

## A Study of Correlation of Clinical, Roentgenographic and CT scan Findings in Cases of Abdominal trauma in Road Traffic Accidents

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**Abstract:** Trauma remains a major social and health problem. Abdominal injuries have existed as long as the mankind. It can be concluded from this study that blunt trauma abdomen due to road traffic accidents was found to have peak incidence in young population with male preponderance which shows that such accidents are common in persons with more outdoor activities. Urban population was more involved as compared to rural population. Common modes of injury were fall either from two wheeler or four wheeler, striking of pedestrian by two wheeler and two & four wheeler collision. Pain abdomen and distension were most common presenting symptoms while haematuria and retention of urine were common presenting symptoms when genitourinary tract was injured. Abdominal tenderness was almost exclusively present. Liver was the most common organ injured and it was followed by spleen. Most common associated injuries were thoracic and orthopedic injuries. The diagnosis was mainly based on thorough clinical examination, x-ray findings and CECT abdomen & pelvis and their co-relation. The mortality was found to be significantly higher when more than one factor was involved i.e. either other associated injuries were present or shock was present at the time of admission or delayed admission or multiple viscera were injured. The overall prognosis of these patients depends on the early and accurate diagnosis and prompt management.

**Keywords:** pedestrian, liver, x-ray, CECT.

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### I. Introduction

Trauma is the most dreaded, ever-increasing and challenging medical emergency of medical era, which mainly affects younger, healthy and productive population of society (1). A wide spectrum of injuries are observed in victims of accidents of which abdominal trauma is a frequent component. Vehicular trauma is by far the leading cause of blunt abdominal trauma in the civilian population (2). Trauma surgeons rely on number of diagnostic adjuncts (3) including X-ray, Four quadrant aspiration (4), Diagnostic peritoneal lavage (5,6), USG (7), CT scan (8), Diagnostic Laparoscopy, Focussed Assessment with Sonography for Trauma (FAST) (9,10).

### II. Aims And Objectives

1. To evaluate incidence of abdominal trauma in case of road traffic accident and its clinical assessment.
2. To correlate clinical findings to imaging studies i.e. roentgenography and CT scan in relation to intra-abdominal organs injured and to determine appropriate management strategy.

### III. Materials & Methods

- This clinical study was done prospectively in surgical wards of M.B. Govt. Hospital, Udaipur in 40 cases of BTA due to RTA.
- All patients were evaluated by clinical examination, X-ray imaging and CT scan of abdomen and pelvis.
- Patients that were excluded from this study were - patients in whom CT scan was not performed and patients of abdominal trauma due to causes other than road traffic accident.

### IV. Results

The present study was conducted prospectively in R.N.T. Medical College and associated M.B. Govt. Hospital, Udaipur in forty cases of blunt trauma abdomen due to road traffic accidents who were admitted in surgical wards.

- Maximum number (60%) of victims of blunt trauma abdomen were in reproductive age group (21-40 years).
- The male to female ratio was 39:1.
- 52.5% cases of blunt trauma were of urban background and rest were of rural background.
- The most common mode of injury was fall from two wheeler (55%). It was followed by fall from four wheeler, striking of pedestrian by two wheeler, two wheeler and four wheeler collision in 15% cases each.
- 47.5% cases were admitted in hospital within 6 hours of injury, 37.5% were admitted between 6-24 hours of injury and 15% were admitted after 24 hours of injury.

- Pain abdomen (97.5%) was the most common presenting symptom followed by abdominal distension (55%). Other presenting symptoms were vomiting (12.5%), haematuria (22.5%), retention of urine (5%) and external injury over abdomen (22.5%).
- Abdominal tenderness (97.5%) was the most common sign in case of blunt trauma abdomen. Other signs were external injury (40%), shock (35%), abdominal distension (47.5%), guarding (90%), lump per abdomen (10%), renal angle tenderness (10%), shifting dullness (67.5%), fluid thrill (55%), obliteration of liver dullness (32.5%), and absent bowel sounds (32.5%).
- 50% cases had associated extra-abdominal injuries. Patients with associated injuries had 20% mortality which is more as compared to those without associated injury who had 15% mortality.
- Most common associated injury was involvement of thorax and bones (20%). Other associated injuries were orthopedic injury (17.5%), head injury (5%), thoracic injury (5%) and thorax & head injury (2.5%).
- Mortality was maximum (100%) when associated injury included both head and thorax. It was followed by when associated thoracic injury (50%) was present and when orthopedic & thoracic injury were present (25%).
- 55% cases had haemoglobin <10 gm%, 47.5% cases had PCV <35% and 67.5% cases had total leukocyte count >10,000 cu/mm. Increased urea and creatinine was present in 37.5% and 17.5% cases respectively while 20% cases had RBC in urine.
- Plain X-ray film of abdomen revealed positive findings in 22 cases. Haziness was present in 21 cases and gas under diaphragm in 2 cases. X-ray pelvis showed pelvic fracture in 12 cases. X-ray chest showed pleural effusion in 3 cases, pneumothorax in 2 cases and rib fracture in 10 cases.
- CECT abdomen & pelvis was done in all 40 cases. Most common organ injured was liver (50%) followed by spleen (27.5%) and kidney (12.5%). Urinary bladder was ruptured in 10% cases while pancreas was injured in 7.5% cases. Haemo peritoneum was present in 95% cases. Bowel injury was present in 5% cases.
- About 52.5% had single visceral organ injury with 14.28% mortality and 25% had multiple visceral organ injury with 40% mortality.
- 77.5% cases had visceral organ injury with 22.5% mortality and 22.5% had non-visceral organ injury with no mortality.
- 35% cases admitted in state of shock with 28.57% mortality compared with 11.53% mortality in stable patients.
- 33% mortality was present in cases of delayed admission (>24 hours).
- 71% mortality was present when more than one factor was involved i.e. delayed admission, shock, associated injury and multiple visceral involvement.
- Most of the cases 52.5% were managed conservatively with 19.04% mortality compared to 15.79% mortality in operated cases.

