



ORIGINAL RESEARCH PAPER

Surgery

EVALUATION OF BLUNT ABDOMINAL TRAUMA BY MULTI-DETECTOR COMPUTED TOMOGRAPHY

KEY WORDS:

Trauma,blunt,MDCT,abdomen

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ABSTRACT

INTRODUCTION : Blunt Abdominal Trauma is one of the leading causes of mortality and morbidity in the present age most commonly due to road traffic accident followed by falls and other causes 1.MDCT plays a major role in the evaluation of the hemodynamically stable patients with high sensitivity and specificity.MDCT also helps in grading the organ injuries which in turns aids in appropriate management. **AIM :** Our study aims at evaluation of 80 pateints with blunt abdominal trauma with emphasis on early diagnosis and management. **MATERIALS AND METHODS :** This prospective study was done in patients who have been referred to our college with a history of blunt abdominal trauma for CECT abdomen and pelvis and hemodynamically stable .Imaging has been done with sections obtained from above the diaphragm to pubic symphysis.Plain study was done first followed by contrast injection as needed. **CONCLUSION :** Timely utilisation of proper imaging modalities along with clinical examination in patients with blunt abdominal trauma aims at significantly decreasing mortality and mobidity .

INTRODUCTION :

Blunt Abdominal Trauma is one of the leading causes of mortality and morbidity in the present age most commonly due to road traffic accident followed by falls and other causes 1. Many of these patients have multisystem injuries resulting from high velocity mechanism and identification of serious intra abdominal pathology is challenging.

Imaging plays a critical role in the evaluation of patients with blunt abdominal trauma.CT ass the sole modality ,enables evaluation of other associated injuries in addition to global evaluation of abdominal trauma.In blunt injuries ,the solid organs are mostly involved ,followed by the hollow organs².

MDCT has proved to be a highly sensitive and specific method for the detection of abdominal injury ,and is method of choice for the initial evaluation of patients who are hemodynamically stable.

MATERIALS AND METHODS :

A prospective study of 80 hemodynamically stable patients with blunt abdominal trauma referred to our department was done over a period of 14 months.

Exclusion criteria :

- 1.Hemodynamically unstable patients.
- 2.Patients with penetrating trauma.
- 3.Patients in whom I. V contrast was contraindicated.

TECHNIQUE :

Examination of patients was done using GE 16 slice CT scanner . Contrast CT scanning was performed with non-ionic, iodinated contrast was administered intravenously .The solid organ injuries detected were graded according to the CT grading system. Individual organ injuries were graded according to the OIS system and injury severity grades given by Moore E.E. et al 3 were followed.

OBSERVATION & RESULTS :

A. Age Distribution :

Of the 80 patients we evaluated,most sustained were in the age group of 20-40 yrs.

Table : 1 B. Sex Distribution :

S.NO	AGE GROUP	NUMBER(%)
1.	<10 Y	2 (3)

2.	11-20Y	9 (11)
3.	21-30Y	32(40)
4.	31-40Y	26 (32)
5.	41-50Y	7 (9)
6.	51-60Y	4 (5)
	TOTAL	80 (100)

Of the 80 patients we evaluated Males sustained more injuries than females in a ratio of 2:1 .

TABLE :2 C. MODE OF INJURY :

S. NO	SEX	NUMBER (%)
1.	MALE	56(70)
2.	FEMALE	24(30)
	TOTAL	80(100)

Road traffic accidents account for the most common cause among the 80 patients evaluated.

TABLE :3 D. ORGAN OF INJURY :

S.NO	ORGAN OF INJURY	NUMBER (%)
1.	LIVER	11(26.2)
2.	SPLEEN	16 (38.1)
3.	KIDNEYS	5 (11.9)
4.	HOLLOW VISCUS	4 (9.52)
5.	PANCREAS	2 (4.8)
6.	URINARY BLADDER	2 (4.8)
7.	MESENTERY	1 (2.4)
8.	VASCULAR INJURY	1 (2.4)
	TOTAL	42(100)

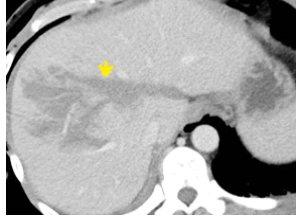
Of the 80 patients evaluated 42 were found to have internal injury and spleen was the most common organ injured.

