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Original Research

To evaluate the efficacy of abdominal paracentesis as diagnostic tool for acute abdominal conditions

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***ABSTRACT*:**
Background - The diagnosis of acute surgical conditions of abdomen is in many instances challenging and complex. In these circumstances, abdominal paracentesis becomes useful and carries immense value. So aim of the study is to evaluate the efficacy of abdominal paracentesis as a simple, bedside and accurate diagnostic tool for acute abdominal conditions. **Material and method** - 60 patients with acute abdomen admitted to Emergency Surgery Department of Rajindra Hospital, Patiala were taken for study. **Results:** In present study we found, sensitivity of the abdominal paracentesis as an aid for diagnosing cause of acute abdomen was 89.65%, specificity was found to be 100%, PPV was 100%, NPV of 20% and accuracy of 90%. **Conclusion:** Diagnostic paracentesis is an extremely reliable aid in diagnosing patients with suspected intra-peritoneal haemorrhage and visceral perforation.
Key words: Paracentesis, Peritoneal, distension, tenderness, auscultation.

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INTRODUCTION

Acute abdominal pain constitutes a significant percentage of emergency admissions worldwide and comprises the largest group (non-traumatic) of people presenting as general surgical emergency.[1] The diagnosis of acute surgical conditions of abdomen is in many instances challenging and complex.

The problem becomes more baffling when 24 h services of radiology and laboratory are not available. In these circumstances, abdominal paracentesis becomes useful and carries immense value.[2] Paracentesis is a technique in which the peritoneal cavity is punctured by a needle to aspirate peritoneal fluid[3]. Paracentesis helps in determining the etiology of the ascites and the presence of infection. Solomon was the first person to describe the technique of abdominal paracentesis in 1906.[4]Although the first documented study done was carried out by Neuhof and Cohen who explained about the use of it as a diagnostic tool.[5]Peritoneal paracentesis is a safe procedure even in cases of intestinal obstruction where there is chance of puncturing the bowel.[6] Aim of present study was to evaluate the efficacy of abdominal paracentesis as a simple, bedside and accurate diagnostic tool for acute abdominal conditions.

MATERIALS AND METHODS

A total of 60 patients with acute abdomen admitted to Emergency Surgery department of Rajindra Hospital, Patiala were taken for study considering the inclusion and exclusion criteria. All patients who presented with features of acute abdomen including both traumatic and non-traumatic causes and post-operative cases were included for study and those who gave consent for the study. Patients below the age of 12 years, extensive abdominal scar, renal or ureteric calculi, diagnosed coagulation disorders, not gave consent for study were excluded Complete history was taken ,Vital signs were

recorded, Thorough clinical examination was done. Routine blood investigations, X-rays abdomen, USG abdomen and pelvis and CT was done.
The material required for paracentesis were -Sterile gloves, 10% betadine solution, 20 gauze small spinal needle, 10 cc syringe, 2% lignocaine

In the present study positive tap was when 0.5ml or more amount of fluid could be aspirated. We had 52(86.67%) patients who had positive tap in our study. Negative fluid was defined as in when there was no fluid could be aspirated or a less than 0.5 ml of aspirated after aspirating all the four quadrants of abdomen. We had 8 (13.33%) patients with negative tap in our study.

RESULTS

Tap	Positive		Negative	
	Patients	Percentage	Patients	Percentage
Peritoneal Tap	52	86.67%	8	13.33%

Table 1 - Result of diagnostic peritoneal tap in the study subjects

Initially the tap was performed in right lower quadrant, out of 60 patients 42 (70%) patients had positive taps in right lower quadrant itself. Then out of remaining 18, 7(11.67%) patients had positive taps in right upper quadrant, 2(3.33%) patients had positive tap in left upper quadrant and 1(1.67%) patient had a positive tap in left lower quadrant.

