PERCUTANEOUS NEEDLE PERITONEAL BIOPSY IN THE DIAGNOSIS OF EXUDATIVE ASCITES

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Background: Percutaneous needle peritoneal biopsy in diagnosis of exudative ascites has gained wide acceptance and many workers have utilized it with a high diagnostic yield and no significant complications. Present study has been carried out to determine the efficacy of percutaneous needle peritoneal biopsy in the diagnosis of exudative ascites of unknown aetiology. **Methods:** It is a descriptive case study conducted in Medical 'C' Unit, Lady Reading Hospital, Postgraduate Medical Institute, Khyber Medical University Peshawar over a period of 2 years, i.e., from Nov, 2003 to December 2005. A total of 45 patients having unexplained exudative ascites underwent blind needle peritoneal biopsy. The biopsy specimen was subjected to histopathology. Ascitic fluid was also obtained for analysis. Post biopsy patients were observed for 24 hours for any untoward complications. **Results:** A total of 45 patients (17 male and 28 female) with age range from 20 to 65 years and having exudative ascites were studied. The commonest presentation of our patients was abdominal distension (93.3%), pain abdomen (46.67%), fever (44.4%) and weight loss (33.3%). Histopathology of the peritoneal biopsies was reported as follows. Eighteen cases (40%) showed non specific chronic inflammation, 10 (22.2%) cases showed caseating granulomatous inflammation suggestive of tuberculosis and 6 (13.3%) cases showed metastatic adenocarcinoma. In one patient peritoneal mesothelioma was reported. In the remaining10 patients (22.2%) biopsies were either non representative or inconclusive. The ascitic fluid showed predominantly lymphocytes in 86.6% of cases. Only three patients were reported to be having atypical cells on fluid cytology. The procedure was found safe. No patient was lost due to complications related to the procedure. Only one patient had evidence of intra peritoneal bleed. The commonest problem post biopsy was pain (91.1%) and mild swelling (53.3%) at biopsy site. **Conclusion:** Peritoneal biopsy is fairly safe and inexpensive procedure with good diagnostic efficacy in patients with undiagnosed exudative ascites.

Keywords: Peritoneal biopsy, Diagnosis, Exudative ascites

INTRODUCTION

Peritoneal biopsy was fist performed by Donohue *et al* using a modified vim Silverman needle.[1] Later Abrams and Cope needles were used.[2] In 1967 Levine performed this procedure on 36 patients and diagnosed tuberculosis in 20 with no false negative results.[3] Since then the procedure has gained acceptance and many workers have utilized it with a high diagnostic yield and no significant complications.[4,5]

The term 'ascites' denotes pathologic accumulation of fluid in the peritoneal cavity. Healthy men have minimal or no intraperitoneal fluid while women normally may have up to 20 ml of fluid.[6] Ascites is traditionally classified as exudative or transudative on the basis of the protein content and specific gravity of the fluid. It is exudative when protein content is more then 25 g/L. Exudative ascites is usually due to peritoneal disease caused by infection like tuberculosis or tumour.[7] Exudative ascites should give rise to clinical suspicion of tuberculous peritonitis in endemic areas or in immigrants from endemic areas.[8] Tuberculous peritonitis is best diagnosed by peritoneal biopsy, either percutanously or via laparoscopy. Similarly, the diagnosis of peritoneal seeding by tumour can be made by peritoneal biopsy if cytologic analysis of ascitic fluid is negative.[7] Laparoscopy and peritoneoscopy with peritoneal biopsy has a high diagnostic yield and is a cost-effective technique. It is the most sensitive and specific diagnostic method.[9] Needle peritoneal biopsy is also an important procedure to diagnose peritoneal tuberculosis and to avoid unnecessary laparotomies.[10] Empirical anti-tuberculous treatment is justified in some patients with clinical and histological features highly suggestive of peritoneal tuberculosis, even in cases with negative results from microscopy, culture and PCR analysis.[11,12]

Due to lack of laparoscopic facilities in many hospitals of our country and the technical knowledge limited to specialized centres, patients with exudative ascites become a diagnostic dilemma. In such situation, needle peritoneal biopsy becomes an important diagnostic procedure for a conclusive diagnosis. It requires minimal tools and very little technical expertise.

