

Multiseptated Gall Bladder in Children: Case Report

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Abstract: The multiseptated gallbladder, a rare congenital anomaly characterized by multiple internal septa, is especially uncommon in children and often poses significant diagnostic challenges due to its nonspecific symptoms. We present a 10-year-old female with intermittent right upper quadrant abdominal pain and nausea. Initial ultrasound revealed a multicystic lesion associated with the gallbladder, prompting further evaluation with MRI and MRCP. Advanced imaging confirmed a multiseptated gallbladder with no biliary obstruction. Laboratory investigations ruled out urinary and systemic infections but identified a moderate growth of *Klebsiella pneumoniae* in the vulval culture. Conservative management was initially considered, but due to recurrent pain, laparoscopic cholecystectomy was performed, revealing multiple internal septations. This case highlights the importance of considering congenital anomalies in pediatric biliary symptoms. MRI and MRCP are crucial for accurate diagnosis, and laparoscopic cholecystectomy effectively alleviates symptoms. This case emphasizes the need for awareness of rare gallbladder anomalies in clinical practice.

Keywords: Congenital, Gallbladder, Multiseptated, Pediatric, Cholecystectomy

1. Introduction

The gallbladder, a diminutive organ situated below the liver, is crucial to the digestive process as it stores and concentrates bile produced by the liver. While uncommon, abnormalities in gallbladder morphology can have considerable clinical consequences, especially in children. (1). Among these anomalies, the multiseptated gallbladder is an unusual congenital condition characterized by the presence of multiple internal septa, dividing the gallbladder into several compartments. This condition is exceptionally rare, with limited cases reported in the literature, particularly among children (2).

The clinical presentation of a multiseptated gallbladder can vary widely, ranging from asymptomatic cases discovered incidentally during imaging for unrelated issues to symptomatic presentations involving abdominal pain, nausea, vomiting, and, in some cases, jaundice (3). These symptoms often mimic more common biliary pathologies, such as cholelithiasis or cholecystitis, complicating the diagnosis. Advanced imaging techniques, including ultrasound and magnetic resonance cholangiopancreatography (MRCP), are crucial for accurate diagnosis, allowing for detailed visualization of the gallbladder's internal architecture (4).

This case report describes a pediatric patient with a multiseptated gallbladder, detailing its clinical presentation, diagnostic process, and surgical management. It emphasizes the importance of considering congenital gallbladder anomalies in the differential diagnosis of biliary symptoms in pediatric patients.

2. Case Presentation

2.1 Clinical History

A 10-year-old female patient reported primarily experiencing abdominal pain. The pain was intermittent, situated in the upper right quadrant of the abdomen, and sometimes associated with nausea. There was no history of jaundice, fever, or notable weight loss. The patient's medical history was unremarkable, with no previous occurrences of similar symptoms. Physical examination indicated mild tenderness in the right upper quadrant, without any palpable masses or signs of acute abdomen.

2.2 Ultrasound Examination

During the initial evaluation, an ultrasound examination of the abdomen was performed to investigate the underlying cause of the patient's abdominal pain. The liver was of normal size and echogenicity, with no focal lesions detected, as shown in Figure 1.

