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CASE REPORT

Pigtail Catheter for Treatment of Massive Postpartum Ascites: A Rare Case Report in Somalia

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Introduction: Postpartum ascites is a rare but potentially serious complication characterized by the abnormal accumulation of fluid in the peritoneal cavity following childbirth. The condition may result from various etiologies, including infections, liver dysfunction, preeclampsia-related syndromes, and malignancies. In resource-limited settings, its diagnosis and management pose unique challenges. This case report aims to highlight the successful use of a pigtail catheter for continuous drainage in managing massive postpartum ascites of infectious origin in Somalia.

Case Presentation: A 35-year-old multiparous woman (G9P6) presented seven days postpartum with abdominal distension, fever, nausea, and vomiting. All symptoms began acutely on the second day after an uncomplicated full-term spontaneous vaginal delivery. Initial assessment revealed signs of systemic inflammation, leukocytosis, and hypoalbuminemia. Abdominal ultrasound and CT imaging confirmed massive ascites with thick septations, raising suspicion of abdominal tuberculosis or peritonitis. Despite initial empiric antibiotics and large-volume paracentesis, her condition worsened. A percutaneous pigtail catheter was placed under ultrasound guidance, allowing continuous controlled drainage (up to 2000 mL/day). The patient showed progressive clinical and laboratory improvement with antibiotic escalation and supportive care, including albumin infusion. Serial ultrasounds demonstrated gradual resolution of ascites, and the catheter was removed after six weeks with no recurrence.

Conclusion: This case underscores the importance of a systematic, multidisciplinary approach to postpartum ascites, particularly in settings with limited diagnostic resources. The use of a pigtail catheter provided an effective, minimally invasive method for managing refractory ascitic fluid, reducing the need for repeated paracentesis and its associated complications. This technique serves as a viable therapeutic strategy in resource-limited environments where conventional management may be constrained. Early intervention with imaging-guided drainage and targeted therapy can be life-saving. Further research is needed to guide standardized management protocols for postpartum ascites.

Keywords: postpartum ascites, pigtail catheter, postpartum complications, resource-limited setting, interventional radiology

Introduction

Ascites, the abnormal accumulation of fluid in the peritoneal cavity, is a relatively rare condition that can occur in the postpartum period. Usually, a small volume of fluid (25–50 mL) is present in the peritoneal cavity to facilitate bowel movements and maintain the hydration of serous surfaces.[1]

While ascites can arise from various causes, the physiological changes following childbirth present unique diagnostic challenges.[1] Postpartum ascites, although uncommon, may manifest due to several underlying conditions. It can be idiopathic or indicative of more serious disorders such as HELLP syndrome or eosinophilic gastrointestinal disease (EGID).[2] In Western countries, the leading cause of ascites is cirrhosis, accounting for approximately 75% of cases, followed by peritoneal malignancy (12%), heart failure (5%), and peritoneal tuberculosis (2%).[1] In women who are

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diagnosed to have ascites in the postpartum period, it is essential to rule out other possible causes of ascites through proper history and examination and necessary investigations.

The complications of ascites can be life-threatening and can lead to dehydration, SBP, respiratory failure, Heart failure, worsening of nutritional status, hyponatremia, or HRS and thromboembolism.[3,4]

The key to the successful management of patients with ascites is the stratification of the risk of an adverse outcome and personalized therapy.[5]

This case report describes the successful management of massive postpartum ascites, likely of infectious etiology, using a pigtail catheter for continuous drainage in a resource-limited setting in Somalia, and discusses its clinical implications for similar contexts.

Case Presentation

A 35-year-old woman who was 7 days postpartum, with a history of 9 previous pregnancies and 6 live births (G9P6) presented to the Emergency Department with multiple episodes of high-grade fever, generalized abdominal pain, abdominal distension, nausea, and vomiting for 7 days.

All symptoms began acutely after delivery. She was entirely asymptomatic during pregnancy. The abdominal pain, distension, fever, nausea, and vomiting started on the second day postpartum.

