

1 2 **“A comparative study of accuracy of FAST vs CECT abdomen in** 3 **blunt trauma abdomen patients with Solid Organ Injury”**

4 5 **ABSTRACT**

6 **Aim** -To compare the accuracy of FAST vs CECT abdomen in patients presenting
7 with blunt trauma abdomen with solid organ injuries. **Objectives** - To determine the
8 sensitivity and specificity of FAST and CECT abdomen in blunt trauma abdomen patients with
9 solid organ injuries and to evaluate the management of blunt trauma abdomen patients according
10 to FAST and CECT abdomen finding. **Material and Methodology** - 100 patients above 18 years
11 came to emergency /casualty of department of surgery of Dr BRAM Hospital Raipur with history
12 of blunt trauma to abdomen with positive clinical findings were investigated for FAST and
13 CECT abdomen. Data is collected prospectively from FAST scans and CECT scans conducted
14 in blunt trauma abdomen (BTA) patients. Outcome of treatment were analysed according to
15 FAST and CECT findings. **Result** – In this study, the most common age group affected were
16 between 26 -35 years of age in which 88 patients were male and 12 patients were female. Most
17 cases were due to road traffic accident followed by fall from height. Out of 100, organ injury was
18 detected in 88 patients by FAST and in 98 patients by CECT scan. 94 patients were managed
19 conservatively and 6 patients were managed by surgery. **Conclusion** - CECT is more accurate
20 than e-FAST in detecting abdominal injuries, offering higher sensitivity and specificity,
21 especially for minor injuries and retroperitoneal damage. While e-FAST is useful for initial
22 evaluation, CECT remains the gold standard for definitive diagnosis and management in blunt
23 trauma abdomen patients.

24 **INTRODUCTION**

25 Blunt abdominal trauma is a major cause of injury, primarily resulting from road traffic
26 accidents, which account for 75-80% of cases. Other causes include falls from height, assaults,
27 sports injuries, and bomb blasts. Despite its high frequency, blunt abdominal trauma is often
28 difficult to detect early, making it prone to misdiagnosis. Delays in diagnosis, inadequate
29 treatment, and associated injuries (such as head, thorax, and pelvic trauma) contribute to the high
30 morbidity and mortality rates.

31 The **Focused Assessment with Sonography for Trauma (FAST)** is a key diagnostic tool,
32 especially for hemodynamically unstable patients. According to the ATLS (Advanced Trauma
33 Life Support) protocol, FAST should be performed immediately after the primary survey. It is a
34 rapid, non-invasive procedure (taking only about 5 minutes) that identifies free fluid in the
35 abdomen, which can indicate internal bleeding. FAST has a high specificity (98-100%) and
36 accuracy (98-99%) for detecting free fluid and significantly reduces the time needed for
37 diagnosis and intervention. Additionally, it is safe for pregnant women and children and can be
38 performed serially without radiation or contrast agents. Despite these advantages, FAST has
39 limitations. It has lower sensitivity (73-88%) for detecting peritoneal fluid and is not effective in
40 detecting retroperitoneal fluid or organ lesions. Its accuracy can be affected by factors such as
41 the operator's skill and difficulty in obese patients.

42 **CT scans**, considered the gold standard for diagnosing blunt abdominal trauma, can provide
43 more detailed information and detect organ injuries and retroperitoneal fluid. However, CT has
44 its own drawbacks, including potential artifacts due to patient movement, risk of renal toxicity,
45 radiation exposure, and higher costs compared to FAST.

46 In summary, while FAST is a valuable tool for rapid diagnosis, its limitations make CT the
47 preferred imaging modality for detailed assessment, despite the associated risks.

48 **MATERIAL AND METHODOLOGY**

49 The current study is a **prospective analytical study** conducted from **February 2023 to April**
50 **2024** in the **Department of General Surgery at Dr. B.R.A.M. Hospital and Pt. J.N.M.**
51 **Medical College**, Raipur. The study lasted for **one year and two months**.