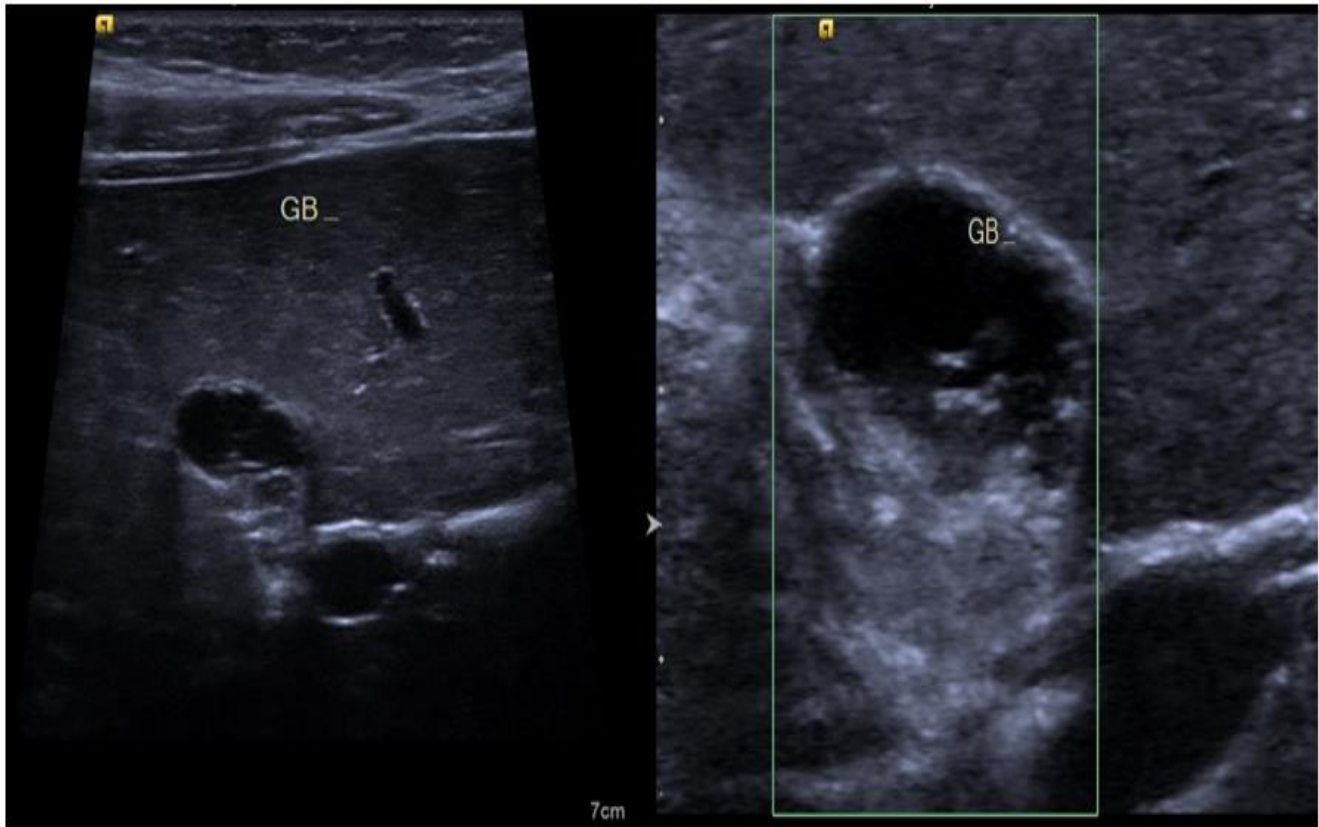


Figure 1: Abdomen Ultrasound Imaging

The portal and hepatic veins appeared normal, and there was no evidence of intrahepatic biliary radicle (IHBR) dilatation. The gallbladder presented a multicystic lesion measuring 19x12mm, which could not be separated from the gallbladder wall on ultrasound, indicating a potential congenital anomaly. The lumen of the gallbladder was partially contracted, and no vascularity was observed on Doppler imaging. Importantly, no calculi were identified within the lumen. The common bile duct (CBD) in the visualized segment was unremarkable, showing no signs of obstruction or abnormality. The aorta and inferior vena cava were both normal. The pancreas was normal size and echogenicity, though bowel gases limited its full assessment. The spleen appeared normal in size, position, and echogenicity. Both kidneys demonstrated normal size, position, and configuration with preserved cortical thickness, echogenicity, and cortical-medullary differentiation.

There was no evidence of calculus or hydronephrosis in either kidney, with the right kidney measuring 9x3 cm and the left kidney measuring 9x4 cm. Additionally, no abnormal lymph nodes were detected, and no localized intra-abdominal fluid collections were present. These findings suggested a multicystic lesion associated with the gallbladder, raising the possibility of a cystic lymphangioma. Further evaluation with MRI and MRCP was advised to differentiate this lesion from other potential pathologies and to provide a more detailed anatomical assessment, as shown in Figure 2.

ULTRASOUND ABDOMEN

Clinical History: pain abdomen

Findings:

Liver is normal in size and shows normal echogenicity. No focal lesion seen. Portal vein and hepatic veins appear normal. No IHBR dilatation.

Gallbladder -Multicystic lesion is seen in relation to GB measuring 19x12mm and cannot be separated from its wall on ultrasound. Lumen is partially contracted.

No vascularity seen on Doppler

No calculi seen in lumen

CBD -visualised part is unremarkable

Aorta is unremarkable

Inferior vena cava is unremarkable

Pancreas shows normal size and echogenicity. Partially obscured by bowel gases

Spleen has normal size position and echogenicity.

Both kidneys show normal size, position and configuration. Preserved cortical thickness, echogenicity, cortical-medullary differentiation and fatty hila. No calculus or hydronephrosis on either side.

Right kidney measures 9x3cm.

Left kidney measures 9x4cm.

No abnormal nodes seen

No evidence localized intra-abdominal fluid collection.

Impression:

Multicystic lesion in relation to GB and cannot be separated from its wall

Possibility of cystic lymphangioma of GB

Advised MRI with contrast and MRCP for further evaluation and to differentiate from other pathologies

Figure 2: Abdomen Ultrasound Report

The ultrasound findings suggested a multicystic lesion related to the gallbladder that could not be separated from its wall. A differential diagnosis included cystic lymphangioma of the gallbladder. Further evaluation with MRI and MRCP was advised to differentiate this from other pathologies.