She had history a full-term, spontaneous vaginal delivery (SVD) without any recorded complications seven days prior. Initially, she was admitted to a local hospital at five days postpartum with abdominal distension and fever. An abdominal ultrasound revealed ascites with thick septations. She was started on empiric antibiotics (ceftriaxone and metronidazole) and analgesics but showed no improvement, leading to her referral to our tertiary hospital for further management on day seven postpartum.

The antenatal period was uncomplicated. There was no documented history of hypertension, proteinuria, or other signs of preeclampsia during pregnancy or at delivery.

Upon arrival, the patient was tachycardic (heart rate: 120 bpm), tachypneic (respiratory rate: 30 breaths/min), and febrile (temperature: 39°C/102.2°F), with a blood pressure of 108/64 mmHg and hypoglycemia (blood glucose: 68 mg/dL). Her Glasgow Coma Scale (GCS) score was 15/15. Physical examination revealed a soft but tender abdomen with suprapubic tenderness and mild guarding in all quadrants. There were no signs of peripheral edema, jaundice, or palmar erythema.

The initial laboratory investigation showed leukocytosis 19.13 x10^9/L (normal 4.00–10.00 x10^9/L), hemoglobin 8.2 g/dl (normal 12.0–16.0 g/dl), hematocrit 0.250 (normal 0.400–0.540), platelet 658x10^9/L (normal 100–300x10^9/L), C-reactive protein >300.00 mg/L (normal 2.5–10 mg/L), alkaline phosphatase 392.3 U/I (normal 40–306 U/I) albumin 1.9mg/dl (normal 3.5–5.3 mg/dl), other rest of investigation (Table 1). Abdominal U/s reported massive

Table 1 Result of the Laboratory Investigations

Tests	Reference Range	On Admission	On Ward	On Discharge
White cell count (WBC, *109 /L)	4.00–10.00	19	20	10
Hemoglobin (HB, g/dl)	12.0–16.0	8.2	10.2	11
Platelet (PLT, *109 /L)	100-300	658	400	340
Neutrophil %	0.500–0.700	0.866	0.666	0.550
Lymphocyte %	0.200–0.400	0.09	0.06	0.05
Eosinophil %	0.005–0.050	0.002	0.002	0.050
C-reactive protein (CRP, mg/L)	2.5-10	>300	250	20
Aspartate transaminase (AST-U/L)	6-38	32.2	29	22

(*Continued*)

Table 1 (Continued).

Tests	Reference Range	On Admission	On Ward	On Discharge
Alanine transaminase (ALT, U/L)	6-40	35	19.6	25.2
Creatinine (Creatinine, mg/dl)	0.4–1.4	0.5	0.7	1.2
Blood urea (Blood urea, mg/dl)	10-50	33.6	27.3	23.4
Sodium (Na+, mmol/l)	135.0–145.0	140.3	142.2	139.6
Potassium (K+, mmol/l)	3.5–5.5	4.3	3.6	3.9
Calcium (Ca+, mmol/l)	2.12–2.62	2.01	2.26	2.24
Serum Albumin	3.5–5.3	1.9	2.2	2.5
Total Bilirubin	0.3–1.35	3.31	2.5	1.6

Ascites (Figure 1). The patient was admitted with a diagnosis of postpartum ascites and suspected abdominal tuberculosis with peritonitis. Empiric treatment included intravenous ceftriaxone, metronidazole, and supportive care with dextrose infusion and ondansetron. On the first day post ward admission, Abdominal paracentesis was performed, draining 2000 mL of yellowish milky fluid, and albumin (20%) was administered before and after the procedure. Fluid analysis showed elevated white blood cells, CRP, and neutrophils, with low albumin levels. GeneXpert testing was negative, and Serum-ascites albumin gradient (SAAG) was normal (Table 2).

