

Role of Laparoscopy in the diagnosis of Low Serum Ascites Albumin Gradient

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Abstract

The objective is to determine causes of low serum ascites albumin gradient (SAAG) by direct visualization and obtaining biopsy samples using laparoscopic technique. This is a hospital-based, observational study conducted at Department of Gastroenterology, Sheikh Zayed Hospital, Lahore from January 2001 to April 2002. A total of 33 patients with ascites (SAAG < 1.1 g/dl) were selected. The findings on history and clinical examination, information from laboratory and radiological investigations were recorded. Laparoscopic findings and histological reporting were correlated. The mean ages were 48.38 ± 16.7 years. Fifteen (45%) patients were male. The mean duration of the presenting complaints was 3.33 ± 1.9 months. Ascites was present in all with mean SAAG of 0.73 ± 0.22 . Laparoscopic evaluation showed tuberculous peritonitis in 22 (66.7%) patients and carcinomatous peritonitis in 5 (15.2%) patients. Biopsies were obtained from omentum in 20, peritoneal surface in 5 and liver in 12 patients.

The histopathological diagnosis was granulomatous inflammation in 20 (60.6%) and diagnosis of malignancy was made in 7 (21.2%); one (3%) had Budd Chiari Syndrome, 4 (12%) had cirrhosis of liver with super-added Hepatocellular carcinoma and biopsy was non-conclusive in 1 patient. No complication of procedure occurred in this cohort.

Laparoscopy is a safe diagnostic modality to establish the cause of low SAAG ascites.

Introduction

Ascites is the pathologic accumulation of free fluid within the abdominal cavity. There are several causes of ascites i.e. ascites due to portal hypertension, tuberculosis, malignancy, nephrotic syndrome, heart failure, pancreatic and biliary pathology, SLE, myxoedema, Meig's syndrome and last but not the least Budd Chiari syndrome.

Ascites is diagnosed on history, clinical examination, and abdominal ultrasonography. Ascitic fluid examination for microbiology, biochemistry and culture sensitivity will usually lead to definitive treatment. Ascitic fluid was classified according to total protein content of the fluid into transudative and exudative ascites.¹⁻² Ascites is further classified according to serum ascites albumin concentration gra-

dient (SAAG) into high gradient ≤ 1.1 g/dl or low SAAG ascites, ≤ 1.1 g/dl. SAAG is 99% accurate in determining type of ascites due to portal hypertension.³

Diagnostic laparoscopy is a cost effective procedure with overall accuracy of 97%⁴ as lesions are seen under direct vision with magnification. Lesions less than 1 mm can be identified. Moreover, directed biopsies can be obtained with very low risk of complications. As diagnostic laparoscopy is an invasive procedure there are certain complications reported with this procedure i.e. haemorrhage, perforation, and air embolism.^{4,5}

Diagnostic laparoscopy is indicated for accurate diagnosis of ascites when abdominal ultrasonography, CT abdomen⁶ and diagnostic paracentesis have failed to determine the cause of ascites.² Laparoscopy is very sensitive for small malignant or benign peritoneal implants. If size of the peritoneal nodules is uniform these are more likely to be benign because in malignant peritoneal spread the nodules are of varying sizes.^{7,8}

Laparoscopic biopsy of these peritoneal implants can be obtained and sent for histopathological diagnosis.⁹ Other accepted indications of diagnostic laparoscopy are the assessment of liver and acute abdominal pain.³⁻⁴ The objective was to determine the cause of low serum ascites albumin gradient by laparoscopy and biopsy.

Patients, Methods and Results

Thirty three patients with low SAAG ascites were selected for laparoscopy. Presenting complaints, duration of illness, finding on clinical examination, and information from the haematological, biochemical and radiological investigations were recorded. Abdominal ultrasonography was carried out. All patients were kept nil per os before laparoscopy. After written consent, intravenous line was maintained and third generation cephalosporin was given before the procedure. After positioning, cleaning and draping, injection 2% Xylocaine was instilled as local anaesthetic agent in the periumbilical area. Pulse oximetry, blood pressure and oxygen saturation were monitored prior and duration the procedure.

