

Comparative Study Between Focussed Assessment with Sonography for Trauma (FAST) and Diagnostic Peritoneal Lavage in Blunt Trauma Abdomen (DPL)

RANA SUHAIL, GHULAM MUAMMAD, IMRAN ASHRAF, MOHAMMAD ASHRAF, HUSNAIN HAIDER, KHALID JAVED ABID

Department of Surgery, King Edward Medical University/Mayo Hospital, Lahore

Correspondence to Dr. Ghulam Muhammad, Assistant Professor Surgery email: gmkemu@yahoo.com

ABSTRACT

Blunt abdominal trauma is a surgical emergency which challenges the diagnostic skill and efficiency of emergency surgeons. The objective was to compare the accuracy of focused assessment with sonography for trauma (FAST) and diagnostic peritoneal lavage (DPL) in detection of hemoperitoneum in blunt trauma abdomen. This cross-sectional comparative study was carried out from October 2007 to December 2007 in Accident & Emergency Department and West Surgical Ward, Mayo Hospital Lahore. Ninety patients with blunt abdominal trauma, divided into two procedural groups, 45 patients in each. Group I patients were FAST positive and group II patients were DPL positive. There were 83 positive and 7 negative laparotomies. In positive FAST group, there were 5 (11.1%) negative laparotomies. In positive DPL group, there were 2 (4.4%) negative laparotomies. This was statistically significant (<0.05). It is concluded that DPL is more accurate than FAST in assessment of patients of blunt trauma abdomen.

Key words: Blunt trauma abdomen, FAST, Ultrasound, DPL

INTRODUCTION

Abdomen is one of the most common and important regions in respect to trauma. Early diagnosis and treatment of abdominal injuries affects the prognosis of patients significantly. The management of abdominal injury has undergone marked changes during the years following the World War II. Mortality rates from this injury have fallen steadily and new diagnostic techniques have been described for rapid evaluation of blunt trauma abdomen. The distribution of injuries depends upon the lifestyle and the geographic and environmental factors of the study population.

Blunt abdominal trauma is a common surgical emergency which can cause injury to solid and hollow viscera.¹ It challenges the diagnostic skill and efficiency of emergency surgeons since negative laparotomy as well as missed visceral injuries are associated with significant morbidity and mortality.² The rapid assessment tools available to the trauma surgeon in the emergency setting are proper history, complete examination, Focused Assessment with Sonography for Trauma (FAST) and Diagnostic Peritoneal Lavage (DPL).^{2,3} FAST is rapid limited ultrasound examination directed at identifying the presence of free intraperitoneal or pericardial fluid.⁴ It is rapid, safe, non-invasive, portable, repeatable and cost-effective.^{5,6} DPL is the diagnostic sampling of peritoneal contents and carried out under local

anesthesia by either open or closed technique.⁷ Aspiration of blood or enteric contents constitutes a positive DPL and warrants an immediate laprotomy. It is a reliable indicator of hemoperitoneum and not only reduces the risk of late or missed diagnosis but also of negative laparotomy. The only absolute contraindication to DPL is an already planned laprotomy.⁸ In this study, we explore the role of FAST and DPL in blunt trauma abdomen patients before conducting a formal laparotomy, so that a better diagnostic aid may be incorporated in our routine practice.

Aims & objective: To compare the FAST and BPL in order to reduce the frequency of negative laparotomy.

PATIENTS AND METHODS

This cross-sectional comparative study was carried out in Accident & Emergency Department and West Surgical Ward, Mayo Hospital Lahore which is a teaching hospital attached with King Edward Medical University Lahore. The study period spans from October, 2007 to December, 2007. Patients having penetrating injury along with blunt trauma abdomen and pre-existing indication for laparotomy were excluded from the study. Group I patients underwent FAST while in Group II patients DPL was performed under local anaesthesia. FAST or DPL was conducted according to patient group. The findings

were noted and all positive FAST and positive DPL patients were proceeded for formal emergency laparotomy. Findings of laparotomy were documented for a positive laparotomy. The frequency of positive laparotomy after positive FAST and DPL was calculated and was compared by applying the chi-square test. P value <0.05 was considered as significant.

RESULTS

The two groups were compared in terms of positive and negative laparotomies, there were 83 positive and 7 negative laparotomies among the 90 patients that were studied. The negative laparotomy rate was 7.8%. In group I (positive FAST), there were 40 positive and 5 negative laparotomies with a negative laparotomy rate of 11.1%. In group II (positive DPL), there were 43 positive and 2 negative laparotomies and the negative laparotomy rate was 4.4% (Table 1).

After determining the frequencies and rates of positive and negative laparotomies, comparison of group I and group II was again carried out. Chi-square test was applied for positive laparotomies. Statistically the difference was significant [P<0.05] (Table 2).