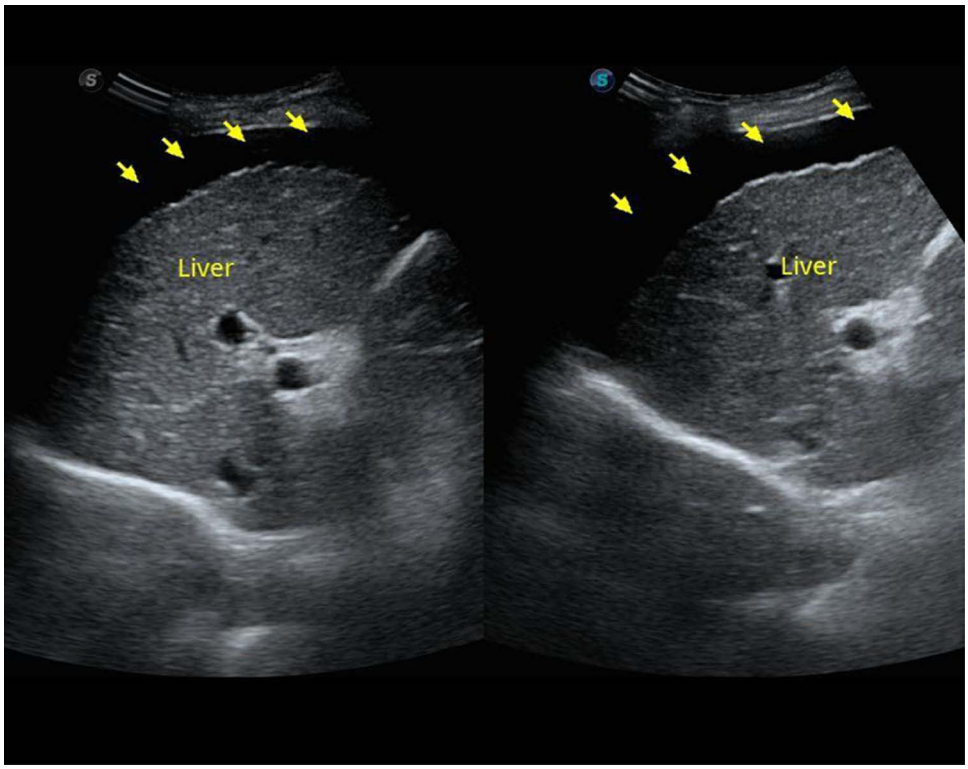

Figure 1 Abdominal Ultrasound showed massive Ascites, the yellow arrow indicates ascites.

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Table 2 Analysis and Fluid Culture

Result Name	Value	Reference Range
Total protein [mg/dl]	4.5	<4.0
Triglyceride [g/dl]	31	40 – 140
Albumin [g/dl]	1.5	3.5 –5.5
Glucose [mg/dl]	65.53	75 – 115
Amylase [u/l]	58	28 – 150
Gen-expert for TB	Negative	Positive/Negative
Cytology	Negative for malignant cell	Positive/Negative

On the second day post-admission, computed tomography (CT) of the abdomen and pelvis revealed massive ascites with thickened enhancing peritoneal walls, and there was no evidence of any other focus of infection within the peritoneal cavity (Figure 2). Laboratory results showed worsening leukocytosis (21 $x10^9$/L) and elevated CRP, while other investigations were normal (Table 1). The patient's clinical condition deteriorated with increasing abdominal distension. Antibiotics were escalated to piperacillin-tazobactam and metronidazole, alongside supportive measures, including albumin infusion. A pigtail catheter was inserted under ultrasound guidance by an interventional radiologist to provide continuous drainage of ascitic fluid (Figure 3). A maximum of 2000 mL/day was drained, and Therapeutic antibiotics were continued. As her clinical condition improved, she was taught how to care for the drain and document output, and she was discharged. The total drainage volume and duration were documented. The patient showed significant clinical and laboratory improvement (Table 1), with follow-up abdominal ultrasounds showing progressively decreasing fluid collection. Two weeks post-discharge, only mild residual ascites was detected (Figure 4), and after one month, the ultrasound confirmed significant resolution of the ascites (Figure 5). The patient was successfully managed and discharged in stable condition, with no recurrence of symptoms at subsequent follow-ups and drain was removed after 6 weeks.