2.3 Laboratory Investigations

2.3.1 Gram Stain and Culture

The gram stain and culture were performed to identify any bacterial presence that might contribute to the patient’s symptoms. The direct smear from the gram stain revealed moderate epithelial cells, occasional pus cells, occasional gram-positive bacilli, occasional gram-negative bacilli, and many gram-positive cocci in pairs and clusters. These findings suggest a mixed bacterial presence, indicating a potential infection that might require further analysis to determine the specific pathogens involved and their sensitivity to antibiotics, as shown in Figure 3.

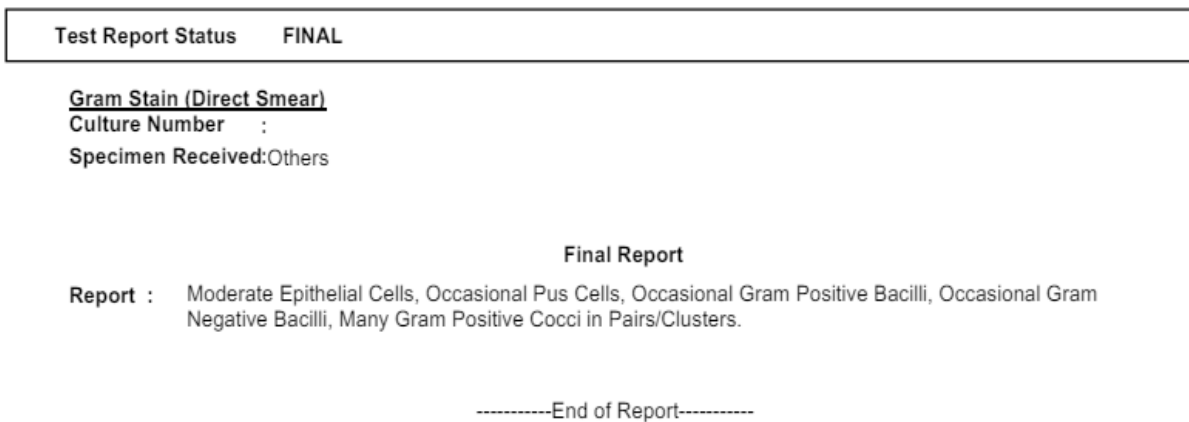


Figure 3: Gram Stain and Culture Report

2.3.2 Urine Analysis

A comprehensive urine analysis was conducted to evaluate the patient's urinary system for signs of infection, inflammation, or other abnormalities. The urine sample appeared pale yellow and clear, with a pH of 7, within the normal range of 4.8 to 7.5. The specific gravity was 1.009, also within the normal range of 1.003 to 1.030, indicating proper kidney function. The urine tested negative for leucocyte esterase, blood, glucose, protein, bilirubin, and ketones. Urobilinogen levels were normal. Microscopic examination showed 0-1 leukocytes (pus cells) per high power field (hpf), 0-1 erythrocytes (RBCs) per hpf, and no epithelial cells, casts, crystals, or significant bacteria, indicating an absence of active infection or considerable pathology within the urinary tract, as shown in Figure 4.

Test Report Status FINAL						Test Report Status FINAL					
Test Name	Result	Flag	Unit	Normal Range	Method	Test Name	Result	Flag	Unit	Normal Range	Method
Path Microbiology											
Urine analysis and Microscopy											
Colour	PALE YELLOW					Nitrites_U	NEGATIVE				
Appearance	CLEAR					Leukocytes (Pus cells)	0-1		/hpf	0 - 5	
pH	7			4.8 - 7.5		Erythrocytes (RBCs)	0-1		/hpf	0 - 3	
Specific Gravity	1.009			1.003 - 1.030		Epithelial cells	NIL		/hpf		
Leucocyte Esterase	NEGATIVE					Casts	NIL		/hpf		
Blood	NEGATIVE					Crystals	NIL		/hpf		
Glucose	NORMAL					Bacteria	OCCASIONAL		hpf		
Protein	NEGATIVE					Others	NIL		hpf		
Bilirubin	NEGATIVE					-----End of Report-----					
Urobilinogen	NORMAL										
Ketone	NEGATIVE										

Figure 4: Urine Analysis Report

2.3.3 Urine Culture and Sensitivity

A urine culture and sensitivity test were performed to further assess for urinary tract infection. The specimen showed no bacterial growth after 2 days of incubation, indicating the absence of a urinary tract infection at the testing time. This result aligns with the findings of the urine analysis, which showed no significant abnormalities or presence of pathogens. The lack of bacterial growth suggests that the urinary tract is not the source of the patient's abdominal pain, as shown in Figure 5.