The aim of the present study is to evaluate the diagnostic utility of needle peritoneal biopsy in patients with un-explained exudative ascites

PATIENTS AND METHODS

This descriptive case study was conducted in Medical 'C' Unit, Lady Reading Hospital, Postgraduate Medical Institute, Khyber Medical University Peshawar over a period of 2 years, i.e., from Nov, 2003 to December 2005. Forty-five patients of both sexes (Male=17, Female=28) were studied. Histories were recorded and all patients examined thoroughly. The patients' data were entered in a pre designed proforma for analysis.

All patients with undiagnosed exudative ascites were included in the study. Patients with bleeding diathesis or having evidence of acute peritonitis were excluded from the study. Patients who had a signs of intestinal obstruction requiring surgical intervention were also excluded. Patients with overt or diagnosed malignancy or tuberculosis on the basis of other evidence and having exudative ascites were also excluded from the study.

Base line investigations including full blood count, ESR, Blood urea, sugar, urine R/E, Liver function tests and X-rays Chest were done in all cases. Patients were also screened for HBS Ag and anti HCV. Abdominal Ultra Sound was performed in all cases for confirmation of ascites and to identify a possible cause. Patients coagulation profile, and platelet counts was also checked prior to biopsy. Diagnostic aspiration of ascitic fluid was done and sample analysed in a standard way[7] for biochemistry, staining, cytology and aerobic culture.

Patients having unexplained exudative ascites, i.e., protein content more than 25 g/L underwent peritoneal biopsy. Before the procedure informed verbal consent was taken from the patients. During the procedure patients were asked to lie supine with one pillow under the head. Right lower quadrant of abdomen was selected for biopsy. It was cleaned and draped an injected with 2% Xylocain. It was infiltrated as for deep as the peritoneum. A small skin incision (0.5 Cm) was given with a disposable surgical blade. Abrams needle was pushed into the peritoneum with rotatory movement and fluid aspirated after reaching the peritoneal cavity. The needle was withdrawn as far as the abdominal wall, so as to engage the peritoneal surface. An assistant would sometimes push the abdominal wall against the needle tip to facilitate engagement of the peritoneam.[13] After this manoeuvre, the same steps followed as during a pleural biopsy and 2–3 pieces of peritoneum were obtained in multiple steps. Skin incision was closed with silk 2/0 and dressing done. Patients were advised lie on the left side and were observed in the ward for 24 hours. Pieces of biopsies were put in 10% formalin bottle, labelled and sent to the histopathology laboratory. Patients were advised to remove the stitch after 5–7 days.

RESULTS

A total of 45 patients were subjected to peritoneal biopsy of which 17 were male and 28 female, with male to female ratio: 1:1.64. The age range was 20–65 years with Mean age±SD (42.8±16.3) years.

The commonest presentation of our patients was abdominal swelling (93.3%), pain abdomen (46.67%), fever (44.4%) and weight loss (33.3%).

Biopsy specimen was obtained in all 45 cases. Eighteen (40%) cases showed non specific chronic inflammation, 10 (22.2%) cases showed caseating granulomatous inflammation suggestive of tuberculosis and 6 (13.3%) cases showed metastatic adenocarcinoma. In one patient (2.2%) peritoneal mesothelioma was reported. The peritoneal biopsy revealed specific diagnosis in 17 cases (37.7%) while it showed non specific chronic inflammation in additional 18 patients (40%). In the remaining 10 patients (22.2%) biopsies were either non representative or inconclusive. Ascitic fluid showed predominantly lymphocytes in most of the cases (86.6%).Only three patients were reported to be having atypical cells on fluid cytology. Acid-fast bacilli could not be demonstrated in any patient.