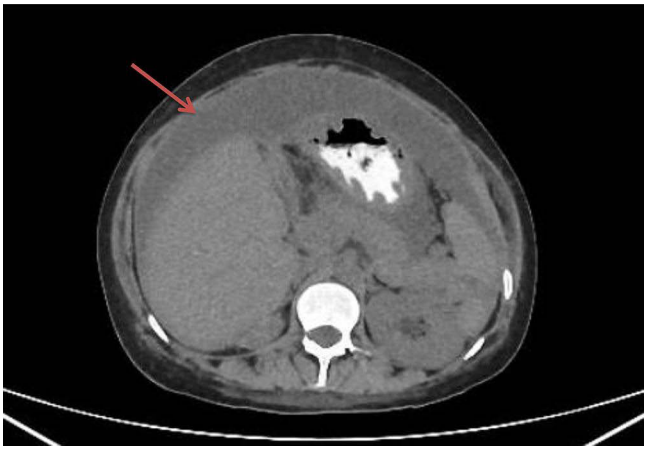

Figure 2 CT scan showed massive ascites with thick enhancing walls, the red arrow indicates ascites.

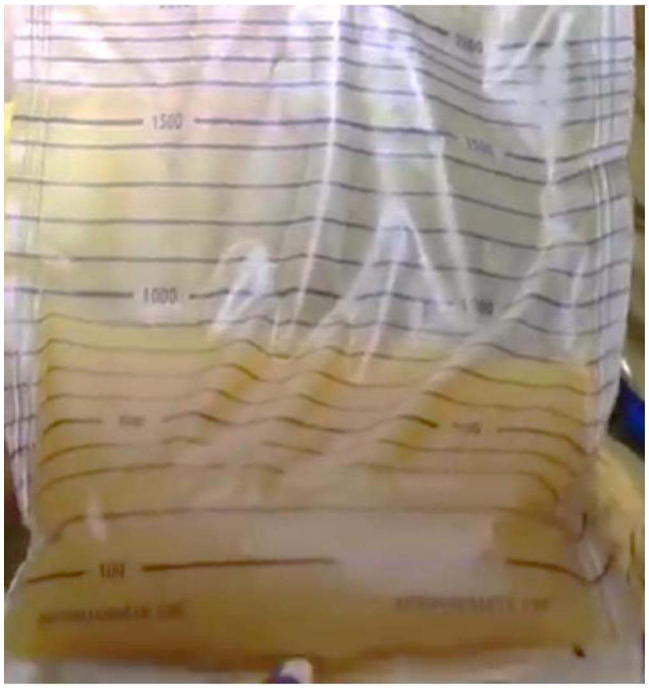

Figure 3 Pigtail Fluid Drainage Bag.

