

ORIGINAL RESEARCH

Assessment of Enumeration of Various Causes of Ascites of Obscured Origin**Dr. Mohammad Hamza¹, Dr. Abhishek Kumar², Dr. Amit Prakash³, Dr. Mohammad Shahid Hasnain⁴**^{1,2,3,4}Senior Resident, Department of General Surgery, AIIMS, Patna, Bihar, India**Corresponding Author: Dr. Mohammad Shahid Hasnain**dr.mshahid2014@gmail.comReceived: 28th Jan, 2024Accepted: 19th Feb, 2024**Abstract:**

Background: Ascites, the pathological accumulation of fluid in the peritoneal cavity, presents a diagnostic challenge when its etiology is obscure. Differentiating between causes like tuberculosis, malignant ascites, and others remains critical for appropriate management. The utility of Diagnostic Laparoscopy (DL) in revealing the underlying causes has been emphasized, given its ability to provide visual inspection and obtain targeted biopsies under direct vision.

Materials and Methods: This longitudinal observational study enrolled 20 patients with ascites of obscured origin at the All India Institute of Medical Sciences, Patna, from June 2019 to March 2021. Inclusion criteria focused on patients over 15 and under 80 years of age, suitable for general anesthesia, and with inconclusive results from conventional diagnostic methods. The study excluded patients with coagulopathy, generalized peritonitis, hemodynamic instability, recent laparotomy, and other specific conditions. Diagnostic Laparoscopy was performed following comprehensive clinical, laboratory, and imaging evaluations, including Ultrasound and Contrast-Enhanced Computed Tomography.

Results: The study identified tuberculosis (50%), peritoneal carcinomatosis (30%), liver cirrhosis (10%), and undiagnosed causes (10%) as the primary etiologies of ascites. Notably, the malignant ascites subgroup revealed primary malignancies predominantly originating from the gastrointestinal tract (50%), gall bladder (33.33%), and ovaries (16.66%). The diagnostic yield of laparoscopy was further enhanced by ascitic fluid analysis and targeted biopsies, facilitating accurate etiological classification.

Conclusion: Diagnostic Laparoscopy stands as a pivotal diagnostic tool in the assessment of ascites of obscured origin, offering a high diagnostic yield that aids in distinguishing between tuberculosis, peritoneal carcinomatosis, and other causes. Its ability to enable direct visualization and targeted biopsies underpins its value in the diagnostic algorithm, leading to timely and appropriate management strategies for affected patients.

Keywords: Ascites, Diagnostic Laparoscopy, Tuberculosis, Peritoneal Carcinomatosis, Liver Cirrhosis, Obscured Origin.

Introduction:

Ascites represents a common clinical dilemma, characterized by the pathological accumulation of fluid within the peritoneal cavity. Its etiology is diverse, ranging from liver cirrhosis, malignancies, to infectious causes like tuberculosis (1). The diagnosis of ascites, particularly when its origin remains obscure, poses significant challenges to clinicians, necessitating a thorough and multidisciplinary approach to elucidate the underlying cause.

The classification of ascites into high and low Serum-Ascites Albumin Gradient (SAAG) ascites has facilitated the diagnostic process, enabling a more systematic approach towards identifying its etiology (2). High SAAG ascites are often related to portal hypertension, commonly due to liver cirrhosis, whereas low SAAG ascites are associated with conditions like tuberculosis, peritoneal carcinomatosis, and pancreatitis (3). Despite advancements in diagnostic modalities, including imaging techniques and laboratory evaluations, a considerable number of cases remain undiagnosed, termed as Ascites of Unknown Etiology (AUE) (4).

Diagnostic Laparoscopy (DL) has emerged as a crucial diagnostic tool in cases where traditional diagnostic approaches fail to reveal the cause of ascites. It offers the advantage of direct visualization of the peritoneal cavity and the ability to obtain targeted biopsies, thus enhancing diagnostic accuracy (5). DL's role in distinguishing between tuberculous ascites and peritoneal carcinomatosis has been particularly highlighted, given the overlapping clinical and radiological features of these conditions (6).

The significance of DL in the evaluation of ascites of obscured origin underpins its value in the early diagnosis and management of this condition, ultimately contributing to improved patient outcomes. This study aims to assess the enumeration of various causes of ascites of obscured origin, emphasizing the diagnostic accuracy and utility of DL in uncovering the underlying etiologies.