Table 1: Comparison of positive and negative laparotomies in both groups

Group	+ve laparotomies (n = 45)		-ve laparotomies (n = 45)	
	=n	%age	=n	%age
I	40	88.9	5	11.1
II	43	95.6	2	4.4

Table 2: Comparison of positive laparotomies in group I and group II

Mechanism of injury	Group I (n = 45)	Group II (n = 45)
Road traffic accident	20	23
Fall	7	14
Assault	8	5
Others	2	3

$\chi^2 = 7.23, df = 1, P = 0.000$

DISCUSSION

In this study, 90 patients were studied. There was highest incidence i.e. 38.9% (35 out of 90) of blunt trauma abdomen was in the 26-35 year age group and 64.4% (58 out of 90) were below 35 years of age. Siddique et al⁹ reported 52% incidence in the age group 21-30 years. In this study, the mean age was 35.43 years. Jehangir et al¹⁰ reported mean age of 34.2 years in their study of 56 patients. In this series, male patients were 58.9% while Jehangir et al¹⁰ reported 76.7% male patients and Siddique et al⁹

reported 94% male patients. This reflects the lifestyle differences seen in the different regions where the studies were carried out.

In this series, 90 patients underwent laparotomies of which there were 83 positive and 7 negative laparotomies with a negative laparotomy rate of 7.8%. In group I (positive FAST), there were 11.1% negative laparotomies [false positive FAST] (Table 1) The study done by Amer et al⁸, there were 4% false positive FAST and 6% false positive DPL. While Jehangir et al¹⁰ reported no false positive findings on FAST. However, in the series of 60 patients studied by Shiryazdi et al¹¹, 52.3% of all positive FAST turned out to be false positive. The studies mentioned above indicate that FAST cannot be endorsed as the sole diagnostic test in patients of blunt trauma abdomen requiring critical decisions during emergency management. Before initiation of FAST as a routine in emergency departments, proper training of FAST should be instituted. In group II of the present study which comprised of positive DPL cases, there were 4.4% false positive DPL. In the study by Amer at al which compared the results of FAST and DPL for assessment of blunt trauma abdomen, there were 6% false positive DPL.⁸

There are many reports that state that due to availability of non-invasive modalities, DPL should be of historical value only. However, in the present study, it has been seen that DPL is a more accurate diagnostic modality than FAST in the assessment of blunt abdominal trauma (as per statistical significance: p value < 0.05). Thus it is reasonable to state that despite advancement of radiological diagnostic modalities like US and CT scan, DPL has not lost its value.

CONCLUSION

Although FAST is a non-invasive modality, but it is operator dependent and has more false positive results. DPL has good yield in diagnosis of blunt trauma abdomen and false positivity is less.

REFERENCES

1. Sivit CJ. Contemporary imaging in abdominal emergencies. *Pediatr Radiol* 2008; 38: 675-8.
2. Pathan A. Role of ultrasound in the evaluation of blunt abdominal trauma. *JLUMHS* 2005; 4: 23-8.
3. Khan MR, Ejaz K. Surgical management of blunt pancreatic trauma: A modus operandi or individualized therapy? *J Pak Med Assoc* 2008; 58: 638-40.
4. Radwan MM, Abu-Zidan FM. Focussed Assessment Sonographic Trauma (FAST) and CT scan in blunt abdominal trauma: surgeon's perspective. *African Health Sciences* 2006; 6: 187-90.

5. Abu-Zidan FM, Dittrich K, Czechowski J, Kazzam E. Establishment of a "Focused Assessment Sonography for Trauma" (FAST) Course. Saudi Med J. 2005; 26: 806-11.
6. Leung E, Wong L, Taylor J. Non-operative management for blunt splenic trauma in children: An updated literature review. Surgical Practice 2007; 11: 29-35
7. Whitehouse JS, Weigelt JA. Diagnostic peritoneal lavage: a review of indications, technique, and interpretation. Scand J Trauma Resusc Emerg Med 2009; 17: 13-7.
8. Amer MS, Ashraf M. Role of FAST and DPL in assessment of blunt abdominal trauma. Professional Med J 2008; 15: 200-4.
9. Siddique MA, Rahman MK, Hannan ABMA. Study on abdominal injury: an analysis of 50 cases. TAJ 2004; 17: 84-8.
10. Jehangir B, Bhat AH, Nazir A. The role of ultrasonography in blunt abdominal trauma: a retrospective study. JK Practitioner 2003; 10: 118-9.
11. Shiryazdi M, Modir A. Study of the Diagnostic Value of Ultra Sonography in Blunt Abdominal Traumas. Pak J Med Res 2005; 44: 130-2.