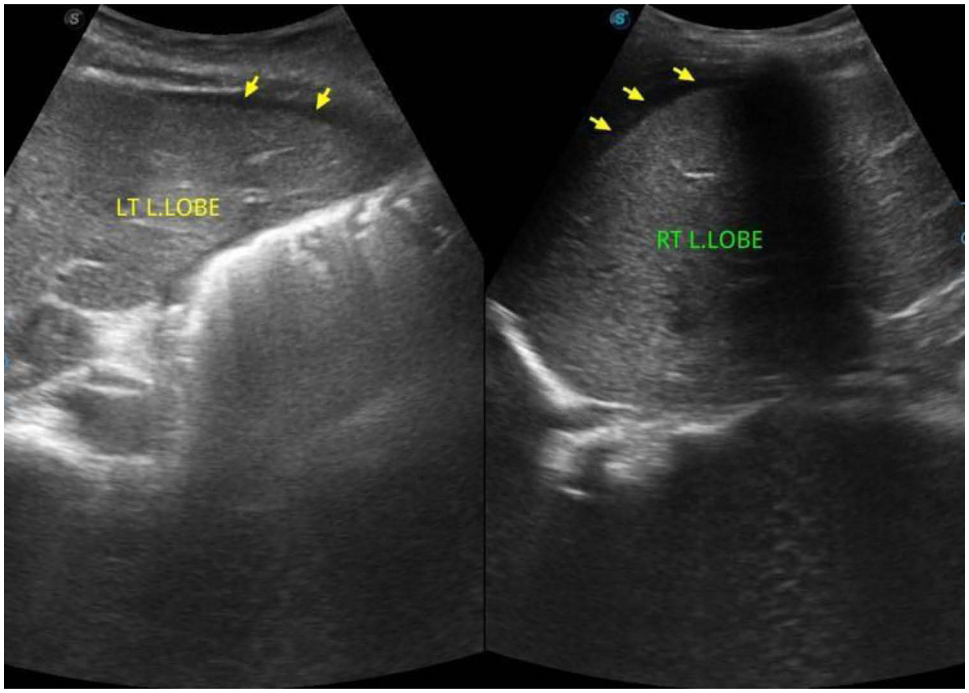

Figure 4 Follow-up ultrasound showed mild ascites, the yellow arrow indicates ascites.

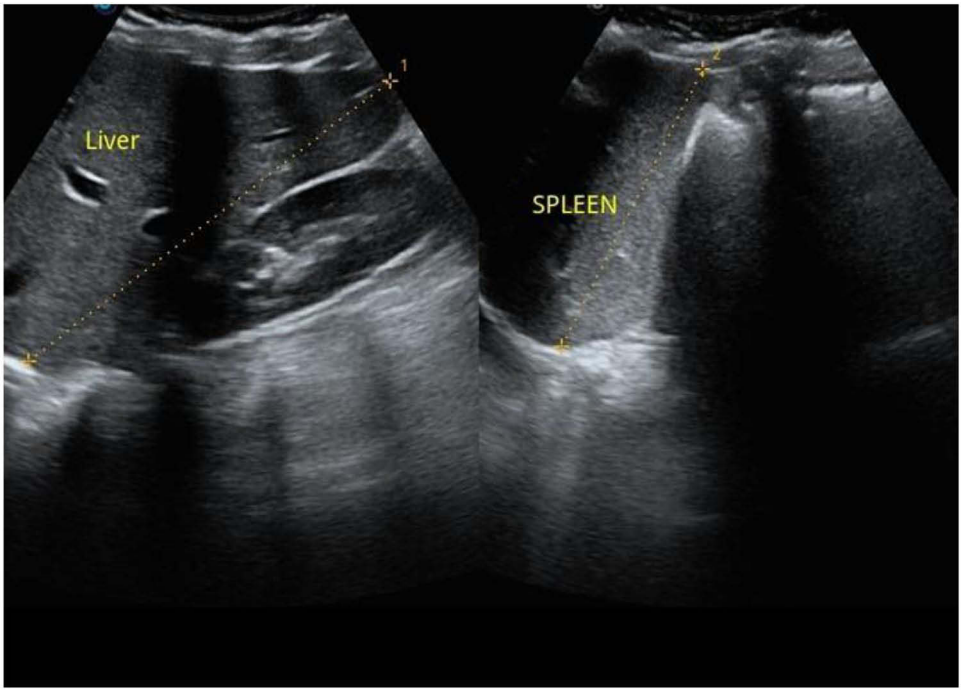

Figure 5 Follow-up normal abdominal ultrasound.

