

## Original Research Paper

# Abdominal Organ Involvement in Blunt Injuries

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### Abstract

Visceral injuries of the abdomen following blunt trauma present a great medico-legal problem to the forensic experts. Thus the doctor should remain alert to the development of signs and symptom after blunt trauma to the abdomen in vehicular accident otherwise he may be charged of negligence. Among 55 fatal cases of blunt abdominal injury, maximum number of cases belongs to the age group 20-29 yrs. Males were the predominant victims with ratio 4:1. It was found that road traffic accidents by heavy vehicle like bus; car and truck were responsible for 70% of blunt abdominal injuries. Among 55 cases of blunt injury, the incidence of the involvement of liver, spleen, small intestine, kidney, stomach and urinary bladder were 67%, 30.91%, 18%, 10.9%, 9.09%, 5% cases respectively. Genitals were found injured in 3% cases of blunt injury abdomen. For Blunt Injuries of Abdomen majority of the cases i.e. 78.18% were of accidental, 18.18% were homicidal and 3.6% suicidal in nature. Immediate cause of death was shock and hemorrhage and in those cases where death was delayed, cause of death was septicemia.

**Key Words:** Blunt Injuries, Vehicular Accident, Visceral Injuries

### Introduction:

Visceral injuries following blunt trauma present a great medico-legal problem to the forensic experts. Medico-legal problems increases more when there are visceral injuries in absence of any evidence of external mark by blunt trauma.

Abdomen is considered as a magic box both by the surgeons as well as the physicians. Sometimes exact injury is diagnosed only when abdomen is opened either during operation by the surgeon or during autopsy by the autopsy surgeon.

Sometimes there may not be any external injury still patient had died of intra-abdominal hemorrhage. On the other hand the treating doctor should also be remain alert to the development of clinical features regarding after blunt trauma to the abdomen after vehicular accident to avoid charged of negligence upon them.

In this study the epidemiological, medico-legal and clinic-pathological aspects of blunt abdominal injuries are studied in the cases that were brought to the mortuary of Chhatrapati Shahu ji Maharaj Medical University, UP, Lucknow.

### Material and Methods:

The materials for the present study were the 55 fatal cases from all age group and both sex having history of blunt injuries of the abdomen sent by police for medico-legal autopsy to the mortuary of C.S.M Medical University, Lucknow in 2007-08 were studied. Decomposed bodies were not considered in the study. Only those cases taken into consideration in which cause of death is clear, certain & exclusively due to blunt trauma abdomen.

### Results:

The age of the victims in present study varied from 1-70 years. The peak incidence was observed in the age group of 20-29 years comprising 38.18% of cases. It was also observed that 29.09% belonged to the age group 30-39 years. So the highest number of cases due to blunt force injuries to the abdomen occurred in second to fourth decade. (Table-1) Individuals related to extreme of the age group were least affected i.e. 50-70 years & 0-9 years. Males comprised a majority and constituted 78.18% compared to females who were only 21.82%.

Largest number of cases was due to crushing by heavy motor vehicles, next were

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due to direct impact by some blunt object and fall from height. (Table-2) Out of 55 cases of Blunt injury abdomen, 92.73% cases had visible signs of external injury either on anterior and posterior aspect of abdomen or both. On the other hand in 7.27% cases did not show any sign of external injuries on the abdomen, but there was underlying fatal visceral injuries.

Out of 55 cases, 3.64% cases were suicidal, 18.18% cases were homicidal and rest 78.18% was accidental in nature and hence the accidental cases were most common among blunt injury abdomen.

Out of 55 cases, liver was found injured in 67.27% cases, spleen in 30.91% cases, small intestine in 18.18% cases, kidney in 18.18% cases, stomach in 9.09% cases, urinary bladder in 5.45% cases, gallbladder in 7.27% cases and pancreas in 5.45% cases and genitals in 3.64% cases. Hence liver is the most common injured organ in Blunt injury abdomen. Next one is spleen then small intestine and stomach. Genitals were found injured only in 3.64% cases, and in all cases cause being motor vehicle accident.

