

# The Role of Laparoscopy in Diagnosis of Ascites of Obscure Etiology

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**Abstract:** *Background:* The role of diagnostic laparoscopy was markedly decreased with the advent of major developments in noninvasive imaging modalities such as ultrasonography, computed tomography, and magnetic resonance imaging. However, many reports suggest that imaging has a limited role in the diagnosis of exudative ascites. The aim of the present study was to answer the question if there still a place of laparoscopy in the diagnosis of ascites of obscure etiology?. *Methods:* We prospectively evaluated patients with undiagnosed exudative ascites seen in the internal medicine and general surgery departments in Sohag university hospital, Sohag, Egypt in the period from September 2014 till November 2016. *Results:* 32 patients were included in our study; 30 females(93.75%) and 2 males (6.25%) with a mean age of (range from 16 to 68 years). All patients were referred to surgery department due to ascites of obscure origin. No mortality was registered in this study; all patients were discharged from hospital the 2<sup>nd</sup> day after laparoscopy and returned to their home activity. The final pathological diagnosis after examination of ascetic fluid and biopsies that were taken by laparoscopy were carcinomatosis peritonei in 24 (75%), tuberculous peritonitis in 6 (18.75%) and liver cirrhosis in 2 cases (6.25%). *Conclusion:* Despite great advances in noninvasive diagnostic imaging techniques; diagnostic laparoscopy is still a valuable option for diagnosis of ascites of obscure etiology.

**Keywords:** Ascites, Laparoscopy, Carcinomatosis Peritonei, Tuberculous Peritonitis, Liver Cirrhosis

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## 1. Introduction

The value of laparoscopy in the diagnosis of ascites of obscure causes was approved by many studies [1]. In contrast with other diagnostic modality laparoscopy had many advantages along with visualization of the abdomen and pelvis with optimal magnification biopsies also can be taken under direct vision [2]. The use of diagnostic laparoscopy appear to have markedly decreased with the appearance of major developments in noninvasive imaging modalities such as ultrasonography, computed tomography, and magnetic resonance imaging, however, many reports suggest imaging, such as computed topography, ultrasound has a limited role in the diagnosis of exudative ascites [3]. The aim of this study was to assess the diagnostic accuracy of laparoscopy in patients with ascites of obscure origin.

## 2. Patients and Methods

We prospectively evaluated patients seen in the Gastroenterology unit and General surgery Department of Sohag University, sohag Faculty of Medicine between September 2014 till November 2016. The study was approved by the Ethic Committee board in Sohag University Hospitals. All patients had informed written consent prior to surgery.

All patients had a complete clinical examination, laboratory investigation (complete blood picture, liver function tests, tumor marker, endoscopic examination (upper and lower gastrointestinal endoscopy) and radiological evaluation including abdominal, pelvic ultrasound and CT chest, abdomen and pelvis. Also, aspiration of the ascetic fluid and analysis of the ascetic fluid was done. When all

these investigations were negative the patient assigned for laparoscopic evaluation.

### 3. Operative Technique

All operations were done under general anesthesia using three trocar techniques. The first port was fixed at the umbilicus in all cases. And the position of the other two tracers was variable according to the case. Pneumopreitoneum was done in all cases and aspiration of the ascetic fluid was done and was routinely sent for analysis. Also, multiple biopsies of the entire suspected lesion were taken. Careful in-layer closure of all abdominal layers to prevent post-operative leakage of the ascetic fluid was done.



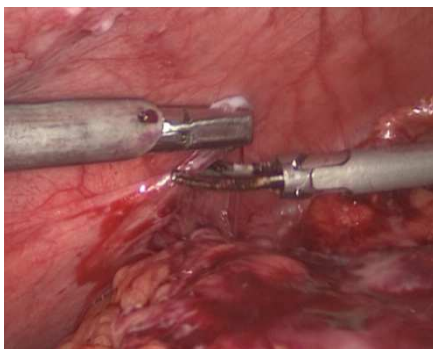
*Figure 1. Ascitic Fluid and peritoneal nodule.*



*Figure 2. Omental mass and peritoneal nodule.*



*Figure 3. Biopsy from omental mass.*



*Figure 4. Biopsy from peritoneal nodule.*

### 4. Results

Between September 2014 till November 2016, a total of 32 patients were included in our study. Thirty of them (93.75%) were females and two (6.25%) were males. Patient age ranged between 16 years and 68 years. All the patient was referred to the surgery department due to ascites of unknown cause. Two patients had weight loss as a presenting symptom. No mortality or morbidity was registered in our study. The entire patients were discharged from in the hospital after 24 hours after they completely recovered from anesthesia and returned to their home activity. The final histopathological diagnosis after analysis of ascetic fluid and biopsies that were obtained by diagnostic laparoscopy was: (1) carcinomatosis peritonei in 24 (75%) cases (2) tuberculous peritonitis in 6 (18.75%) cases (3) cirrhosis in 2 (6.25%) cases.