52 **Study type** - Prospective analytical study.

53 **Study Site** - Department of General Surgery, Dr. B.R.A.M. Hospital, Raipur.

54 **Study Population:** Patients who met the inclusion criteria for blunt abdominal trauma.

55 **Sample Size:** 100 patients.

56 **Inclusion Criteria:** all patients Over 18 years of age presenting to the emergency department
57 with a history of blunt trauma abdomen and solid organ injuries.

58 **Exclusion Criteria:** Patients showing obvious signs of hollow viscus injury, Patients who
59 refused to consent for participation and hemodynamically unstable patients who could not
60 undergo CECT.

61 **Methodology:** The study received clearance from the Institute of Scientific Committee and
62 Ethical Committee and conducted in Dr BRAM Hospital and Pt. J.N.M. Medical College,
63 Raipur. Prior to the study, detailed explanations of the study methodology and interventions were
64 provided to patients and their attendants. Consent was taken, and queries were addressed.
65 Hemodynamically unstable patients received resuscitation, including airway management,
66 normal breathing, and maintenance of adequate blood pressure and saturation. These patients
67 were then sent for **FAST** (Focused Assessment with Sonography for Trauma) and **CECT**
68 (Contrast-Enhanced Computed Tomography) examinations. Patients requiring surgical
69 intervention were taken for **exploratory laparotomy**. Patients who did not require surgery were
70 managed conservatively in the **ICU**, with strict immobilization for 3-4 days.