TABLE :4 VISCERAL INJURY :

S.NO	ORGAN OF INJURY	NUMBER (%)
1.	LIVER	11(26.2)
2.	SPLEEN	16 (38.1)
3.	KIDNEYS	5 (11.9)
4.	HOLLOW VISCUS	4 (9.52)
5.	PANCREAS	2 (4.8)
6.	URINARY BLADDER	2 (4.8)
7.	MESENTERY	1 (2.4)
8.	VASCULAR INJURY	1 (2.4)
	TOTAL	42(100)

In our study we reported 42 cases with visceral injury involving one organ or more than one in few of the cases.

Injury to the liver :



Axial CECT image of the abdomen show hepatic laceration,grade III.

Renal Injury :



Axial CECT image showing grade III renal injury.

Splenic Injury :



Axial CECT image shows grade II splenic injury .

Pancreatic Injury :



CECT axial image shows a grade III pancreatic injury.

DISCUSSION :

Among the 80 cases studied, 28 had undergone for surgical management and 42 were managed conservatively, CT findings correlated with the operative finding in 26 of the 28 patients .

In this study, the most common organs affected in abdominal trauma were spleen and liver accounting for 38.1% and 26.2% each respectively, followed by the kidneys (12%), Mesentery (2.5%),Bowel (9.5%) .

In a study by Michael Federle et al ⁴100 cases of abdominal trauma were studied and there was maximum incidence of trauma in age group 21-30 years, which was 35%, followed by age group 11-20 years.

In our study maximum incidence of trauma was seen in age group 21-30 years which was 40%, followed by age group 11-20 years (11%) which is in keeping with the above study.

In our study, road traffic accidents (52 out of 80 cases) constituted majority of the cases, followed by fall from height with 14 of 80 patients and 9 patients had history of assault.Mortan et al⁵and Perry⁶

Laal Met al⁷studied 16,573 patients out of which 106 patients had renal injuries. Out of these 106 cases majority of cases belonged to gradeI constituting 62.3% of cases followed by grade II and grade III with incidence of 13.2%.

In our study of renal injuries of 5 patients, grade IV and grade III constituted 40% and 20 % respectively.

Khan JS et al⁸ studied 100 cases of abdominal trauma and most of the liver injuries fell under grade I injuries (42.8%) followed by grade II and grade III injuries (22.85%).

In our study of 11 Liver injuries, 6 patients presented with grade II constituting 54.5%, followed by grade III (35.5 %) and grade I (10%).

Anderson W S et al⁹ studied 68 patients of splenic trauma out of which 47 patients underwent computed tomography for examination of abdominal injuries. Out of these 47 cases majority of cases belonged to grade II constituting 45% of cases followed by grade III and grade IV with incidence of 21% & 19% respectively. Grade I and grade V was diagnosed in 6 and 1 case respectively out of 47 cases with incidence of 13% and 9% each.

In our study of 16 splenic injuries, 6 patients presented with grade II constituting 37.5%, followed by grade III, grade IV & grade V constituting 30%,20%,12.5% respectively in accordance with the above study.

CONCLUSION :

The challenge in imaging abdominal trauma is to accurately identify injuries that require early exploration and at the same time avoid unnecessary operative intervention in cases that can be managed conservatively.

Solid organs are more prone to abdominal injuries than hollow organs.

Spleen was the most commonly injured organ in this study, followed by liver and kidney.

Morbidity and mortality can be minimized in blunt trauma abdomen patients by prompt evaluation of abdomen. Hemodynamic stability assessment along with CECT abdomen are best in evaluating patients who may require surgery or in deciding which patient can be discharged from emergency department.

Immediate identification, timely and proper utilisation of imaging modalities in blunt trauma abdomen patients along with thorough clinical examination have significantly decreased the number of unnecessary emergency laparotomies and has increased rates and success of management of solid organ injuries.

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