### Discussion:

As shown in table 1, most common age group affected in this series was between 20-29 yrs. It was consistent with the findings of Kuloski, [1] Asogwa, [2] Chandra et al. [3] The second most common age group was between 30 – 39 years of age. It was also consistent with the observations of the previous authors. Persons below 10 years of age contribute very less (3.75%) while in the study of Chandra et al [3] (1979) the incidence was 11.39%. This reduction in children fatalities could be due to better treatment, better education and more attention by parents.

As shown in table 2 maximum number of cases of blunt injuries of abdomen was due to crushing by motor vehicles. Next higher were due to direct impact of blunt object as Lathi. Very few cases were due to fall from height and one case was due to fall of roof wall. Gorden Turner and price [4], Keith Simpson and Modi [5] were of same opinion, that accidental crush injuries due to motor vehicles were more common. In 55 cases of blunt injuries of abdomen, external injuries were present on anterior aspect in 87.27% cases and on posterior aspect in 5.45% cases. According to Modi, there is no definite pattern of blunt injuries of abdomen. They do not tell whether the blunt injuries are inflicted more on anterior or posterior aspect. In 7.27% cases, no external injuries were found but there were fatal visceral injuries.

Modi have the same opinion that in some cases there is no external abdominal injury, even that there is deep seated visceral injuries of abdomen.

Out of 55 cases, 3.64% cases were suicidal, 18.18% cases were homicidal and rests 78.18% were accidental and hence the accidental cases were most common among blunt injury of abdomen. According to Modi and other foreign writers, accidental cause of blunt injuries of abdomen was most common, that was also found in present study.

As shown in Table 3, Liver was commonest organ injured in 67% cases. Out of 37 cases, 26 cases were due to injury by motor vehicles, four cases due to fall from height, 6 cases due to direct blow on abdomen by lathi, hockey etc., one case was due to fall of roof upon the deceased. Tonge et al [6] had reported 24.9% incidence of liver injury in fatal road accidents. Kaur [7] study showed liver injuries in 16.55% cases of motor cyclists.

As shown in Table 4, splenic injury was found in 30.91% cases. Tonge et al [6] reported splenic injury in 21% of cases. Another observation derived in the present series shows out of 17 cases, 13 cases were due to injury by motor vehicles, one case due to fall from height and three cases due to direct blow by some blunt object.

As shown in table 5, Injury to intestine was found in 18% cases. This incidence was 6.2% in the observation of Tonge et al. [22] All 10 cases were due to injury by motor vehicles.

As shown in table 6, Kidney was found injured in 10.91% cases. Out of 6 cases, 4 cases were due to injury by motor vehicles and 2 cases due to direct blow by some blunt object. It is consistent with the findings of Kaur [7] in which she reported that kidney injury was found more commonly in fatal heavy motor vehicular and two wheeler accidents.

As shown in table 7, stomach was found injured in 9.09%. All cases were injured due to motor vehicles. Tonge et al [6] reported the incidence of 0.8% while Bruce et al (1965) reported stomach injury in 2% of cases.

Urinary bladder was found injured in 5% cases. All cases were injured due to injury by motor vehicles. Incidence of urinary Bladder injury reported by Tonge et al [6] was 4.9%. Kaur [7] in her study of fatal auto vehicular two wheeler accidents reported incidence of 1.37%.

Gall Bladder was found injured in 7.27% cases and pancreas was found injured in 3.45% cases. The incidence of gall bladder & pancreatic injury reported by Tonge et al [6] was 1.7%; the similar explanation had been given by Orr. [8]

**Conclusion:**

- Crushing by heavy motor vehicles is the most common mode (70%) of blunt trauma abdomen.
- Majority of victims were young adult males between 20-39 years of age group.
- In majority of cases (92.7%) of blunt abdominal injuries have signs of external abdominal injuries, but in very few cases (7.2%) does not show any external signs of abdominal injuries, but there is deep seated fatal visceral injuries.
- Liver is the most commonly organ involved in blunt injuries of abdomen followed by spleen, small intestine, kidney, stomach, gall bladder, urinary bladder and pancreas in decreasing order respectively.
- In most of the cases, involvement of more than one viscera is reported.
- Most of the cases of blunt abdominal injuries were accidental in nature, very few are homicidal and suicidal in nature.
- Most common cause of death was shock and haemorrhage, especially when the person dies within few hours. In those cases where death was delayed, cause of death was septicaemia.