Closed technique was employed for establishing pneumo-peritoneum with the help of Versus needle which was inserted at right angle to the abdominal wall, followed by insufflation of air. After removal of Versus needle trocar was inserted carefully into the abdominal wall. Laparoscopy was

performed using Olympus A5211 Laparoscope. Camera port was made at the anterior axillary line on left side of abdomen. Ascitic fluid aspiration was carried out. Laparoscopic peritoneoscopy was performed in systematic manner. Any abnormality was recorded according to the nature, size, colour and anatomic details of the lesion. Multiple biopsies were obtained after making a third port according to the feasibility and anatomic site of the lesion. Before withholding the biopsy sites were reevaluated, sites of insertion were stitched and aseptic dressings were carried out. In the post procedure blood pressure, pulse, respiratory rate, and temperature monitoring along with abdominal examination was done. Intravenous Pethedine was used as analgesic while a second shot of third generation cephalosporin was given 8 hours post procedure. Patients with uneventful recovery were discharged within 24 hours after the procedure.

Mean ages of the patients were 48.38 ± 16.7 years and 15 patients were male. Mean duration of presenting complaints were 3.31 ± 1.9 months.

Twenty four patients presented with fever, 22 had abdominal distension, 6 had abdominal pain, 12 patients had history of weight loss and 5 had generalized weakness. Co-morbid conditions present were cirrhosis of liver, 4 patients, Diabetes mellitus 2, hypertension 4 and 2 patients had chronic renal failure. Physical examination revealed pallor in 22 cases, jaundice in 3, and lymphadenopathy in 3 patients. Ascites was appreciable in 25 patients, hepatomegaly in 8 and splenomegaly in 3 patients while abdominal examination was normal in 8 patients. Laboratory data is shown in Table 1.

Abdominal ultrasonography revealed mild ascites in 12 patients, moderate ascites in 17 and severe ascites in 3

Table 1. Demographic data, clinical features and laboratory data, histopathological findings and complications of patients in whom laparoscopy was performed.

Demographic data		Clinical Features	
No of patients (n)	33	Nausea	8
Mean age	48.38 ± 16.7 years	Shoulder pain	5
Male/ female	15/17	Urinary Retention	2
Laboratory data		Abdominal pain	32
Hemoglobin	$12.4 + 1.3g/dl$	Abdominal Tenderness	10
ESR (mm 1st hr)	$65.72+26.13$	Abdominal distention	14
Serum Albumin G/dL	$3.86 + 0.42$	Serious complications	none
SAAG	$0.73 + 0.22$	Complications	
Serum Creatinine mg/dL	$1.19 + 0.57$	Abdominal pain	32
Histopathological findings		Nausea	8
Granulomatous		Shoulder pain	5
Inflammation	20		
Malignant lesion	7		
Cirrhosis of liver	4		
Budd-Chiari syndrome	1		

Table 2. Laparoscopic findings of patients in T.B. peritonitis, Carcinomatous peritonitis, Cirrhosis of liver, and Budd Chiari Syndrome.

	T.B peritonitis	Carcinomatous peritonitis	Cirrhosis of liver	Budd Chiari Syndrome
Ascitic Fluid Appearance				
Yellowish	19	4	4	1
Soapy	02	2	-	-
Reddish	-	1	-	-
Liver surface				
Abnormal	08	-	4	-
Normal	21	-	-	-
Lesions				
Nodules	19	5	-	-
Adhesions	7	-	-	-
Bands	2	-	-	-
Coagulations	1	2	-	-

patients. Laparoscopic findings revealed multiple discrete nodules on parietal and visceral peritoneum in 24 patients, coagulum in 3 patients, fibrosis in 3 patients and adhesions in 7 patients. Ascites was straw colored in 28 patients, reddish colour was noted in one patient and it was soapy in appearance in 4 patients. (Table 2).

Liver surface was found to be normal in 21 patients and there were yellowish white plaques on the liver seen in 12 patients. Intestines were inflamed in 2 patients. The histopathology findings of the biopsy specimens is given in Table 1.

Conclusion

Laparoscopy is a safe and cost effective diagnostic modality in expert hands and provides definitive diagnosis in majority of patients, when almost all non-invasive investigations remain inconclusive.

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