



RESEARCH ARTICLE

Role of Extended FAST in Assessing Visceral Injuries in Blunt Abdominal Trauma

Sapna Kaushik¹, Manjit Tanwar², K.S Goel³, Monu Sarin⁴

ABSTRACT

Background: Blunt abdominal trauma (BAT) is a significant cause of morbidity and mortality worldwide, particularly in developing countries. Early diagnosis of visceral injuries is essential for timely management. Extended Focused Assessment with Sonography in Trauma (eFAST) is widely used as a rapid bedside diagnostic tool.

Methods: This prospective observational study included 60 patients presenting with blunt abdominal trauma. All patients underwent eFAST examination. Findings were correlated with contrast-enhanced computed tomography (CECT) and/or intraoperative findings. Sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) were calculated.

Results: The mean age was 37.22 ± 12.16 years, with male predominance (78.3%). Road traffic accidents were the most common cause (61.7%). eFAST detected free intraperitoneal fluid in 31.7%, pneumothorax in 11.7%, and hemothorax in 6.7%. Sensitivity, specificity, PPV, NPV, and overall accuracy were 85.2%, 90.9%, 88.5%, 88.2%, and 88.3%, respectively.

Conclusion: eFAST is a rapid, reliable, and highly specific bedside tool in blunt abdominal trauma. However, due to limitations in detecting certain injuries, it should be supplemented with CT imaging in stable patients.

Keywords: eFAST, blunt abdominal trauma, ultrasound, visceral injury, hemoperitoneum

Indian J. Pharm. Biol. Res. (2026): <https://doi.org/10.30750/ijpbr.14.3.58>

INTRODUCTION

Blunt abdominal trauma (BAT) is a major contributor to trauma-related morbidity and mortality worldwide. The rising incidence of road traffic accidents, particularly in developing countries, has significantly increased the burden of abdominal injuries[1,2].

Diagnosis of intra-abdominal injuries is often challenging due to the absence of obvious external signs. Traditionally, diagnostic peritoneal lavage and computed tomography (CT) scan have been used, but these methods have limitations in emergency settings[3].

The introduction of Focused Assessment with Sonography in Trauma (FAST), and its extension to eFAST, has revolutionized trauma care by allowing rapid bedside evaluation of both abdominal and thoracic injuries[4].

eFAST is non-invasive, repeatable, and can be performed during resuscitation. However, its sensitivity varies depending on the type and timing of injury[5].

This study aims to evaluate the role of eFAST in detecting visceral injuries in blunt abdominal trauma and to correlate its findings with CT and operative outcomes.

MATERIALS AND METHODS

This prospective cross-sectional study was conducted in the Department of General Surgery at SGT Medical College,

¹Postgraduate Resident, Department of General Surgery, SGT Medical College, Gurugram, Haryana, India

²Associate Professor, Department of Surgery, SGT Medical College, Gurugram, Haryana, India

³Professor & Head, Department of Surgery, SGT Medical College, Gurugram, Haryana, India

⁴Professor, Department of Radio-diagnosis, SGT Medical College, Gurugram, Haryana, India

Corresponding Author: Manjit Tanwar, Associate Professor, Department of Surgery, SGT Medical College, Gurugram, Haryana, India. E-MAIL: drmnjt@gmail.com

How to cite this article: Kaushik S, Tanwar M, Goel KS, Sarin M. Role of Extended FAST in Assessing Visceral Injuries in Blunt Abdominal Trauma J. Pharm. Biol. Res. 2026;14(3):373-375.

Source of support: Nil

Conflict of interest: None.

Received: 09/07/2026 **Revised:** 05/08/2026 **Accepted:** 12/08/2026

Published: 18/08/2026

Gurugram, over a period of 18 months after obtaining ethical clearance.

A total of 60 patients presenting with blunt abdominal trauma were included. Patients with penetrating injuries and pregnant females were excluded.

All patients underwent eFAST examination using a curvilinear probe (2–5 MHz), assessing:

- Right upper quadrant
- Left upper quadrant
- Pelvic region
- Pericardial region
- Thoracic views

Findings were recorded as positive or negative for free fluid or injury.

Hemodynamically stable patients underwent contrast-enhanced CT (CECT), while unstable patients were managed based on clinical and eFAST findings.

Statistical analysis was performed using SPSS software. Sensitivity, specificity, PPV, and NPV were calculated using CT or operative findings as the gold standard.

RESULTS

A total of 60 patients were included in the study. The mean age was 37.22 ± 12.16 years, with a male predominance of 78.3%. Road traffic accidents were the most common mode of injury (61.7%).

eFAST Findings

- Free intraperitoneal fluid: 31.7%
- Pneumothorax: 11.7%
- Hemothorax: 6.7%
- Pericardial effusion: 0%

Visceral Injury Detection

In 66.7% of cases, no specific organ injury could be localized by eFAST alone. Among identifiable injuries:

- Lung: 13.3%
- Liver: 5%
- Bowel: 5%
- Urinary bladder: 5%
- Spleen/combined: 5%

Diagnostic Accuracy

- True Positive: 23
- True Negative: 30
- False Positive: 3
- False Negative: 4

Management Outcome

- Conservative: 55%
- Operative/intervention: 43.3%

DISCUSSION

The present study evaluated 60 patients with blunt abdominal trauma using eFAST and found that most patients were young to middle-aged adults, with a mean age of 37.22

Parameter	Value
Sensitivity	85.2%
Specificity	90.9%
PPV	88.5%
NPV	88.2%
Accuracy	88.3%

± 12.16 years, and predominantly male (78.3%). Road traffic accidents were the most common cause of injury (61.7%), and most patients were hemodynamically stable at presentation (91.7%). This reflects the common trauma pattern seen worldwide, where younger males are more frequently involved in high-energy injuries due to greater exposure to travel, occupational hazards, and outdoor activities. Similar findings were reported by Ghafouri et al. and Planquart et al., supporting the demographic pattern seen in the present study .

