

A study of diagnostic efficacy of fast in blunt abdominal trauma

Anil Baliram Bonde¹, Vinod Narayanrao Chaudhari^{2*}

¹Assistant Professor, ²Associate Professor, Department of Radiology, Dr Ulhas Patil Medical College and Hospital, Jalgaon, Maharashtra.
Email: anil_bonde@rediffmail.com

Abstract

Background: Blunt abdominal trauma is a leading cause of both morbidity and mortality in patients in the emergency department. **Aims and Objectives:** Study of Diagnostic Efficacy of FAST in Blunt Abdominal Trauma **Methodology:** This was a cross-sectional study at Radiology department of tertiary health care center. All the Patients of All age group referred from Surgery department with blunt trauma was included into study. All the patients first evaluated by FAST and later on confirmed by Laparotomy Results. Here the Diagnostic efficacy of FAST Calculated by Sensitivity, Specificity, PPV and NPV. **Result:** In our study we found that The majority of the patients were from the age group of >60 -29.41% followed by 50-60 19.60%-40-50-17.64% ; 30-40-15.68%; 10-20-9.80%; 20-30-7.84%.The majority of the Patients were Male i.e. 66.67% as compared to Females 33.33%.The sensitivity of FAST was 87.50% and Specificity was 94.73% and Positive Predictive values were 96.55% and Negative Predictive value 81.81%. **Conclusion:** The usefulness and Diagnostic efficacy of FAST is very high as in our study sensitivity of FAST was 87.50% and Specificity was 94.73% and Positive Predictive values were 96.55% and Negative Predictive value 81.81%. So FAST is easy and Bedside test and useful for early theurapticintervention.

Key Word: FAST, Blunt Abdominal Trauma

*Address for Correspondence:

Dr. Vinod Narayanrao Chaudhari, Associate Professor, Department of Radiology, Dr Ulhas Patil Medical College and Hospital, Jalgaon, Maharashtra.

Email: drvinochdudhari@yahoo.co.in

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INTRODUCTION

Blunt abdominal trauma is a leading cause of both morbidity and mortality in patients in the emergency department.¹ A retrospective study by Schurink *et al* in 1997 showed that abdominal examination produced equivocal results in nearly half the patients with multiple injured trauma patients.² Multi-slice CT scans can produce very detailed images, are noninvasive and have become the gold standard investigation in assessing blunt abdominal trauma. With the development of helical CT,

the scan time has been significantly reduced, improving its usefulness with a sensitivity and specificity of over 95% in detecting intra-abdominal injury and a high negative predictive value of nearly 100%.³ It is also useful for localising, identifying and assessing severity of solid organ injury helping guide the non operative management or surgical planning.⁴ The need for a prompt diagnostic technique that could be used in the emergency setting led to the introduction of focused assessment with sonography in trauma (FAST) in emergency departments in the 1990's. It is undertaken after the primary survey in order to identify the presence of free fluid in the peritoneal cavity, which may represent haemoperitoneum, and thus enable early referral for further imaging (CT), and/or surgery if necessary.¹ Studies have shown that FAST can pick up as little as 100 ml of free fluid, characterised by low echogenicity which appears black on screen, or blood which is of increased echogenicity.⁵ There is some evidence to suggest it can detect as little as 30 ml of free fluid, but 100 ml is generally considered to be the level at which FAST scanning is accurate.⁶ Knowing that a patient has free fluid suggests the

possibility of severe intra-peritoneal haemorrhage and supports the case for further management, such as an emergency CT and/or surgery. Haemodynamically stable patients may be sent for CT scanning in order to assess the origin and extent of injury so as to achieve prompt and appropriate management, whilst haemodynamically unstable patients may be taken directly to the operating theatre for emergency laparotomy where a lack of formal, comprehensive imaging could potentially lengthen the theatre time as the site and extent of injury is unknown. Unlike FAST scan, CT's are able to detect solid organ injury, however a large study by Fakhry *et al* in 2003 showed that nearly 15% of patients with perforated small bowel injury had a normal pre-operative CT scan so they are not without limitation.⁷ In unstable patients where time is critical, ultrasound is quick and can be done at the bedside, several observational studies have shown its utility as a screening test in this setting.^{8,9}

AIMS AND OBJECTIVES

Study of Diagnostic Efficacy of FAST in Blunt Abdominal Trauma

METHODOLOGY

This was a cross-sectional study at Radiology department of tertiary health care center. All the Patients of All age group referred from Surgery department with blunt trauma were included into study. All the patients first evaluated by FAST and later on confirmed by Laparotomy Results. Here the Diagnostic efficacy of FAST Calculated by Sensitivity, Specificity, PPV and NPV.

RESULT

Table 1 : Age wise distribution of the Patients

Age	No.	Percentage
10-20	5	9.80%
20-30	4	7.84%
30-40	8	15.68%
40-50	9	17.64%
50-60	10	19.60%
>60	15	29.41%
Total	51	100.00%

The majority of the patients were from the age group of >60 -29.41% followed by 50-60 19.60%-40-50-17.64% ; 30-40-15.68%; 10-20-9.80%; 20-30-7.84%.

Table 2: Gender wise distribution of the Patients

Sex	No.	Percentage (%)
Male	34	66.67%
Female	17	33.33%
Total	51	100.00%

The majority of the Patients were Male i.e. 66.67% as compared to Females 33.33%.

Table 3: Comparative of FAST results with laparotomy finding

FAST	Laparotomy		Total
	Positive pathology	Negative pathology	
Positive FAST	28	1	29
Negative FAST	14	18	22
Total	32	19	51

The sensitivity of FAST was 87.50% and Specificity was 94.73% and Positive Predictive values were 96.55% and Negative Predictive value 81.81%.

