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Comparative Study Of Ultrasound And Computed Tomography Finding In Blunt Abdominal Trauma

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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.

Aim: 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, SMT.NHL Medical College, and SVP Hospital, Ahmedabad with blunt abdominal trauma during period 2022 to 2023. 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

In today's world, trauma is known as the "Unsolved epidemic" and is the largest cause of patient death, with an estimated death toll equivalent to that of cancer and cardiovascular disease combined. under 40 years old.1 There is a 7.7% to 65% prevalence of intra-abdominal injuries.2

Ultrasound is a quick, affordable, and very effective way to find abdominal free fluid.3 Blunt ultrasonography The first description of abdominal trauma dates back to 1971, and its present application mostly involves the assessment of pericardial and pleural effusion. The FAST method, or "Focussed Assessment with sonography for Trauma," is used to find intraperitoneal fluid.4 Even the most advanced ultrasound devices can only identify lesions to solid organs with 50% specificity.5 CT's introduction represents a significant advancement in trauma care.

CT assesses the retroperitoneum and abdomen, characterises kidney function, and looks for skeletal injuries.6 In order to assess individuals who have experienced blunt abdominal injuries and test positive for FAST, computed tomography has been introduced.7,8, Our goal was to evaluate the utility of CT and ultrasound in patients who had suffered abdominal injuries. The diagnostic precision of the two imaging modalities in identifying damage to abdominal organs was then compared, along with the reports.

Material And Methods:

The study was conducted from 2022 to 2023 in the SMT.NHL Medical College and SVP Hospital's Department of Radiodiagnosis in Ahmedabad, India. This investigation involved 100 patients with blunt abdominal trauma reported between 2022 and 2023. Following their OPD report, 100 patients with traumatic abdominal injuries were referred to CT and USG. The study was cleared ethically before it began. Every patient gave their consent.

The study included patients with a history of abdominal trauma. Patients with blunt abdominal trauma from the OPD Surgery and Medicine were sent for CT and ultrasonography. In this study, patients with abdominal pain alone were not included. FAST served as a brief screening examination. They were dispatched to The results of the USG and CT 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).

TABLE 1 Shows age distribution

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-2 Distribution of Injury according to organ injury

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

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5	Retroperitoneal Haematoma	4	6	6
6	Urinary bladder	6	8	8
7	Bowel	6	8	8
8	Pleural Collection	6	6	6

Discussion:

Male predominance (81%) was seen in our investigation, and this finding was corroborated by other studies.9,10 63% of patients were between the ages of 21 and 40, which is thought to be the most active spam demographic.11,12

According to studies, trauma is the top cause of death in the US for both men and women under the age of 45.13

More than 180,000 people died from trauma in 2007.13 and most importantly Injury to the abdomen was the primary cause of mortality.13 Damage to the abdominal organs from external compression and crushing traumas is the cause of deaths.14 By using CT and US, intra- abdominal free fluid was found in every patient.13The most often injured intra-abdominal organ in cases of forceful abdominal trauma is the spleen. According to our study, 40% of cases were confirmed by CT, but only 30% were found by US.15

The kidney was the second most often injured organ (35%) yet just 22% were found in the US. The accuracy is on par with findings from prior research.16,17

In our study, the liver ranked third among the organs most commonly injured in forceful abdominal trauma (34%).18 It's critical to promptly and accurately diagnose and characterise liver trauma in Guiding choices made in clinical management. The existence, location, and size of liver lacerations and hematomas are the basis for the liver injury scale. Similar to a study by Barry D. Tombs et al.,19 the common organs affected in this investigation were the spleen, kidney, and liver.

Blunt abdominal injuries seldom result in pancreatic damage. Pancreatic injuries are primarily caused by blows to the mid-upper abdomen with a steering wheel or bicycle handlebars. Our research only accounts for 12%, whereas other studies gave quite little data. Injuries to the intestine (8%), bladder (8%), and pleura (6%).20,21 Bladder ruptures are typically a result of pelvic fractures, particularly in individuals who were experiencing bladder distention at the time of the incident.20 When it comes to identifying such ailments, CT is more sensitive than USG.

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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