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The role of laparoscopy in the diagnosis of ascites of unknown etiology

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ABSTRACT

Introduction: Ascites is a pathological accumulation of detectable fluid in the peritoneal cavity. The standard procedure for diagnosis includes laboratory examinations and imaging methods. Diagnostic laparoscopy is a method that has been used for many years in patients whose etiology cannot be determined. The aim of this study was to define the value of diagnostic laparoscopy and histology in revealing the etiology of ascites of unknown origin.

Materials and Methods: This retrospective study was completed at İnönü University Turgut Özal Medical Center General Surgery Department between June 2010 and July 2020. The study was approved by the ethics committee. Patients were diagnosed with ascites by gastroenterology and hepatology. All patients with open heart surgery, kidney or advanced liver disease, and patients younger than 18 years of age were excluded.

Results: Six of the 23 patients in our study were male. The final diagnosis after laparoscopy was made by biopsy and laparoscopic fluid cytology. The pathology of specimens indicated 11 had tuberculosis, three had malignancy, four had mesothelioma, one had a malignant epithelial tumor, one had a gastrointestinal stromal tumor, and one had lymphoma. The etiology was unknown in two patients. Preoperative imaging and laparoscopic exploration were not possible in three patients. In this study, the accuracy of laparoscopy in the diagnosis of ascites of unknown origin was 91%.

Conclusion: Laparoscopy has had an important role in the diagnosis, staging, and treatment of peritoneal and other abdominal diseases in recent years. The cause of ascites of unknown etiology varies according to the location of the study. Although different results have been reported in the literature, diagnostic laparoscopy is a successful diagnostic method in cases that cannot be diagnosed with preoperative imaging and laboratory methods. According to these data, diagnostic laparoscopy is a fast and reliable method for ascites cases of unknown etiology.

Keywords: Ascites; abdominal tuberculosis; diagnostic laproscopy.

Introduction

Ascites is a pathological accumulation of detectable fluid in the peritoneal cavity.[1] Many diseases can cause this. It includes laboratory tests (cell count in ascitic fluid, albumin level, total protein level, Gram stain, culture and cytology) and imaging methods (ultrasonography (USG)

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and computed tomography (CT) scan). Most patients can be diagnosed with these methods. Ascites of unknown etiology poses a great diagnostic challenge for clinicians. The etiology is usually tuberculosis and peritoneal carcinomatosis.[2] As a minimally invasive technique, laparoscopy has been used for a long time in the evaluation of ascites whose cause cannot be determined clinically. Examination of the peritoneal cavity with a laparoscopic procedure was first tried in 1901 by George Kelling and was called celioscopy.[3] Although the usefulness of diagnostic laparoscopy has been questioned recently due to the emergence of various non-invasive screening techniques, it is a reliable technique for investigating patients presenting with ascites of unknown etiology. The aim of this study was to define the value of diagnostic laparoscopy and histology in revealing the etiology of ascites of unknown origin.

Materials and Methods

This retrospective study was completed at İnönü University Turgut Özal Medical Center General Surgery Department between June 2010 and July 2020. Approved by the ethics committee. A written consent form was signed by each patient to participate in this study. The main complaints of our patients were abdominal pain, bloating, fever, vomiting, weight loss or changes in bowel habits.

The patients included in our study were diagnosed with ascites by gastroenterology and hepatology. In addition to systemic and abdominal examination, all available laboratory tests including blood and ascites protein level, albumin level, serum acid albumin gradient were performed. Gram staining, culture and cytology examinations were performed from the ascites. As imaging methods, chest radiography, abdominal USG and abdominal CT were performed. Then, diagnostic laparoscopy was performed on these patients after appropriate preoperative evaluation. In this study, all patients with open heart surgery, kidney or advanced liver disease, and patients younger than 18 years were excluded.

Operative Technique

All surgeries were performed under general anesthesia using the three trocar technique. All patients were given pre-operative prophylactic antibiotherapy. Pneumoperitoneum was performed in all cases and the first port was entered through the umbilicus. The other two trocars were entered from the right and left sides of the umbilicus according to the appropriate working position of the surgeon. Ascites aspiration was routinely performed and sent for analysis. In addition, multiple biopsies were taken from all suspicious lesions. In order to prevent postoperative leakage of ascites, the abdominal wall and skin in the area where the trocar was entered were closed.