Free intraperitoneal fluid was detected in 31.7% of patients, pneumothorax in 11.7%, and hemothorax in 6.7%, showing the usefulness of eFAST in both abdominal and thoracic trauma assessment. The thoracic component helps in rapid bedside diagnosis without delaying treatment. Netherton et al. and Akoglu et al. also reported high specificity of eFAST, especially as a rule-in test for trauma, supporting its value in emergency settings .

The present study showed good diagnostic performance of eFAST, with sensitivity of 85.2%, specificity of 90.9%, and overall accuracy of 88.3%. These findings suggest that eFAST is reliable in detecting clinically significant injuries when performed early by trained clinicians. Similar results were reported by Ghafouri et al., while other studies such as Akoglu et al. showed lower sensitivity but similarly high specificity, indicating that operator skill and timing affect accuracy .

However, false-negative cases were seen in stable patients, showing that a negative eFAST does not completely exclude injury. Bowel injury, mesenteric trauma, retroperitoneal bleeding, and early hemoperitoneum may be missed initially. Studies by Netherton et al., Kim et al., and Yazıcı et al. also emphasized that eFAST is better for ruling in injury than ruling it out, and repeated scans improve sensitivity. Therefore, stable patients with strong clinical suspicion should undergo contrast-enhanced computed tomography even if eFAST is negative .

More than half of the patients were managed conservatively, while others required surgery or intervention

such as laparotomy or intercostal drain insertion. This shows that eFAST played an important role in treatment planning and triage. In unstable patients, immediate management was based on bedside assessment rather than computed tomography, highlighting the practical importance of eFAST in emergency trauma care .

Overall, the study shows that eFAST is a valuable first-line investigation in blunt abdominal trauma because it is rapid, reliable, and helps guide management decisions. Its main strength is high specificity, while its main limitation is the possibility of false-negative findings. Therefore, positive findings should be acted upon quickly, while negative findings in suspicious cases should be followed by repeat scanning or computed tomography for safe patient management

CONCLUSION

The present study shows that eFAST is a simple, quick, and reliable bedside tool for evaluating patients with blunt abdominal trauma. It provides rapid information during the initial assessment and helps in the early detection of important thoracoabdominal injuries such as hemoperitoneum, pneumothorax, and hemothorax. With good sensitivity, high specificity, and strong overall diagnostic accuracy, eFAST plays an important role in emergency decision-making and helps identify patients who need urgent surgical or interventional management while also supporting conservative treatment in stable cases.

Its greatest advantage is that it can be performed immediately at the bedside without delaying resuscitation, making it especially useful in emergency departments and resource-limited settings where quick decisions are critical.

However, a negative eFAST should not be taken as complete reassurance, particularly in stable patients where injuries such as bowel trauma, retroperitoneal bleeding, or small-volume hemoperitoneum may be missed. In such situations, clinical judgment remains essential, and further evaluation with repeat examination and contrast-enhanced computed tomography should be considered whenever suspicion persists.

Overall, eFAST should be viewed as an important first-line screening and triage tool rather than a replacement for full diagnostic workup. When used along with careful clinical assessment, it significantly improves early diagnosis, speeds up management decisions, and contributes to better outcomes in patients with blunt abdominal trauma.

REFERENCES

- Desai N, Harris T. Extended FAST. *BJA Educ.* 2018;18(2):57–62.
- Akoglu H, Celik OF, et al. Diagnostic accuracy of E-FAST. *Am J Emerg Med.* 2018;36(6):1014–7.
- Stanescu AL, Gross JA, Bittle M, Mann FA. Imaging of blunt abdominal trauma. *Semin Roentgenol.* 2006 Jul;41(3):196–208.
- Uri Adrian Prync Flato , Hélio Penna Guimarães, Renato Delascio Lopes, Jorge Luís Valiatti , Elias Marcos Silva Flato , Ricardo Gonçalves Lorenzo. Usefulness of E-FAST. *Rev Bras Ter Intensiva.* 2010; 22(3):291–299
- Kim TA, Kwon J, Kang BH. Accuracy of Focused Assessment with Sonography for Trauma (FAST) in Blunt Abdominal Trauma. *Emerg Med Int.* 2022 ;2022:8290339.
- Ghafouri HB, Zare M, Bazrafshan A, Modirian E, Farahmand S, Abazarian N. Diagnostic accuracy of emergency-performed focused assessment with sonography for trauma (FAST) in blunt abdominal trauma. *Electron Physician.* 2016 Sep 20;8(9):2950–2953.
- Akoglu H, Celik OF, Celik A, Ergelen R, Onur O, Denizbasi A. Diagnostic accuracy of the Extended Focused Abdominal Sonography for Trauma (E-FAST) performed by emergency physicians compared to CT. *Am J Emerg Med.* 2018 Jun;36(6):1014–1017.
- Yazıcı MM, Yavaş Ö, Çelik A, Altuntaş G, Altuntaş M, Bilir Ö, Ersunan G. The role of repeated extended FAST in patients with stable blunt thoracoabdominal trauma. *Ulus Travma Acil Cerrahi Derg.* 2023 May;29(5):553–559.
- Planquart F, Marcaggi E, Blondonnet R, et al. Appropriateness of Initial Course of Action in the Management of Blunt Trauma Based on a Diagnostic Workup Including an Extended Ultrasonography Scan. *JAMA Netw Open.* 2022;5(12):e2245432.