1%. It is much less when the literature on abdominal trauma was reviewed. In another studies, Gao and associates<sup>18</sup> reported mortality rate of 11.8%, Bonariol et al<sup>19</sup> reported a mortality rate of 15% and Vatanaprasan<sup>20</sup> reported a mortality of 12.1%. They say that delay in diagnosed and undetected injuries are a preventable cause of increased morbidity and mortality.

## CONCLUSION

Penetrating injury is more common than blunt. Gunshot injuries to abdomen are at the top most level as regards to the mode of injury. The highest number of injuries in small intestine, but the spleen is the most commonly damaged solid discus in blunt trauma.

## REFERENCES

1. Thompson JS, Moore EE, van-Duzer-Moore S, Moore JB, Galloway AC. The evolution of abdominal stab wound management. *J Trauma* 1980; 20: 478-84.
2. Jansen JO, Yule SR, Loudon MA. Investigation of blunt abdominal trauma. *BMJ* 2008; 336: 938-42.
3. Wyatt J, Illingworth RN, Graham CA, Clancy MJ, Robertson CE. *Oxford handbook of emergency medicine*. Oxford: Oxford University Press; 2006; 346-60.
4. Cigdem MK, Onen A, Siga M, Otcu S. Selective nonoperative management of penetrating abdominal injuries in children. *J Trauma* 2009; 67: 1284-6.
5. Cox FE. Blunt abdominal trauma: A 5- years analysis of 870 patients. *Ann Surg* 1983; 190: 467-74.
6. Odelalo EO. Pattern of pedestrian injuries from road traffic accidents in Nigeria. *W Afr Med J* 1992; 11: 130-4.
7. Adekunle OO. Abdominal trauma in Ibadan, Nigeria. *Nig Med J* 1980; 10: 131-6.
8. Zargar M, Modaghegh MHS, Ardalan KM, Noparast M. Abdominal trauma: a study on 287 patients. *MJIH* 2003; 6: 9-12
9. Balt SK, Croley GG. Blunt abdominal trauma: a review of 637 patients. *J Miss State Med Assoc* 1996; 37: 465-8.
10. Wilson RF, Walt AJ. General considerations in abdominal trauma. In Wilson RF, Walt AJ, eds. *Management of trauma pitfalls and practice*. 2<sup>nd</sup> ed. Philadelphia: Williams and Wilkins, 1996; 412-40.
11. Udoeyop UW, Iwatt AR. Abdominal trauma in southeast Nigria. *Afr J Med* 1991; 37: 409-15.
12. Wiener SL, Barrett J. *Trauma management for civilian and military physician*. London: WB Saunders Co., 1986
13. Muckart DJJ, Abdool-Carrim ATO, King B. Selective conservative management of abdominal gunshot wounds: a prospective study. *Br J Surg* 1990; 77: 652-7.
14. Shrestha R. *The management of firearm injuries of the abdomen [Thesis]*. Lahore: University of he Punjab, 1995.
15. Khan AFA, Javeed K, Zaidi SNR. Penetrating abdominal trauma. *Pak J Surg* 1995; 11: 83-7.
16. Najfi SM, Khan AFA, Gondal KM. Spectrum of injuries in blunt abdominal trauma at Mayo Hospital, Lahore. *Biomedica* 1995; 11: 18-22.
17. Ghazanfar A, Chaudhry ZA, Zubair M, Nasir SM, Khan SA, Ahmad W. Abdominal solid visceral injuries in blunt abdominal trauma: an experience in busy surgical unit of Mayo Hospital, Lahore. *Ann KEMC* 2001; 7: 85-7.
18. Gao JM, Du DY, Zhao XJ, Liu GL, Yang J, Zhao SH, et al. Liver trauma: experience in 348 cases. *World J Surg* 2003; 27: 703-8.
19. Bonariol L, Massani M, Carztozozolo E, Recordare A, Callegari P, Antoniutti M, et al. Selection criteria for non-surgical treatment of liver injury in adult poly traumatized patients. *Chir Ital* 2002; 54: 621-8.
20. Vatanaprasan T. Operative treatment of hepatic trauma in Vachira Phuket hospital. *J Med Assoc Thai* 2005; 88: 318-28.