Results

The total number of patients in this study was 23 and there were six (26%) male. Our patients were from different age groups as summarized in Figure 1. The main admission symptoms were weight loss, abdominal pain, fever, vomiting, abdominal distension and changes in bowel habits. The duration of his complaints ranged from one month to six months. No patient had signs of peritonitis before surgery. Ascites was grade I in 34% of patients [mild (<1.5 l) and detected only on abdominal US or CT], in 66% of cases grade II (diagnosed by the floating dullness test) and grade III (visible and established with an exciting test). Abdominal CT was performed on all patients; both CT and USG were performed in 14 patients. Cytology and culture tests were performed on the ascites material taken before the operation in all patients. At the time of diagnosis, Ca 125 value was high in 19 patients, and it was within normal limits in two patients. In laparoscopic exploration of the abdominal cavity, only fluid in six of our patients, the appearance of peritonitis carcinomatosis in 11 patients, pseudomembranes in two patients, peritoneal thickening in three patients, and multiple lymphadenopathies were observed in one patient. Serum acid albumin gradient was high (>1.1 g/dl) in ten (45%) patients and low (<1.1 g/

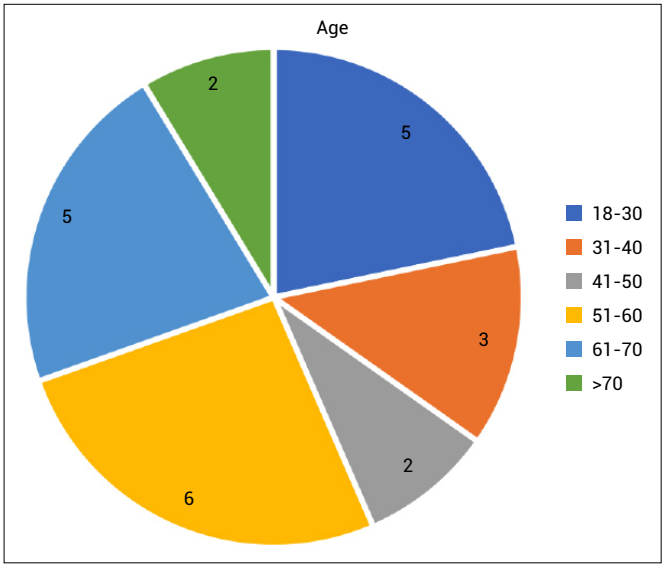

Figure 1. Distribution of patients by age groups.

dl) in 13 (55%) patients. After laparoscopy, the final diagnosis was made by biopsy and laparoscopic fluid cytology. Pathology of specimens; 11 (48%) tuberculosis, three malignancy (13%), four mesothelioma (17%), one malignant epithelial tumor (4%), one gastrointestinal stromal tumor (4%), one of them resulted in lymphoma (4%). The etiology was not known in two patients (Fig. 2).

Antibody tests were negative in 9 of 11 patients diagnosed with tuberculosis peritonitis before diagnostic laparoscopy. The examination of ascitic fluid of all patients was not sufficient to confirm the diagnosis of tuberculosis. In the tests performed after tuberculous peritonitis, pulmonary tuberculosis was also detected in three patients. During the follow-up, 1 patient was out of follow-up and the remaining 10 patients were started on anti-tuberculosis treatment. At the end of the first year, eight patients were controlled by USG and two patients by magnetic resonance imaging. Radiological response to treatment was obtained in all patients.

Preoperative imaging and laparoscopic exploration were incompatible in our three patients (Table 1). The average length of hospital stay of our patients was 4 (1-33) days. While no mortality due to surgery developed in any of our patients, one patient died on the 33rd postoperative day due to pulmonary complications. Two patients had trocar site hernia detected five months after laparoscopy. In this study, the accuracy of laparoscopy in the diagnosis of ascites of unknown origin was 91% (21 of 23 patients).

