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Original Research

Ultrasonography and CT in evaluation of patients with blunt abdominal trauma

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ABSTRACT:
Background: This study was conducted for assessment of role of Ultrasonography and CT in evaluation of patients with blunt abdominal trauma. **Material and methods**: This study comprised of 50 participants with blunt abdominal trauma. The subjects were informed about the procedure and were asked for consent. The subjects with blunt abdominal trauma and the ones who were willing to participate in the study had been included in the study whereas the subjects unwilling to take part in the study had been excluded from the study. The subjects underwent ultrasonographic as well as CT evaluation. Statistical analysis was conducted using SPSS software. **Results**: In this study of 50 subjects, 25 were males and 25 were females. CT revealed splenic injury, liver injury as well as kidney injury in 26, 19 and 5 subjects, respectively. Parenchymal abnormalities and traumatic injuries were revealed by USG in 13 as well as 9 subjects. **Conclusion**: The lesions revealed by CT were splenic, liver and kidney injuries whereas USG revealed traumatic injuries and parenchymal abnormalities. Both CT and USG play a significant role in the evaluation of subjects having blunt abdominal trauma.
Keywords: ultrasonography, computed tomography, blunt abdominal trauma.

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INTRODUCTION

Blunt abdominal trauma is a primary cause of death in the adult population but prompt diagnosis can reduce mortality. Computer Tomography (CT) is currently the diagnostic method of choice for assessing trauma patients, although CT usually requires transfer outside the emergency roomand thereby exposure to possible further harm.[1-4]

Ultrasonography (US) has shown a poor sensitivity in the evaluation of abdominal injuries, but being feasible immediately at the bedside without interrupting other resuscitation procedures, US is the first-line approach in the assessment of abdominal trauma.[5,6] "Focused Abdominal Sonography in Trauma" (FAST) is a specific method which aims at identifying hemoperitoneum.[7]

US is widely used in the emergency room for evaluation of patients with blunt abdominal trauma. The role of this method is well-established in hemodynamically unstable patients in whom the presence of hemoperitoneum immediately leads to surgical treatment.[8-10]

The role of diagnostic imaging is quite different in stable patients, as accurate assessment of the organ damage is necessary in order to proceed with the most suitable therapy: conservative treatment, surgery or interventional radiology.[11] However, US has shown a low sensitivity in identifying injury to abdominal organs.[12,13]

CEUS is significantly more accurate in identifying post-traumatic injury to abdominal solid organs, reaching a sensitivity almost equal to that of CT.[14,15]

This study was conducted for assessment of role of Ultrasonography and CT in evaluation of patients with blunt abdominal trauma.

MATERIAL AND METHODS

This study comprised of 50 participants with blunt abdominal trauma. The subjects were informed about the procedure and were asked for consent. The subjects with blunt abdominal trauma and the ones

who were willing to participate in the study had been included in the study whereas the subjects unwilling to take part in the study had been excluded from the study. The subjects underwent ultrasonographic as well as CT evaluation. Statistical analysis was conducted using SPSS software.

RESULTS

Table 1: Gender-wise distribution of subjects.

Gender	Number of subjects	Percentage
Males	25	50%
Females	25	50%
Total	50	100%

In this study of 50 subjects, there were 25 males and 25 females.

Table 2: Lesions revealed by CT

Lesions revealed by CT	Number of cases
Splenic injury	26
Liver injury	19
Kidney injury	05
Total	50

CT revealed splenic injury, liver injury as well as kidney injury in 26, 19 and 5 subjects, respectively.

Table 3: Lesions revealed by ultrasonography

Lesions revealed by ultrasonography	Number of cases
Parenchymal abnormalities	13
Traumatic injuries	09
Total	22

Parenchymal abnormalities and traumatic injuries were revealed by USG in 13 as well as 9 subjects.

DISCUSSION

Whereas the diagnosis of penetrating abdominal injury presents little if any problems, blunt abdominal injury creates a scenario where diagnostic investigations must be used to good effect, in order to determine, which patients need to be operated on, with a view to achieving the best possible outcome.[16]

Unlike in the developing world, in the developed world, there is a preponderance of available diagnostic tools. Most of the authors would regard computed tomography scans, laparoscopy, diagnostic peritoneal lavage (DPL) and abdominal ultrasonography (US) as key tools in the evaluation of the patient with blunt abdominal trauma.[17,18] However, there is a difference in the opinion as to the usefulness and diagnostic value of abdominal ultrasound scan.[19-21]

This study was conducted for assessment of role of Ultrasonography and CT in evaluation of patients with blunt abdominal trauma.

In this study of 50 subjects, 25 were males and 25 were females. CT revealed splenic injury, liver injury as well as kidney injury in 26, 19 and 5 subjects, respectively. Parenchymal abnormalities and traumatic injuries were revealed by USG in 13 as well as 9 subjects.

Wening JV (1989)[22]analysed the data of 136 patients with multiple injuries treated between 1983 and 1988 in order to assess the sensitivity, specificity, and accuracy of ultrasound, lavage and computed tomography (CT) for the preoperative diagnosis of blunt abdominal trauma. CT was carried out in doubtful cases (n = 29) if ultrasound and lavage had not provided sufficient information. Fifty-eight patients were primarily excluded from the study because neither clinical examination nor ultrasound gave any sign of an intra-abdominal lesion. In 25 cases, sonography could be compared with lavage, CT, and the intraoperative situs. Ultrasound showed reliable results in respect to accuracy (100%), sensitivity (84%), and specificity (98%). Computed tomography confirmed all sonographic diagnoses in 29 patients but did not provide further information. Peritoneal lavage gave correct information in all patients operated upon. Their 5-years' experience suggests that ultrasound is a reliable, quick, cheap, and repeatable technique of great value in patients with blunt abdominal traumata.

Abu-Zidan FM et al (1999)[23]compared the results of ultrasonography and CT of the abdomen in blunt trauma in a district general hospital. The hospital records of 25 patients who were admitted with blunt abdominal trauma to Southland Hospital, Invercargill, New Zealand, between January 1991 and November 1996 and who had both ultrasound and CT of the abdomen within 48 h of admission were reviewed. Ultrasound missed seven lesions in seven patients (7/25, 28%) compared with CT. Three of these were intestinal lesions that needed laparotomy. Ultrasound had a usefulness index of 1, 0.76, 0.72, 0.69 and 0, respectively, for detecting lesions of the kidneys, free intraperitoneal fluid, the liver, the spleen, and intestines. Although ultrasound can be used as an initial screening method for blunt abdominal trauma, CT is still the imaging modality of choice for detecting intra-abdominal lesions for stable patients in a district general hospital.

CONCLUSION

The lesions revealed by CT were splenic, liver and kidney injuries whereas USG revealed traumatic injuries and parenchymal abnormalities. Both CT and USG play a significant role in the evaluation of subjects having blunt abdominal trauma.

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