Table-1: Showing clinical presentation of patients

Clinical Presentation.	Number	%
Abdominal distension	42	93.33
Abdominal pain	21	46.67
Fever	20	44.44
Anorexia & weight loss	15	33.3
Night Sweats	5	11.1
Diarrhoea	2	4.4
Constipation	2	4.4
Pleural Effusion	2	4.4
Peripheral oedema	3	6.6

Table-2: Peritoneal fluid cytology

Type of cells	Number	%
Lymphocytes predominant	39	86.6
Neutrophil predominant	3	6.67
Atypical/Malignant cells	3	6.67
Total	45	

Table-3: Peritoneal biopsy findings

Histological findings	Number	%
Non specific chronic inflammation	18	40
Caseating granulomatous inflammation	10	22.2
Metastatic adenocarcinoma.	6	13.3
Peritoneal mesothelioma	1	2.22
Non representative or inconclusive	10	22.2
Total	45	100

The procedure was found safe. No patient was lost due to complications related to the procedure. Only one patient had evidence of intra peritoneal bleed as suggested by tachycardia and fall in haematocrit. She was managed successfully with blood transfusion. The commonest problem post biopsy was pain (91.1%) and mild swelling (53.3%) at biopsy site. This would normally settle down in 2–3 days time with symptomatic treatment. Seven (15.5%) cases had slight ooze at the site of biopsy that settled with conservative management. No patient had evidence of secondary infection.

Table-4: Showing complications of peritoneal biopsy

Complication	Number	%
Pain	41	91.1
Swelling	24	53.3
Ascitic fluid ooze	7	15.5
Intra-peritoneal Bleeding	1	2.22

DISCUSSION

The study showed that a conclusive tissue diagnosis was possible with peritoneal biopsy in 37.7% cases with exudative ascites, in whom otherwise; a more traumatic

procedure would have been required. This is lower diagnostic yield as compared to earlier study from our area.[5] We had more patients (40%) having chronic non specific inflammation. In other cases (22.2%) the biopsy showed normal peritoneum or did not reveal any peritoneal tissue. Negative biopsy was more as compared to 14% in the above mentioned study. It is possible that that some patients with peritoneal disease were not picked up due to blind nature of the procedure. This might have led to more case being labelled as chronic non specific inflammation. The technique of direct visualization and obtaining peritoneal biopsy samples using laparoscopic technique is more helpful in elucidating the cause of low serum ascites albumin gradient (SAAG) ascites.[14] The histopathological diagnosis was made possible in all except one case in that study.

In 10 out of 45 cases (22.2%), caseating granulomatous inflammation suggestive of tuberculosis was reported. In these cases a bacteriological diagnosis is mostly inconclusive and culture studies require a period of 4 to 6 weeks. Image guided percutaneous peritoneal biopsy is reported to be a sufficient, safe and inexpensive method for diagnosis of peritoneal tuberculosis.[15]

Atypical cells were seen in three of our patient fluid cytology whereas metastatic adenocarcinomas was reported in 6 (13.3%) of the peritoneal biopsies. This is lower figure as compared to earlier study[5] possibly again due to blind nature of procedure. Peritoneal mesothelioma was diagnosed in only one patient without pleural mesothelioma. Malignant peritoneal mesotheliomas are rare tumours arising from the peritoneal surface.[16]

The commonest presentation of our patients was abdominal swelling (93.3%), pain abdomen (46.67%), fever (44.4%) and weight loss (33.3%). Similar presentation has been reported by other workers.[15,17] Although the referenced studies included only patients with abdominal tuberculosis.

The procedure was found to be very safe and simple to perform on bed side without the need of sophisticated and expensive instruments. No patient was lost due to the procedure. Only one patient had evidence of intra peritoneal bleed as suggested by tachycardia and fall in haematocrit.

This is a small study with certain limitations. The biopsy was done by different operators some of them were not very experienced. Also the biopsy specimen was reported by three laboratories on different occasion. This might have dampened the diagnostic yield of the procedure. The study however showed that conclusive tissue diagnosis was possible in 37.7% cases, in whom otherwise; a more traumatic procedure would have been required.

CONCLUSION

Percutaneous peritoneal biopsy is a useful diagnostic modality in situation where facilities for laparoscopy are not available in elucidating the cause of unexplained exudative ascites. We believe an aggressive diagnostic approach, including peritoneal biopsy, is warranted for the diagnosis and timely treatment of tuberculous peritonitis

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