**Table 1 Symptoms at the time of admission in hospital in blunt trauma abdomen patients of RTA (n=40)**

Presentation	No. of cases	%
Pain abdomen	39	97.5
Distension of abdomen	22	55.0
Vomiting	5	12.5
Haematuria	9	22.5
Retention of urine	2	5.0
External injuries over abdomen	9	22.5

**Table 2 Signs in cases of blunt trauma abdomen at the time of admission in hospital in case of RTA (n=40)**

Signs	No. of cases	%
External injury	16	40.0
Shock	14	35.0
Abdominal distension	19	47.5
Abdominal tenderness	39	97.5
Guarding	36	90.0
Lump over abdomen	4	10.0
Renal angle tenderness	4	10.0
Shifting dullness	27	67.5
Fluid thrill	22	55.0
Obliteration of liver dullness	13	32.5
Bowel sounds absent	13	32.5

**Table 3 Radiological investigations in cases of RTA (n=40)**

Investigations	No. of cases	%
1. Flat plate abdomen (in erect position)		
a) Gas under diaphragm	2	5.0
b) Haziness	21	52.5
2. Chest X-ray		
a) Pleural effusion	3	7.5
b) Pneumothorax	2	5.0
c) Fracture ribs	10	2.5
3. X-ray pelvis (having fracture)	12	30.0
4. X-ray long bones	5	12.5
5. X-ray spine (with fracture)	3	7.5

**Table 4 Management in blunt trauma abdomen (RTA) on the basis of CECT abdomen and pelvis (n=40)**

Organ	Injured	Operated	Conservative
Liver	I	-	1
	II	-	1
	III	8	7
	IV	1	1
Spleen	I	-	2
	II	-	1
	III	-	5
	IV	-	1
	V	3	-
Hemoperitoneum	+	2	8
	++	1	5
	+++	13	6
Kidney			5
Pancreas			2
Urinary bladder		4	
Small bowel		2	

### Bibliography

- [1]. WHO data's: Internet source – <http://www.emedicine.com/EMERG/topic>
- [2]. Murray CJ, Lopez AD .Alternative projections of mortality and disability by cause 1990 – 2020: Global Burden of Disease Study. Lancet. May 24 1997; 349 (9064):1498-504, 1269-76.
- [3]. Feliciano DV. Diagnostic modalities in abdominal trauma. Peritoneal lavage, ultrasonography, computed tomography scanning, and arteriography. Surg Clin North Am 1991; 72:241-56.
- [4]. Powell DC, Bivins BA, Bell RM. Diagnostics peritoneal lavage. Surg Gynec, Obstet. Aug 1982; 155 (2):257-64.
- [5]. Root HD, Hauser CW, Mc Kinley CR, et al. Diagnostic peritoneal lavage. Surg May 1965; 57:633-7.
- [6]. Engrave H, Benjamin CI, and et al. Diagnostic peritoneal lavage in blunt trauma abdomen .J of Trauma 1975; 15:854.
- [7]. Krisnensen JK, Bucmann B et al.: Ultrasonic scanning in the diagnosis of splenic haematoma. Acta Chem. Stand. 137:653, 1971.
- [8]. Pietzmen AB, Markaroun MS, Slasky BS, et al. Prospective study of CT scan in initial management of BAT. J Trauma 1986; 26: 585-92.
- [9]. Abu-Zidan FM, Dittrichk, Czechowski J, Kazzan E .Establishment of a 'Focussed Assessment Sonography for Trauma' (FAST) course, 2005.
- [10]. Scalea TM, Rodriguez A, et al. Focussed Assessment with Sonography for Trauma (FAST): results from an international consensus conference .J Trauma 1999; 46:466-72.