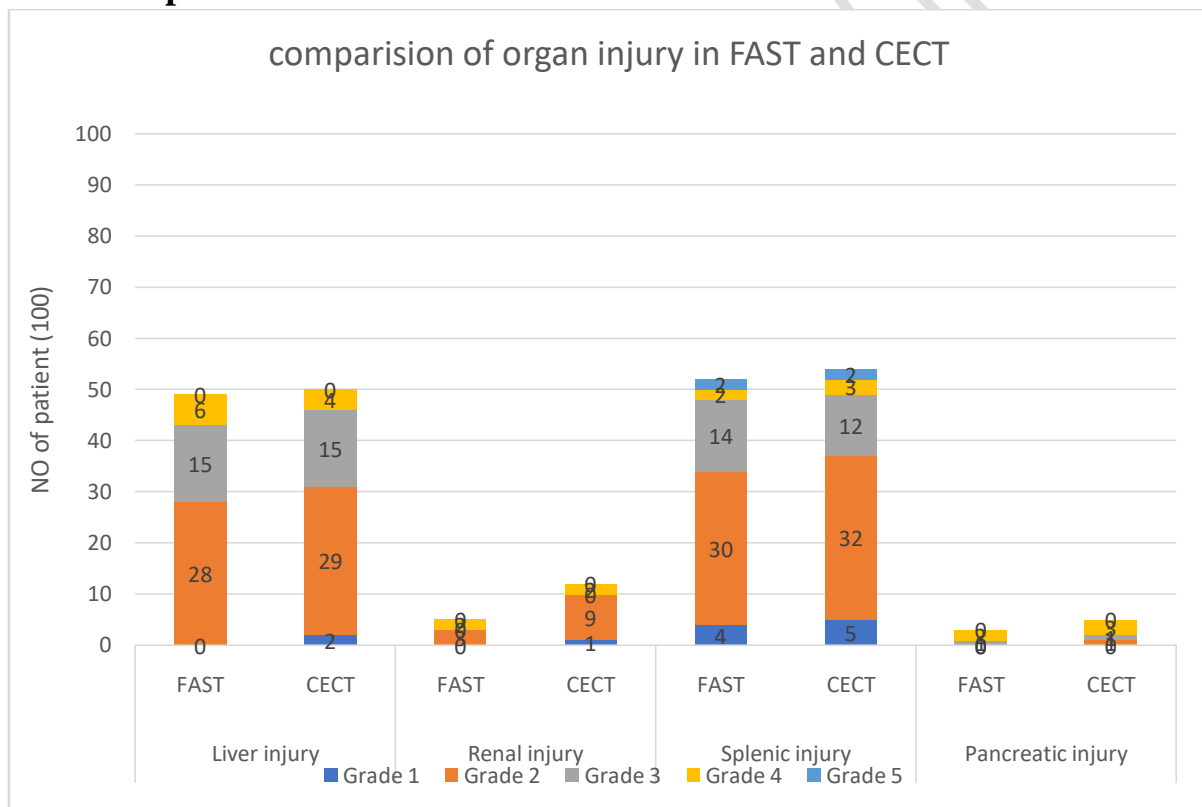
71 **RESULTS AND OBSERVATIONS**

72 Out of 100, CECT detected 98 cases of organ injury, while FAST detected 88. This suggests that
73 CECT is slightly more sensitive at identifying organ injuries than FAST. CECT has a
74 significantly higher detection rate for organ injuries compared to FAST. Only 2 missed cases for
75 CECT compared to 12 for FAST further highlights the higher sensitivity of CECT. Table 1
76 compares the severity of organ injuries detected using FAST and CECT in blunt trauma abdomen
77 patients. CECT has a more comprehensive detection rate, especially for retroperitoneal
78 collections and injuries like renal and pancreatic injuries.

79 **Table 1: Comparison of organ injury in FAST and CECT in blunt trauma**