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**Table 1: Age & Sex of the Victims**

Age Groups (in Yrs)	Male		Female		Total	
	No.	%	No.	%	No.	%
0 – 9	3	5.45	0	0	3	5.45
10 – 19	6	10.91	1	1.82	7	12.73
20 – 29	14	25.45	7	12.73	21	38.18
30 – 39	13	23.64	3	5.45	16	29.09
40 – 49	5	9.09	1	1.82	6	10.91
50 – 59	1	1.82	0	0	1	1.82
60 – 69	1	1.82	0	0	1	1.82
70 – 79	0	0	0	0	0	0
80 – 89	0	0	0	0	0	0

**Table 2: Mode of Injuries Inflicted**

Modes of blunt injuries of abdomen		Cases (%)
(a)	By motor car, bus, truck	39(70.91)
(b)	By crushing in crowd, or injured heavy object e.g. fall of roof wall	1(1.82)
(c)	By fall from height	5(9.09)
(d)	By direct impact of Blunt object eg. Lathi/ Hockey/Kick	10(18.18)
<b>Total</b>		<b>55(100)</b>

**Table 3: Blunt injuries of Liver**

Internal Organs		Cases (%)
(a)	Liver	22 (59.46)
(b)	Liver + Stomach	1(2.70)
(c)	Liver + Gall Bladder	2 (5.41)
(d)	Liver + Kidney	2 (5.41)
(e)	Liver + Spleen	3(8.11)
(f)	Liver + Small intestine + Spleen + Stomach	1(2.70)
(g)	Liver + Small intestine + Kidney + Spleen	1(2.70)
(h)	Liver + Small intestine + Spleen + Pancreas	1(2.70)
(i)	Liver + Small intestine + Spleen + Gall Bladder	2(5.41)
(j)	Liver + Small intestine + Stomach + Genitals	1(2.70)
(k)	Liver + Small intestine + Large intestine + Spleen + Genitals + Gall Bladder	1(2.70)
<b>Total</b>		<b>37(100)</b>

**Table 4: Blunt injuries of Spleen**

Internal Organ		Cases (%)
(a)	Spleen	7 (41.18)
(b)	Spleen and liver	3(17.65)
(c)	Spleen + Kidney + Pancreas	1(5.88)
(d)	Spleen + Liver + Small intestine + Stomach	1(5.88)
(e)	Spleen + Liver + Small intestine + Kidney	1(5.88)
(f)	Spleen + Liver + Small intestine + Pancreas	1(5.88)
(g)	Spleen + Liver + Small intestine + Gall Bladder	2(11.77)
(h)	Spleen + Small intestine + Liver + Genitals + Gall Bladder	1(5.88)
<b>Total</b>		<b>17(100)</b>

**Table 5: Blunt injuries of Small Intestine**

Internal Organs		Cases (%)
(a)	Small intestine	1(10.00)
(b)	Small intestine and Pancreas	2(20.00)
(c)	Small intestine + Large intestine + Liver + Spleen + Gall Bladder + Genitals	1(10.00)
(d)	Small intestine + Liver + Spleen + Gall Bladder	2(20.00)
(e)	Small intestine. + Liver + Stomach + Genital	1(10.00)
(f)	Small intestine + Liver + Spleen + Pancreas	1(10.00)
(g)	Small intestine + Liver + Spleen + Stomach	1(10.00)
(h)	Small intestine + Liver + Kidney + Spleen	1(10.00)
<b>TOTAL</b>		<b>10(100.00)</b>

**Table 6: Blunt injuries of Kidney**

Internal Organs		Cases (%)
(a)	Kidney	2(33.33)
(b)	Kidney + Liver	2(33.33)
(c)	Kidney + Spleen + Pancreas	1(16.67)
(d)	Kidney + Liver + Spleen + Small intestine	1(16.67)
<b>Total</b>		<b>6 (100.00)</b>

**Table 7: Blunt injuries of Stomach**

Internal Organs		Cases (%)
(a)	Stomach	2(40)
(b)	Stomach + Liver	1(20)
(c)	Stomach + Spleen + Small intestine + Liver	1(20)
(d)	Stomach + Liver + Small intestine + Genital	1(20)
<b>Total</b>		<b>5(100)</b>