Quadrant of Aspirate	No. of Tap Performance	Positive	Negative
Right Lower Quadrant	60	42 (70%)	18 (30%)
Right Upper Quadrant	18	7 (11.67%)	11 (18.33%)
Left Upper Quadrant	11	2 (3.33%)	9 (15%)
Left Lower Quadrant	9	1 (1.67%)	8 (13.33%)

Table 2 -Comparison of site of positive tap in the study subjects

In the present study, we could aspirate the characteristic fluid in 52 patients. Most common type was purulent (26.67%) followed by bilious and feculent each being 15 (25%) followed by haemorrhagic aspirate in 6 (10%). 8 (13.33%) patients had negative TAP

Peritoneal Tap	Patients	Percentage
Bilious	15	25%
Feculent	15	25%
Haemorrhagic	6	10%
Purulent	16	26.67%
Negative	8	13.33%
Total	60	100%

Table 3 -Nature of aspirated tap in the study group

In our study of 52 positive peritoneal tap group each patient were subjected to laparotomy and intra-operative finding was found to be correlated to the finding of pre-operative paracentesis. Out of 8 negative tap, surgery was done in 6 patients based on clinical and radiological investigation and surgery revealed intra- abdominal pathology. Remaining 2 patients managed conservatively without surgery.

Tap	Surgery finding	Patients	Percentage
Positive Tap (n=52)	Finding Conformed on surgery	52	100%
	Finding not confirmed on surgery	0	0%
Negative Tap (n=8)	Finding Conformed on surgery	6	75%
	No Procedure Done	2	25%

Table 4 - Relationship of tap and laparotomy in the study

Statistical Analysis - Sensitivity: 89.65%, Specificity: 100.00%**,** Positive Predictive value: 100.00%**,** Negative Predictive value: 20.00%**,** Accuracy: 90%

DISCUSSION

Many authors have emphasized the importance of use of diagnostic abdominal paracentesis for cases of acute abdomen due to traumatic and non-traumatic causes. In our present study we did diagnostic abdominal paracentesis on 60 patients presented to us as case of acute abdomen**.**

We had positive tap in 52(86.67%) patients of the total 60 patients. This Tap rate is closely related to observation made by other studies as in 1960, Giacobine and Siler[7] did an experimental study and showed that a volume of at least 500 ml of free fluid in the peritoneal cavity will give a 78% positive paracentesis rate, thus method is likely to be more sensitive and accurate than any other single diagnostic method.

We had 52 patients of non-traumatic acute abdomen in our study, out of these 52 there were 40 patients who had some hollow viscous perforation. We had 100% true positive tap in these patients i.e. in all 40 patients peritoneal tap was consistent with intra-operative finding, high accuracy of 100% by Bhatnagar V[8] was possibly due to the late presentation of patients to the hospital. Most of the patients presented to our emergency department on 2nd or 3rd day after onset of symptoms.

Analysing the nature of aspirate grossly is of extreme importance in order to predict the site of perforation. In our study, we found that all 12 patients with gastro-duodenal perforations had bilious coloured aspirate and as we went distally in gut the aspirate became purulent and feculent seen in patients with illeal perforation and colonic perforation.

Fernando, et al[2] observed that of the 15 gastro-duodenal perforations, 11(73.33%) were bilious and 04(26.67%) were purulent fluid with flakes. Channadasar S et al[9] found that of the 25 gastro-duodenal perforation 22(88%) were bilious , 2(8%)were purulent and in one(4%) case they could not aspirate any fluid. In our study, we got positive TAP most frequently (70%) on right lower quadrant of abdomen itself. In a patient with ascending colon perforation we got positive TAP from right upper quadrant.

Out of 2 patients of mesenteric tear, we got positive tap from right lower quadrant in 1 patient and in other patient from left lower quadrant. Thus we observes that site of paracentesis does not necessary indicate the probable site of the lesion. This has also been observation of Giacobine J. N[7] and Baker W. N.[10]

Present study had accuracy for diagnostic paracentesis of 90% which is comparable to the study conducted by Lamke L.O [11] who also had accuracy of 90% in his study, Higher accuracy of 93.75% was seen in the study conducted by Fernando[2]. Thus high index of accuracy has also been observed by other authors also. So the results of present study were comparable with previous studies.

CONCLUSION

We conclude that diagnostic paracentesis is an extremely reliable aid in diagnosing patients with suspected intra-peritoneal haemorrhage and visceral perforation, but has little place in the diagnosis of localized intra-abdominal inflammatory disease . Only drawback that we conclude regarding diagnostic paracentesis TAP, is that negative TAP does not excluded a pathology. It is concluded that applying diagnostic paracentesis more frequently can improve the surgical care of patients with acute abdomen.

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