Materials and Methods:

Study Design and Setting: This study was a longitudinal observational study conducted at the Department of General Surgery, All India Institute of Medical Sciences, Patna, from June 2019 to March 2021. The research aimed to assess the diagnostic accuracy of Diagnostic Laparoscopy (DL) in patients presenting with ascites of obscured origin.

Study Population: Patients referred to the Department of General Surgery with ascites, where the etiology remained obscure after initial clinical, laboratory, and radiological evaluations, were considered for inclusion. The inclusion criteria were: age >15 and <80 years, fitness for general anesthesia and ascites of unknown etiology after comprehensive evaluation. Exclusion criteria included inability to tolerate pneumoperitoneum or general anesthesia, uncorrected coagulopathy, generalized peritonitis, hemodynamic instability, mechanical or paralytic ileus, acute pain abdomen, bowel perforation, acute intestinal obstruction, a tense or distended abdomen, recent laparotomy, pregnancy, cardiopulmonary compromise, and morbid obesity.

Sampling Technique: A convenient sampling method was employed to select patients fulfilling the inclusion and exclusion criteria during the study period.

Diagnostic Procedure: All patients underwent a comprehensive evaluation that included history taking, physical examination, laboratory tests (including liver function tests, kidney function tests, and complete blood count), imaging studies (Ultrasound and Contrast-

Enhanced Computed Tomography), and ascitic fluid analysis. Diagnostic Laparoscopy was performed under general anesthesia, following a standard protocol. The procedure involved creating pneumoperitoneum using carbon dioxide, insertion of 2 to 3 ports, and thorough inspection of the peritoneal cavity. Ascitic fluid samples were collected, and targeted biopsies were taken from suspicious areas under direct vision.

Ascitic Fluid Analysis: Ascitic fluid obtained through ultrasound-guided paracentesis was analyzed for biochemical parameters, cell count, microbiology (including Gram stain and culture for AFB), and cytology.

Statistical Analysis: Data were analyzed using IBM SPSS Software version 20. Categorical variables were expressed as frequencies and percentages, while continuous variables were presented as means with standard deviation. The diagnostic accuracy of DL, including sensitivity and specificity, was calculated against the gold standard of histopathological findings.

Results

The study evaluated the etiology of ascites of obscured origin in 20 patients through diagnostic laparoscopy, complemented by ascitic fluid analysis and targeted biopsies. The demographic analysis revealed a diverse age distribution, with a slightly higher prevalence in the age group of 21-40 years (35%). Gender distribution across the final diagnosis groups showed a balanced representation, with females accounting for 55% of the total cases.

Etiology of Ascites: The primary causes of ascites identified were tuberculosis (50%), peritoneal carcinomatosis (30%), liver cirrhosis (10%), and undiagnosed cases (10%). Among the peritoneal carcinomatosis cases, the origins of the primary malignancy were predominantly gastrointestinal tract (50%), gall bladder (33.33%), and ovaries (16.66%).

Severity of Ascites: The severity of ascites varied among the patients, with 40% presenting with severe ascites, followed by moderate (30%), mild (20%), and minimal (10%) cases. This distribution underscores the significant clinical burden and variability in the presentation of ascites of obscured origin.

Omental and Peritoneal Findings: Omental thickening and nodular patterns were more prevalent in malignant ascites, indicating the aggressive nature and extensive spread of malignancies within the peritoneal cavity. Tuberculous ascites, on the other hand, frequently exhibited micronodular patterns on the parietal peritoneum, reflecting the disseminated nature of tuberculosis infection within the peritoneal space.

Diagnostic Laparoscopy Findings: Diagnostic Laparoscopy played a crucial role in identifying the underlying causes of ascites, with specific findings correlating well with histopathological results. The procedure not only facilitated direct visualization of peritoneal abnormalities but also allowed for precise targeting during biopsies, enhancing diagnostic accuracy.

Summary of Observations and Results:

Parameter	Tuberculosis (%)	Peritoneal Carcinomatosis (%)	Liver Cirrhosis (%)	Undiagnosed (%)	Total (%)
Age Group	<20 (25.0), 21-40 (35.0), 41-60 (30.0), >60 (10.0)	-	-	-	100
Gender	Male (45.0), Female (55.0)	-	-	-	100
Severity of Ascites	Minimal (10), Mild (20), Moderate (30), Severe (40)	-	-	-	100
Omental Pattern	Thickening (30), Nodular (25), Adhesion (20)	-	-	-	75
Primary Site of Malignancy (PC cases)	-	GI tract (50), Gall Bladder (33.33), Ovaries (16.66)	-	-	100

The study underscores the diverse etiology of ascites of obscured origin, with tuberculosis and peritoneal carcinomatosis being the most common causes. Diagnostic Laparoscopy, complemented by ascitic fluid analysis and targeted biopsies, proved to be an invaluable tool in delineating the underlying causes, thereby guiding appropriate management strategies for affected patients.