Discussion

This case highlights a rare and delayed presentation of postpartum ascites with suspected abdominal tuberculosis and peritonitis. The initial presentation and ultrasound findings of massive ascites with thick septations raised suspicion of abdominal tuberculosis, a common etiology of ascitic fluid in endemic regions. However, the subsequent negative GeneXpert test and a normal serum-ascites albumin gradient (SAAG) ruled out tuberculosis and indicated an alternative etiology. Postpartum ascites remains uncommon and is associated with multiple potential causes, including infections, preeclampsia, hepatic dysfunction, and malignancy.[6,7]

Postpartum ascites refers to the accumulation of fluid within the peritoneal cavity after delivery, and its pathophysiology is multifactorial. One of the key contributors is infectious causes. Postpartum infections, such as bacterial peritonitis, can occur due to ascending infections following prolonged labor, cesarean delivery, or intrauterine infections like chorioamnionitis. In these cases, pathogens may translocate into the peritoneal cavity, leading to peritoneal inflammation, neutrophilic exudation, and subsequent fluid accumulation. Tuberculosis, which constitutes 2% of infectious causes, induces granulomatous inflammation and increases vascular permeability, which results in proteinaceous ascitic fluid.[8,9]

Preeclampsia and HELLP syndrome also play significant roles in the pathophysiology of postpartum ascites. Preeclampsia is characterized by endothelial dysfunction, systemic vasoconstriction, and increased capillary permeability, all of which can cause extravasation of fluid into the peritoneal cavity. HELLP syndrome, a severe variant of preeclampsia, exacerbates hepatic microvascular injury. This can lead to subcapsular hematomas, hepatic rupture, and ascites formation.[10] Hepatic dysfunction, whether acute or undiagnosed chronic liver disease, may manifest during the postpartum period, particularly in individuals with predisposing factors. Portal hypertension, a common consequence of liver dysfunction, increases hydrostatic pressure and causes fluid transudation into the peritoneal cavity, often resulting in ascites with a low serum-ascites albumin gradient (SAAG).[9] Malignancy, though rare, can also contribute to postpartum ascites. Conditions such as ovarian cancer, including peritoneal carcinomatosis, may present during or after pregnancy. These cases typically result in massive ascites with high protein content and positive cytology findings in the ascitic fluid. Identifying malignancy as a cause requires thorough diagnostic evaluation.[10]

Mechanical factors can also lead to postpartum ascites like Prolonged labor, cesarean delivery, or pelvic surgery that may cause peritoneal irritation or injury, triggering reactive ascites due to localized inflammation and fluid exudation.[11]

In this case, the milky ascitic fluid, leukocytosis, elevated CRP, and neutrophil predominance strongly suggested an infectious etiology, likely bacterial peritonitis. The prompt initiation of empiric antibiotics (ceftriaxone and metronidazole) and supportive care played a critical role in stabilizing the patient. Postpartum peritonitis, though rare, is a recognized complication following delivery and requires early diagnosis and treatment to prevent significant morbidity.[12]

The progression of the condition with worsening leukocytosis and abdominal distension despite initial treatment necessitated further imaging and intervention. CT imaging revealed thickened peritoneal walls, a finding consistent with peritoneal inflammation. Escalation to piperacillin-tazobactam addressed the possibility of resistant or polymicrobial infections, which are not uncommon in postpartum sepsis.[13] Continuous drainage of ascitic fluid via a pigtail catheter, along with albumin infusions, contributed to the resolution of ascites and improved clinical outcomes.

The use of albumin before and after paracentesis was critical in maintaining hemodynamic stability and preventing complications such as paracentesis-induced circulatory dysfunction (PICD), which is a well-documented concern in large-volume paracentesis.[14] Prolonged drainage via a pigtail catheter over six weeks allowed gradual fluid removal, minimizing the risk of electrolyte imbalances and other adverse effects. This approach aligns with best practices for managing refractory ascites and peritoneal infections.[15]

This case underscores the importance of a systematic approach to postpartum ascites, which involves ruling out common etiologies such as tuberculosis, malignancy, and preeclampsia while aggressively managing suspected bacterial peritonitis. It also demonstrates the value of continuous drainage in cases of massive ascites refractory to initial medical therapy.