### 5. Discussion

Many studies approved the feasibility of laparoscopy in the exploration of the ascites of unknown origin as well as its high sensitivity and specificity [4]. The etiological diagnosis is difficult due to the lack of specific clinical, radiological, or biological signs and the fact that none of the proposed complementary tests have sufficient positive predictive value for accurate diagnosis. Consequently, a histological sample from a peritoneal or liver biopsy, that obtained by laparoscopically, is mandatory to detect the final etiologic diagnosis [5].

Among the total of 32 patients included in our study, thirty of them (93.75%) were females and two only (6.25%) were males. In literature, females were the most frequently encountered gender (66% to 100% of the cases) [6].

In our study carcinomatosis peritonei was diagnosed in 24 (75%) cases. In the peritoneal carcinomatosis, the size of peritoneal nodules up to 1 with irregular distribution on the peritoneum, abdominal, pelvic viscera and diaphragm, multiple biopsies from the primary tumor if it was identified in addition laparoscopy can predict the tumor operability in cases of cancer and thus avoiding unnecessary surgery [7].

Peritoneal tuberculosis has significant diagnostic difficulties due to the poor sensitivity and specificity of complementary tests and the low rate of positive bacteriological test and the delay of the culture results for about more than two months [8]. Histopathology is the accurate method for the diagnosis of peritoneal tuberculosis and can differentiate it from other pathology such as peritoneal carcinomatosis.

Exploratory Laparotomy was the only method for accurate diagnosis of peritoneal tuberculosis nowadays laparoscopy is the most accurate tool in suspected cases of peritoneal tuberculosis. Indeed, it allows a rapid diagnosis and can detect specific lesions (peritoneal granulations, adhesion, and inflammatory aspect of the peritoneum) and allows peritoneal biopsies. Laparoscopy allows the diagnosis of peritoneal tuberculosis in 72% - 97% of cases [7]. In comparisons with laparotomy laparoscopy had a

lesser complications and they are about of 3% according to the literature [8]. Example of these complications are hemorrhage and intestinal perforation (in our series, no cases of perforation Or hemorrhage were detected).

This difficult diagnostic situation increases the need for rapid etiologic diagnosis in patients with exudative ascites for adequate treatment for TB. The peritoneal biopsies, which obtained by laparoscopy, are the only way to achieve diagnosis by the better visualization and also by the quality of the biopsy material obtained with laparoscopy [9].

Tuberculous peritonitis was diagnosed in 6 (18.75%) cases in this study. Bedoui *et al.* In 2007 in their study that involving 90 patients, the accuracy of the laparoscopy in the detection of peritoneal tuberculosis were 85%. Peritoneal biopsies detect tuberculosis and peritoneal carcinomatosis in 98% and 100% of the cases respectively [1].

The evaluation and management of patients with liver cirrhosis is a critical issue. Liver biopsy and histopathology is the most accurate tool for diagnosis of cirrhosis however, it is an invasive technique and not free from complications and this lead to the preference of noninvasive tools such as imaging and biochemical test by the clinician. abdominal ultrasonography is the most commonly used imaging modality for diagnosis of liver cirrhosis. However, its accuracy is a matter of debate. Many studies detect its low sensitivity and specificity in diagnosis of early cirrhosis in comparison with histopathology report while other studies detect the accuracy of high resolution liver ultrasound in diagnosis of liver cirrhosis [10]. Macronodular cirrhosis can be falsely diagnosed as metastasis and can lead to inappropriate management [10]. Nowadays laparoscopy can be safely used in diagnosis of liver cirrhosis. In comparison to the ordinary biopsy technique such as blind biopsy technique and ultrasound guided biopsy laparoscopy allow direct visualization of both liver lobe in addition to high sensitivity and specificity can reach up to 100%. good and direct haemostasis can be also obtained by various energy tool during laparoscopy and this can minimize bleeding complication [11].

Thoreau and his college in 2002 reported the availability of diagnostic laparoscopy in detecting liver disease and metastasis that may not be detected by the conventional imaging techniques as CT, MRI, scintigraphy and hepatic angiography [12], In our study cirrhosis was detected in 2 cases (6.25%).

In our study, no mortality or morbidity was detected after diagnostic laparoscopy. So laparoscopy is an accurate tool with nearly zero mortality and very low morbidity, but nevertheless, it is a surgical operation with the real inherent risks of anesthesia and surgery [13].

The causes of ascites of unknown origin differ considerably by geographic area and ethnic origin. An African study reported that 40% of 92 cases with ascites of obscure origin had tuberculous peritonitis [14]. Another study from the United States revealed that about 60% of 51 cases with ascites of obscure origin proved to be intra-abdominal malignancy or chronic liver disease [15]. These results

suggest that laparoscopy is a reliable method for diagnosis ascites of obscure etiology than any other methods.

## 6. Conclusion

Despite great advance in noninvasive diagnostic mode. Diagnostic laparoscopy remains a valuable treatment option for diagnosis of ascites of obscure etiology.

## Conflict of Interest

The authors declare that they don't have any conflict of interest.

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