 80 **abdomen patients.**

Variable	Liver injury		Renal injury		Splenic injury		Pancreatic injury	
	FAST	CECT	FAST	CECT	FAST	CECT	FAST	CECT
Grade 1	0	2	0	1	4	5	0	0
Grade 2	28	29	3	9	30	32	0	1
Grade 3	15	15	0	0	14	12	1	1
Grade 4	6	4	2	2	2	3	2	3
Grade 5	0	0	0	0	2	2	0	0
TOTAL	49	50	5	12	52	54	3	5

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 82 **Graph 1: Comparison of organ injury in FAST and CECT in blunt trauma**
 83 **abdomen patients.**



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 86 **Table 2: COMPARISON OF FAST AND CECT FINDINGS IN BLUNT**
 87 **TRAUMA ABDOMEN PATIENTS.**

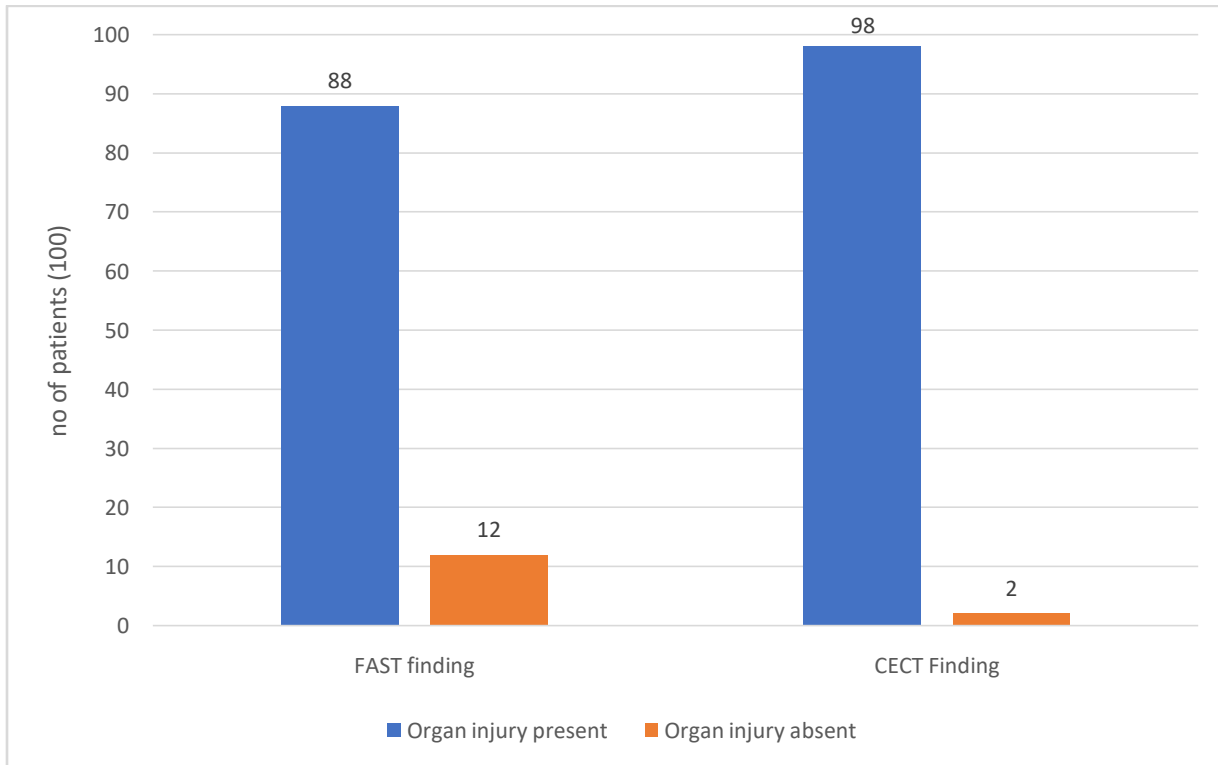
Variable	FAST finding	CECT Finding
Organ injury present	88	98