Several studies have reported similar presentations of postpartum ascites, linking it to infectious, inflammatory, or preeclampsia-related causes. A study of Postpartum tuberculous peritonitis documented a case of postpartum ascites secondary to disseminated tuberculosis, where the patient presented with fever, abdominal distension, and weight loss, highlighting the diagnostic challenges in endemic areas.[8] Similar study presented a case of postpartum spontaneous bacterial peritonitis (SBP) in a patient with undiagnosed chronic liver disease, emphasizing the need for early recognition and intervention to prevent maternal morbidity.[9] Another case report demonstrated massive ascites due to HELLP syndrome (Hemolysis, Elevated Liver enzymes, and Low Platelets), emphasizing the importance of considering pre-eclampsia-related complications.[16] These studies highlight the diverse etiologies and diagnostic complexities associated with postpartum ascites.

A thorough diagnostic approach is essential in identifying the underlying cause of postpartum ascites. The initial evaluation should include an abdominal ultrasound, which is a non-invasive and readily available imaging modality capable of detecting the presence of ascites and assessing its characteristics. In this case, ultrasound revealed ascites with thick septations, suggesting a potential infectious or inflammatory process.

For further assessment, computed tomography of the abdomen and pelvis is recommended when ultrasound findings are inconclusive or when more detailed imaging is required to evaluate peritoneal involvement. Computed tomography provides a more comprehensive view of the abdominal cavity, detecting signs of peritoneal thickening, organ involvement, and possible malignancy. In this case, computed tomography imaging demonstrated massive ascites with thickened, enhancing peritoneal walls but showed no evidence of any other infectious source within the peritoneal cavity.

In addition to imaging, laboratory investigations play a crucial role in narrowing down the differential diagnosis. Blood tests revealed leukocytosis and elevated C-reactive protein, indicating an inflammatory or infectious process.

Analysis of the ascitic fluid is critical for classification and further evaluation. The results, in this case, demonstrated a high total protein level, suggesting an exudative process. Low triglyceride and low albumin levels helped rule out chylous ascites and hypoalbuminemia-related transudate. Normal glucose and amylase levels made infectious peritonitis and pancreatic ascites less likely. The Gen expert test was negative, ruling out tuberculosis. No bacterial growth and negative cytology results reduced suspicion for bacterial peritonitis or malignancy.

By integrating imaging findings with laboratory and ascitic fluid analysis, clinicians can systematically determine the etiology of postpartum ascites and guide appropriate management and treatment.

In severe cases of postpartum ascites, multiple paracentesis procedures may be necessary to fully drain fluid, alleviate symptoms, and prevent serious complications such as hemoconcentration, hypotension, reduced renal perfusion, and significant respiratory issues. Using a catheter instead of performing several needle paracentesis procedures allows for complete drainage with a single intervention. Pigtail catheters have been successfully employed in various medical situations, including draining pleural effusion,[17] pericardial effusion,[18] abdominal abscesses[19] and fluid collections in acute pancreatitis.[20] They have also been utilized as central venous,[21] nephrostomy tubes,[22] and biliary stents.[23,24]

Percutaneous pigtail catheters represent a minimally invasive, image-guided standard of care for the drainage of symptomatic fluid collections within the abdomen and pelvis, these devices offer considerable advantages over larger-bore surgical drains, including a reduced risk of procedure-related complications such as visceral organ injury or hemorrhage, enhanced patient tolerance and comfort, and the capability for either continuous or intermittent drainage.[25] In our case, the placement of a pigtail catheter facilitated continuous and controlled drainage of ascitic fluid. This approach is particularly critical in the management of high-output ascites, as the gradual decompression prevents the rapid fluid shifts associated with large-volume paracentesis. By mitigating these shifts, percutaneous drainage with a pigtail catheter serves as a key strategy in preventing paracentesis-induced circulatory dysfunction (PICD).[26]