The findings from our study highlight the critical role of diagnostic laparoscopy in elucidating the causes of ascites when its origin remains obscured after conventional diagnostic approaches. Consistent with prior research, tuberculosis and peritoneal carcinomatosis emerged as the predominant causes of ascites of obscured origin in our cohort, accounting for 50% and 30% of cases, respectively (1,2). This distribution underscores the epidemiological variability of ascites etiology, which can be significantly influenced by geographical and demographic factors (3).

The high prevalence of tuberculosis in our study aligns with reports from regions with a high burden of the disease, emphasizing the need for heightened clinical suspicion in endemic areas (4). The diagnostic challenge posed by tuberculous peritonitis, owing to its non-specific presentation and often inconclusive conventional diagnostic tests, is well-documented (5). Our findings reiterate the utility of diagnostic laparoscopy in such scenarios, providing a direct visual assessment and enabling targeted biopsies, thereby facilitating a definitive diagnosis.

Peritoneal carcinomatosis, primarily originating from the gastrointestinal tract, gall bladder, and ovaries in our study, reflects the aggressive nature and spread of certain malignancies within the peritoneal cavity. The ability of diagnostic laparoscopy to detect subtle peritoneal deposits and nodularity, often missed by imaging techniques, is crucial for early diagnosis and staging, which significantly impacts management strategies and prognosis (6,7).

The role of diagnostic laparoscopy extends beyond merely identifying the cause of ascites. It offers insights into the disease extent and morphology, such as omental thickening and nodularity, which are pertinent for tailoring therapeutic interventions. This capability is particularly beneficial in cases of peritoneal carcinomatosis, where the extent of peritoneal involvement influences the feasibility and approach of cytoreductive surgery and hyperthermic intraperitoneal chemotherapy (HIPEC) (8).

Our study, however, is not without limitations. The single-center design and the relatively small sample size may restrict the generalizability of the findings. Additionally, the exclusion criteria might have led to the omission of patients with acute presentations, potentially skewing the etiological spectrum. Future studies with larger, multicentric cohorts are warranted to validate our findings and explore the diagnostic yield of laparoscopy in a broader clinical context.

Conclusion

In conclusion, diagnostic laparoscopy stands out as an indispensable tool in the arsenal of diagnostics for ascites of obscured origin. Its ability to provide direct visualization, coupled with targeted biopsies, underscores its superiority over conventional diagnostics, especially in cases of tuberculosis and peritoneal carcinomatosis. The findings from our study advocate for the integration of diagnostic laparoscopy into the diagnostic pathway of ascites of unknown etiology, ensuring timely and accurate diagnosis, which is paramount for effective management and improved patient outcomes.

References

1. Bhargava DK, Shriniwas, Chopra P, Nijhawan S, Dasarathy S, Kushwaha AKS. Peritoneal tuberculosis: Laparoscopic patterns and its diagnostic accuracy. *Am J Gastroenterol.* 1992;87(1):109-12.
2. Runyon BA. Management of adult patients with ascites due to cirrhosis: An update. *Hepatology.* 2009;49(6):2087-107.
3. Moore KP, Wong F, Gines P, Bernardi M, Ochs A, Salerno F, et al. The management of ascites in cirrhosis: Report on the consensus conference of the International Ascites Club. *Hepatology.* 2003;38(1):258-66.
4. Akriviadis E, Runyon BA. Utility of an algorithm in differentiating spontaneous from secondary bacterial peritonitis. *Gastroenterology.* 1990;98(1):127-33.
5. Yuan S-M, Lin H. A retrospective study of tuberculous peritonitis in a regional hospital in Taiwan. *Trop Med Int Health.* 2005;10(8):743-50.
6. Kriplani AK, Kapur BM. The role of diagnostic laparoscopy in chronic abdominal conditions: An overview of 132 cases. *J Postgrad Med.* 1995;41(3):77-80.
7. Cuesta MA, Meijer S, Derksen WJ. Laparoscopic visualization of the peritoneal cavity in the diagnosis of abdominal malignancy. *SurgEndosc.* 1993;7(5):361-5.
8. Sugarbaker PH. Peritoneal carcinomatosis: Principles of management. *Cancer Treat Res.* 1996;82:359-74.