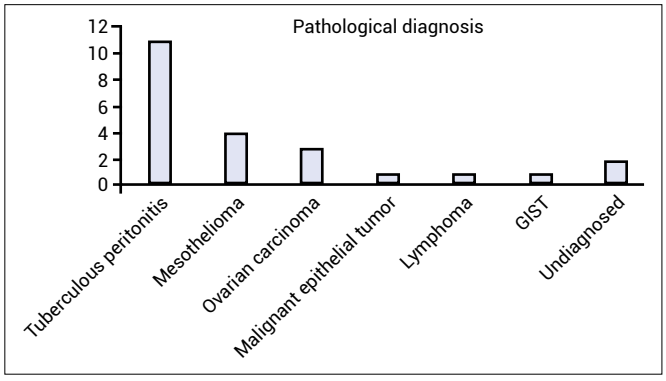

Figure 2. Postoperative pathology results.

Discussion

Ascites is the accumulation of fluid in the abdominal cavity, not a disease; is the result. Ascites etiology can be a local peritoneal or systemic disease. Identification of the fluid in the abdomen (by clinical, laboratory or radiological means) can guide us in the diagnosis of the unknown disease.[4] Clinical details are very important for acid diagnosis. In addition to a detailed medical history, common causes of ascites such as local abdominal and systemic examination, liver, kidney, cardiac and nutritional causes should be considered. In certain geographical regions where certain diseases such as viral hepatitis and tuberculosis are endemic, it is important to exclude these diseases in the diagnostic process. The gradual painless accumulation of ascitic fluid is indicative of a chronic benign condition; however, rapid accumulation of ascites and weight loss in a short time may indicate a malignant condition.[5] Routine laboratory tests and biochemical examination of ascitic fluid help reveal the etiology of ascites in most cases. Radiological examinations are the latest non-invasive tools that can assist us in diagnosing the cause of ascites; however, it has limitations in some cases. When all these diagnostic methods fail to reach the true cause of ascites, it is mandatory in the diagnosis of ascites of unknown origin by directly observing the peritoneal cavity with diagnostic laparoscopy and taking samples from the fluid, peritoneum and/or omentum.[6]

Diagnosis of peritoneal diseases by laparoscopy is well documented in many types of research. Laparoscopy has played an important role in the diagnosis, staging and treatment of peritoneal and other abdominal diseases in recent years.[7] The cause of ascites of unknown etiology varies according to the geography of the study. For exam-

Table 1. Cases in which preoperative imaging is incompatible with exploration

	Imaging	Laparoscopic exploration findings	Pathology result	Others
Patient 1	Ascites	Peritoneal carcinomatosis and a mass in the left ovary	Ovarian carcinoma	1 cm mass in the ovary
Patient 2	Ascites and omental thickening	Abdominal fluid	Benign	Omentum normal
Patient 3	Ascites and omental thickening	Peritoneal carcinomatosis and a mass in the right ovary	Ovarian carcinoma	2 cm mass in the ovary

ple, a study in Africa stated that tuberculous peritonitis was the cause in, 37 of 92 cases of ascites of unknown cause.[6] In contrast, another study from the USA showed that 30 of 51 cases were due to intra-abdominal malignancy and chronic liver disease.[1] Tarcoveanu et al.[8] stated that diagnostic laparoscopy can be very important and supportive in the management strategy of undiagnosed ascites.

Worldwide, the prevalence of extrapulmonary tuberculosis is increasing, especially in developing countries, in parallel with the rise of acquired immunodeficiency syndrome. Among the extrapulmonary tuberculosis cases, abdominal involvement is substantially 12%.[9] The incidence of ascites secondary to abdominal tuberculosis in our article, Chetan et al.[10] it is parallel to the results of the study conducted by. However, we had a higher incidence according to the results of Luck et al.[11]

In our study, the rate of surgical complications associated with diagnostic laparoscopy was very low. Trocar site hernia developed in two patients in the 5th postoperative month. Bacterial peritonitis did not develop in any of our patients after diagnostic laparoscopy. Chetan et al.[10] recommended antibiotherapy prophylaxis in order to prevent bacterial peritonitis. Surgical antibiotic prophylaxis was given as a single intravenous dose as soon as the patient was stabilised under anaesthetic, prior to skin incision in our study.

Conclusion

Diagnostic laparoscopy is useful for faster diagnosis of ascites cases of unknown etiology. With its high success rate, it prevents loss of time for treatment by distinguishing between malignant and benign. It also minimizes hospital stay and can be safely applied with good pre-operative preparation.

Disclosures

Ethichs Committee Approval: Inonu University Scientific Research and Publication Ethics Committee, dated 27/10/2020, decision number 2020/12 was approved.

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Conflict of Interest: None declared.

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