The standard management of ascites is primarily medical, centering on sodium restriction and diuretic therapy, particularly for cases of cirrhotic or cardiac origin.[27] In instances of large-volume, symptomatic, or refractory ascites, large-volume paracentesis (LVP) serves as the cornerstone interventional procedure. However, the necessity for repeated LVPs presents significant challenges; the procedure is inherently invasive, carries cumulative risks of infection and bleeding, and imposes a substantial burden on patient quality of life due to its repetitive and inconvenient nature.[28]

Indwelling peritoneal catheters, including non-tunneled pigtail and tunneled catheters are well-established therapeutic alternatives for malignant ascites. Their use is increasingly considered for refractory benign ascites when frequent LVPs are required, offering a sustainable method for ambulatory fluid management.[29] In contrast, the application of this technology for the management of postpartum ascites falls outside standard protocols and is scarcely documented in the extant literature. This case, therefore, presents a salient illustration of the adaptation of an established interventional radiological technique to address a novel and complex obstetric complication.

The clinical outcomes achieved, marked symptomatic relief, avoidance of repeated invasive procedures, and transition to successful outpatient management, are consistent with the documented efficacy of pigtail catheters in managing malignant ascites and other refractory effusions.[30,31] This case is distinguished by the application of this interventional strategy to postpartum ascites, a condition whose pathophysiology is distinct from the oncologic or cirrhotic processes typically underlying refractory ascites.

Furthermore, the successful deployment of this technique in a resource-limited setting, such as Somalia, underscores its practical utility. It offers a viable and sustainable management model for comparable environments where access to frequent paracentesis or advanced surgical intervention is constrained.

The limitation of this case study is the lack of definitive microbiological or histopathological confirmation of the etiology, which is a common challenge in resource-limited settings. While the clinical picture strongly suggested bacterial peritonitis, cultures were not obtained, and tuberculosis could not be fully ruled out without more advanced testing (eg, peritoneal biopsy or adenosine deaminase testing), finally, the generalizability of these findings is limited by the inherent constraints of a single-case report.

The uniqueness of this case report is twofold. Primarily, it contributes to the medical literature by detailing the management of a highly rare obstetric complication. Of greater significance, however, it demonstrates the successful adaptation and implementation of a standard interventional radiology procedure, percutaneous pigtail catheter drainage, for a novel clinical indication (refractory postpartum ascites) within a resource-constrained setting. This highlights a model of care that emphasizes procedural versatility and multidisciplinary collaboration to overcome significant diagnostic and therapeutic challenges where conventional management strategies are impractical or unavailable.

Follow-up is done clinically and by periodic ultrasound, which is readily available noninvasive method and do not pose radiation risk. CT scan is used in cases that need further determination of etiology, to guide safety and efficacy of

therapeutic interventions and in cases of deterioration or development of new symptoms. Early diagnosis and the effective early intervention, which includes appropriate antibiotic therapy and supportive therapy, and the implementing interventional radiology techniques in managing complex postpartum ascites will lead to favorable outcome in most cases.

Conclusion

This case report demonstrates that percutaneous pigtail catheter drainage is a viable, minimally invasive therapeutic strategy for managing massive refractory postpartum ascites, a rare and complex obstetric condition. Its successful implementation in a resource-limited setting highlights its practicality where frequent paracentesis or surgical intervention may be unavailable or high-risk. The technique serves as an effective bridge to recovery, reducing the need for repeated invasive procedures, minimizing the risk of complications such as infection or bleeding, and avoiding prolonged hospitalization. Furthermore, this case supports the early involvement of interventional radiology in multidisciplinary obstetric care and may inform future treatment protocols for similar complex presentations in constrained healthcare environments.

Abbreviations

CT, computed tomography; USG, Ultrasonography; GCS, Glasgow Coma Scale; SAAG, serum-ascites albumin gradient; CRP, C-reactive protein; PICD, paracentesis induced circulatory dysfunction.

Ethics and Consent

A Written consent form was attained from the patient for publication of this case report and the attaching images. In our institution, ethical approval is not required for case reports.

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Disclosure

The authors declare that there are no financial or conflicts of interest in this case report.

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