DISCUSSION

US is a good modality in the trauma setting because examinations can be performed quickly at a patient's bedside, the US scanner is portable, and US is highly sensitive to the presence of free peritoneal fluid¹⁰. However, since US is not sensitive for the detection of parenchymal lesions and because hemoperitoneum is not always present in patients with solid organ injuries, US is not a reliable method for use in the exclusion of abdominal lesions¹². Taylor and Sivit¹¹ discussed this drawback and reported that screening US for blunt abdominal trauma should be approached with caution. In their large cohort study, they noted the absence of peritoneal fluid in 37% of children with intraabdominal injuries, and they emphasized the limited importance of peritoneal fluid as a predictor of the need for laparotomy. Emery *et al*¹³ reached the same conclusions when they found that 34% of children with normal findings at screening US had an intraabdominal injury at CT. Benya *et al*¹⁴ concluded their prospective study by suggesting that normal US findings failed to ensure the absence of intraabdominal injury, and, therefore, US was not adequately helpful to the pediatric trauma surgeon when treatment had to be planned. However, the accurate assessment of parenchymal findings in lesions (extension, presence of hematoma, vascular injuries, etc) is particularly important in children, as nonsurgical treatment has long been the accepted strategy for the care of hemodynamically stable pediatric patients¹⁵. In our study we found that The majority of the patients were from the age group of >60 -29.41% followed by 50-60 19.60%-40-50-17.64%; 30-40-15.68%; 10-20-9.80%; 20-30-7.84%. The majority of the Patients were Male i.e. 66.67% as compared to Females 33.33%. The sensitivity of FAST was 87.50% and Specificity was 94.73% and Positive Predictive values were 96.55% and Negative Predictive value 81.81%.

CONCLUSION

The usefulness and Diagnostic efficacy of FAST is very high as in our study sensitivity of FAST was 87.50% and

Specificity was 94.73% and Positive Predictive values were 96.55% and Negative Predictive value 81.81%. So FAST is easy and Bedside test and useful for early theurapticintervention.

REFERENCES

1. Smith J. Focused assessment with sonography in trauma (FAST): should its role be reconsidered? *Postgrad Med J* 2010;86: 285e91. doi:10.1136/ pgmj.2008.076711. originally published online April 3, 2010.
2. Schurink GW, Bode PJ, van Luijt PA, van Vugt AB. The value of physical examination in the diagnosis of patients with blunt abdominal trauma: a retrospective study. *Injury* 1997; 28(4):261e5.
3. Peitzman AB, Makaroun MS, Slasky BS, Ritter P. Prospective study of computed tomography in initial management of blunt abdominal trauma. *J Trauma* 1986; 26(7):585e92.
4. Clinical policy: critical issues in the evaluation of adult patients presenting to the emergency department with acute blunt abdominal trauma. *Ann Emerg Med* 2004; 43(2):278e90.
5. Branney SW, Wolfe RE, Moore EE, Albert NP, Heinig M, Mestek M. Quantitative sensitivity of ultrasound in detecting free intraperitoneal fluid. *J Trauma* 1995; 39(2):375e80.
6. Paajanen H, Lahti P, Nordback I. Sensitivity of transabdominal ultrasonography in detection of intraperitoneal fluid in humans. *Eur Radiol* 1999; (7):1423e5.
7. Fakhry SM, Watts DD, Lunchette FA. Current diagnostic approaches lack sensitivity in the diagnosis of perforated blunt small bowel injury; analysis from 275,557 trauma admissions from the EAST multi-institutional HVI trial. *J Trauma* 2003; 54(2):295e306.
8. Bode PJ, Edwards MJ, Kruit MC, vanVugt AB. Sonography in a clinical algorithm for early evaluation of 1671 patients with blunt abdominal trauma. *AJR Am J Roentgenol* 1999; 172: 905e11.
9. Lee BC, Ormsby EL, McGahan JP, MelendresGM, Richards JR. The utility of sonography for the triage of blunt abdom- inal trauma patients to exploratory laparotomy. *AJR Am J Roentgenol* 2007; 188: 415e21.
10. Rossi D, de Ville de Goyet J, Clement de Clety S, *et al.* Management of intra-abdominal organ injury following blunt abdominal trauma in children. *Intensive Care Med* 1993; 19: 415– 419.
11. Taylor GA, Sivit CJ. Posttraumatic peritoneal fluid: is it a reliable indicator of intraabdominal injury in children? *J PediatrSurg* 1995; 30: 1644 –1648.
12. Chiu WC, Cushing BM, Rodriguez A, *et al.* Abdominal injuries without hemoperitoneum: a potential limitation of focused abdominal sonography for trauma (FAST). *J Trauma* 1997;42:617– 623
13. Emery K, McAnaney CM, Racadio JM, Johnson ND, Evora DK, Garcia VF. Absent peritoneal fluid on screening trauma ultrasonography in children: a prospective comparison with computed tomography. *J PediatrSurg* 2001; 36: 565– 569.
14. Benya EC, Lim-Dunham JE, Landrum O, Statter M. Abdominal songraphy in examination of children with blunt abdominal trauma. *AJR Am J Roentgenol* 2000; 174: 1613–1616.
15. Bond SJ, Eichelberger MR, Gotschall CS, Sivit CJ, Randolph JG. Nonoperative management of blunt hepatic and splenic injury in children. *Ann Surg* 1996;223:286 – 289.

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