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Organ injury absent	12	2
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Graph 2: Comparison of FAST and CECT findings in blunt trauma abdomen patients.



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This data shows FAST detected organ injury in 88 patients while 12 were missed and in CT, 98 patients were detected with organ injury and only 2 were missed.

Table 3: Sensitivity of CT Scan.

	CECT finding		Total
	Organ injury present	Organ injury absent	

FAST Findings	Organ injury present	87	1	88
	Organ injury absent	11	1	12
	Total	98	2	100

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106 Sensitivity -88.78%, Specificity 50.00%, PPV-98.86%, NPP-8.33% p-value is
107 0.006.

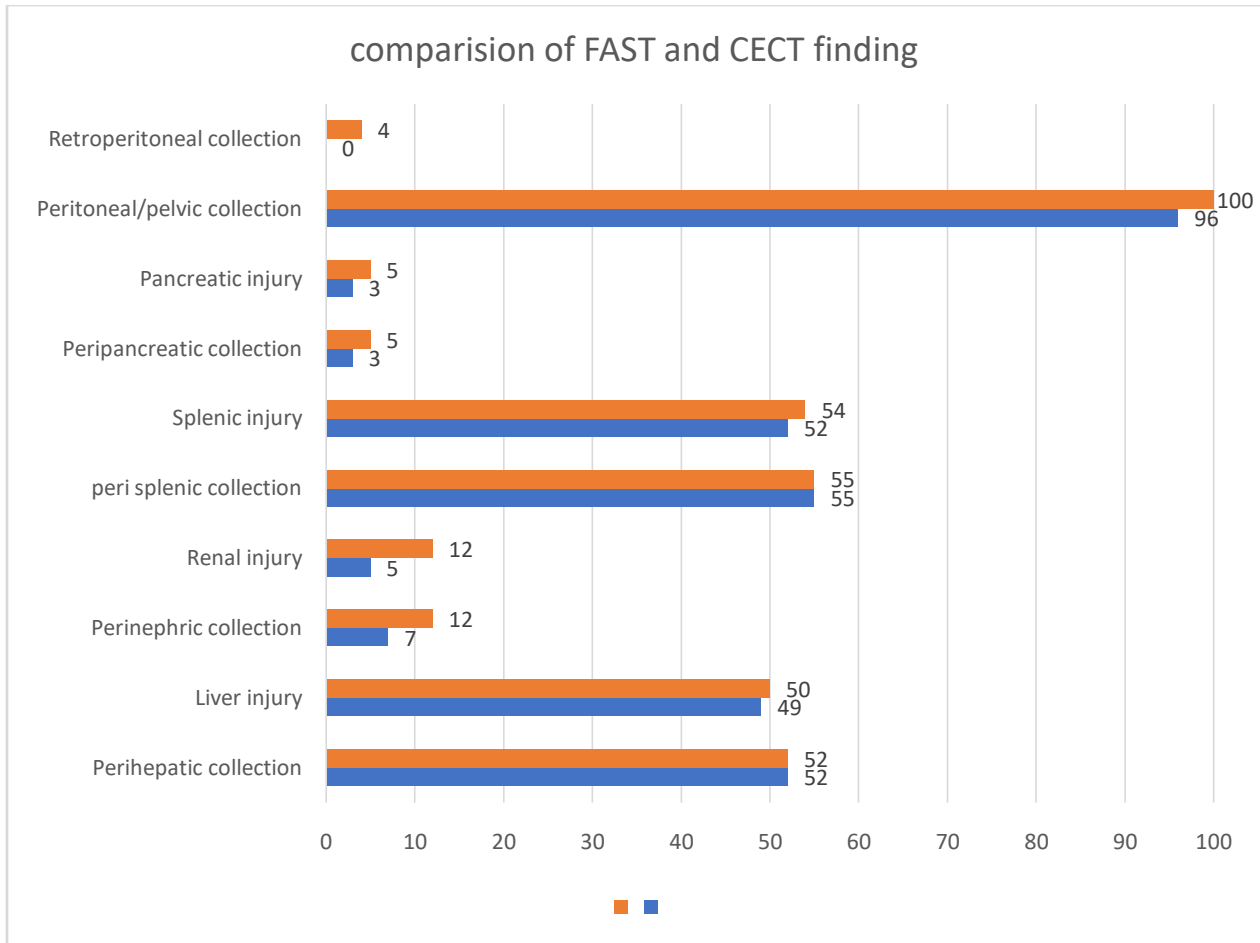
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Table 4: e-FAST and CECT findings in blunt trauma abdomen patients.

Variable	e-FAST	CECT
Perihepatic collection	52	52
Liver injury	49	50
Perinephric collection	7	12
Renal injury	5	12
peri splenic collection	55	55
Splenic injury	52	54
Peripancreatic collection	3	5
Pancreatic injury	3	5
Peritoneal/pelvic collection	96	100
Retroperitoneal collection	0	4

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Graph 3: e-FAST and CECT findings in blunt trauma abdomen patients.



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119 **DISCUSSION**

120 This study compares the accuracy of e-FAST (Focused Assessment with Sonography for
 121 Trauma) and CECT (Contrast-Enhanced Computed Tomography) in diagnosing blunt trauma
 122 abdomen injuries. Most patients were young males (18-35 years) involved in road traffic
 123 accidents. X-rays, e-FAST, and CECT were used to detect associated injuries. e-FAST was
 124 effective in identifying peritoneal fluid in 96% of cases, while CECT identified fluid in all
 125 patients, including cases missed by e-FAST. CECT also detected more organ injuries (98 vs. 88
 126 cases), including mild liver and renal injuries and retroperitoneal injuries not visible on e-FAST.
 127 Most patients (94%) were managed conservatively, with 6% requiring surgery. The length of
 128 stay varied based on injury severity, and there were 3 deaths due to associated injuries.

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131 CONCLUSION

132 CECT is more accurate than e-FAST in detecting abdominal injuries, offering higher sensitivity
133 and specificity, especially for minor injuries and retroperitoneal damage. While e-FAST is useful
134 for initial evaluation, CECT remains the gold standard for definitive diagnosis and management
135 in blunt trauma abdomen patients.

136 LIMITATIONS

- 137 • Sample size was small which is insufficient to provide comparative data for this type of
138 study.
- 139 • The study was done in a single center so hospital bias cannot be ruled out.
- 140 • Both diagnostic methods are observer-dependent.

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