

Study on Abdominal Trauma Patients Comparatively by Ultrasonography and CT

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ABSTRACT

Introduction: The introduction of CT and US has holds major advance in trauma care. Despite of improved resolution of the ultrasound machines 50% of solid injuries are missed. CT has been used in blunt trauma for more specificity. Study aimed to asses the role of ultrasonography and CT in patients with abdominal trauma.

Material and methods: 100 patients were randomly selected in the Department of Radiodiagnosis, Patna Medical College and Hospital, Patna with blunt abdominal trauma during period 2014 to 2015. They were sent for CT and Ultrasonography.

Result: CT was more sensitive in detecting organ injury.

Conclusion: Ultrasonography is initial modality in patients with abdominal trauma but CT is required in most US positive patients to know the exact extent of injury.

Keywords: Abdominal Trauma. Ultrasonography, CT

INTRODUCTION

Trauma is defined as “Unsolved epidemic” in modern society and estimated loss of life equals to cardiovascular disease and cancer combined and is leading cause of death in patients younger than 40 years.¹ Prevalence of intra abdominal injuries ranges from 7.7% to 65 %.²

Ultrasound is rapid and cost effective and is highly efficient to detect free fluid in abdomen.³ Ultrasonography for blunt abdominal trauma was first described in 1971 and currently used is more in evaluation of pleural and pericardial fluid. “Focussed Assessment with sonography for Trauma” (FAST) is method to detect intraperitoneal fluid.⁴ Even improved ultrasound machines have only 50% specificity in solid organ injuries.⁵

The introduction of CT hold major advance in trauma care. CT evaluates both abdomen and retroperitoneum, describes functional status of kidney and also detect skeletal injuries.⁶ Computed tomography has been introduced to evaluate patients having blunt abdominal trauma among FAST positive patients.^{7,8} Our aim was to assess the role of Ultrasonography and CT in patients with abdominal trauma. Reports were then compared and diagnostic accuracy of the two imaging modalities in detecting abdominal organ injury were compared.

MATERIAL AND METHODS

The study was done in Dept of Radiodiagnosis, Patna Medical College Hospital, Patna, India between 2014 to 2015. This study was conducted on 100 patients having blunt abdomen trauma reported during period of 2014 to 2015. 100 patients who reported in the OPD having blunt abdomen injury were then sent to USG and CT. Ethical clearance was taken before the start of study. Consent was taken from all the patients. Patients having history of abdominal trauma were included in the study. Patients from OPD Surgery and Medicine, having

blunt abdominal trauma were send for Ultrasonography and CT. Patients having only pain abdomen were excluded in this study. FAST was done as a quick screening test. They were sent to USG and CT and findings were then compared.

STATISTICAL ANALYSIS

Microsoft office 2007 was used for the statistical analysis. Descriptive statistics like mean and percentages were used interpret the data.

RESULTS

Of the total 100 patients maximum (40) were in the age group of 21-30 (40%) then were in 31-40 (23) age group. Very less patients were above 60 years (table 1). Only 1 patient was admitted above 70 years. 9 patients were recorded in 11-20 age group, 8 patients in 41- 50, 6 patients in 51- 60 and 2 patients in 61- 70 age groups (table 1). Out of 100 patients 81 patients were male and 19 patients were female. Although USG was sensitive but CT was superior in detecting solid organ injury. The most common organ injured was spleen (40) followed by kidney (35), liver (34), pancreas (12), Retroperitoneal haematoma (4), urinary bladder (6), bowel (6), pleural collection (4). CT showed 100% accuracy in diagnosis of abdominal organ injures (table 2).

DISCUSSION

In our study male predominance (81%) was found which was supported by other study.^{9,10} 63% patient belonged to 21-40 years, which is believed to be most active spam of live.^{11,12}

Sr. No.	Age (Years)	Total
1	0-10	11
2	11-20	9
3	21-30	40
4	31-40	23
5	41-50	8
6	51-60	6
7	61-70	2
8	71 Up	1
Total		100

Table-1: Shows age distribution

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Sr. No	Organ	Positive on Ultrasound	Positive on CT scan	Confirmed cases.
1	Spleen	30	40	40
2	Kidney	22	35	35
3	Liver	20	34	34
4	Pancreas	10	12	12
5	Retroperitoneal Haematoma	4	6	6
6	Urinary bladder	6	8	8
7	Bowel	6	8	8
8	Pleural Collection	6	6	6

Table-2: Distribution of Injury according to organ injury.

Studies shows that trauma is the leading cause of death in the United States for men and women under the age of 45 years.¹³ In 2007, over 180,000 people died of trauma¹³ and above all abdominal injuries was the important cause of death.¹³ The reason behind deaths is the damage to the abdominal organs done due to external compression and crushing injuries.¹⁴ All patients had intra abdominal free fluid detected by US and CT.¹³ Spleen is the most common intra abdominal organ injured in blunt abdominal trauma and our study has 40% confirmed by CT where as only 30% cases were detected by US.¹⁵

Second commonest injured organ was kidney (35%) but by US only 22% were detected. The accuracy is comparable with other studies.^{16,17}

Liver was the third most frequently injured organ in blunt abdominal trauma in our study (34%).¹⁸ Timely and accurate diagnosis and characterization of liver trauma is important in guiding clinical management decisions. The liver injury scale is based on the presence, location and size of liver laceration and hematomas. In this study spleen and kidney were the common organs injured followed by liver which was similar to study by Barry D Tombs et al.¹⁹

Pancreatic injury is not common in blunt abdominal injury. Blows to the mid – upper abdomen with a steering wheel or bicycle handle bars are the main cause of pancreatic injury. Our study accounts only 12%, Urinary bladder (8%) injury, bowel (8%) injury, pleural collection (6%), other studies reported a very less data.^{20,21} Ruptures of the urinary bladder usually occurs as a complication of pelvic fracture especially in patients having distended bladder at the time of accidents.²⁰ CT are more sensitive than USG in detecting those injuries.

CONCLUSION

USG is a valuable initial modality in patients with abdominal trauma but CT increase diagnostic confidence. CT is required in most USG positive patients and also in US negative patients in order to investigate organ damage.

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