Test Report Status FINAL	
<u>Aerobic-Microscopy : Culture & Sensitivity : Urine</u>	
Culture Number	:
Specimen Received:	Urine
Final Report	
Report :	No Growth After 2 Days.
-----End of Report-----	

Figure 5: Urine Culture and Sensitivity Report

2.3.4 Vulval Culture and Sensitivity

A vulval swab culture was conducted to identify potential pathogens in the vulval area. The final report indicated a moderate growth of Klebsiella pneumoniae. Antibiotic sensitivity testing revealed that the isolated Klebsiella pneumoniae was sensitive to amoxicillin/clavulanic acid, cefixime, ceftriaxone, gentamicin, and trimethoprim/sulfamethoxazole. The report noted that Klebsiella pneumoniae is intrinsically resistant to ampicillin and ticarcillin. Additionally, isolates sensitive to cefazolin were also sensitive to oral agents such as cefaclor, cefdinir, cefpodoxime, cefprozil, cefuroxime, and cephalexin, which are effective for uncomplicated urinary tract infections caused by Klebsiella pneumonia, as shown in Figure 6.

Test Report Status FINAL		
Culture & Sensitivity : Vulval		
Culture Number :		
Specimen Received: Swab		
Specimen Source : Swab	Specimen Site : Vulval	
Final Report		
Isolation	: Moderate growth of Klebsiella pneumoniae	
<u>Klebsiella pneumoniae</u>		
Antibiotic	MIC	Interpretation
Amoxicillin/Clavulanic Acid		Sensitive
Cefixime		Sensitive
Ceftriaxone		Sensitive
Gentamicin		Sensitive
Trimethoprim/Sulfamethoxazole		Sensitive
Comment:		
<ul style="list-style-type: none"> •Klebsiella pneumoniae is intrinsically resistance to Ampicillin and Ticarcillin. •Isolates Sensitive to Cefazolin are also sensitive to oral agents Cefaclor, Cefdinir, Cefpodoxime, Cefprozil,Cefuroxime,Cephalexin for Uncomplicated UTI due to Klebsiella pneumoniae. •Ureaplasma, Mycoplasma and Chlamydia are not detected with conventional media. •Quality controls for organisms are routinely performed using recommended ATCC strains. <p style="text-align: center;">-----End of Report-----</p>		

Figure 6: Vulval Culture and Sensitivity

2.4 MRI and MRCP

Given the ultrasound findings, an MRI with contrast and MRCP was performed to gain a more detailed view of the gallbladder and associated structures. These imaging modalities are essential for differentiating between various potential diagnoses, such as cystic lymphangioma, choledochal cysts, or other congenital anomalies of the biliary tract, as shown in Figure 7.

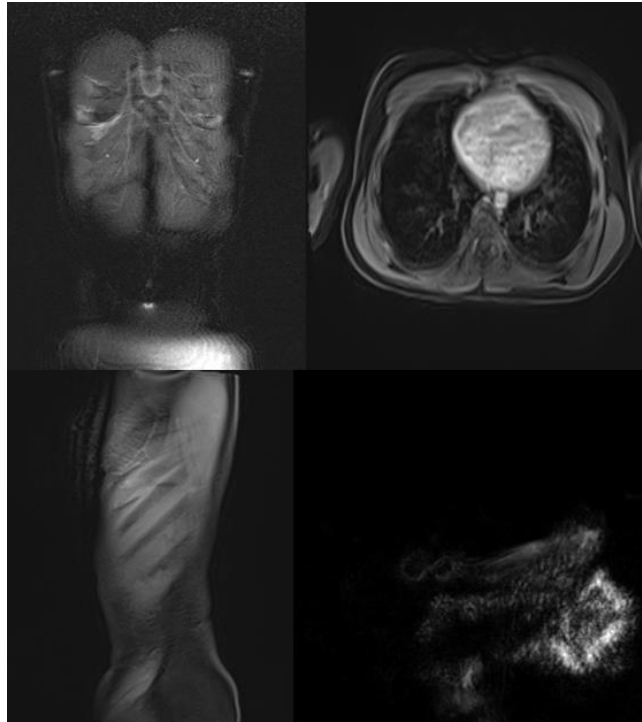


Figure 7: MRI and MRCP Imaging

The MRI confirmed the presence of a multicystic lesion intimately associated with the gallbladder wall. The detailed images provided by MRCP helped delineate the gallbladder's internal architecture, which revealed multiple septations consistent with a multiseptated gallbladder. No evidence of obstruction in the biliary tree or other anomalies in the liver, pancreas, or surrounding structures was noted.

2.5 Diagnosis

Based on the imaging studies and the clinical presentation, the patient was diagnosed with a multiseptated gallbladder. This congenital anomaly, though rare, was identified as the cause of the patient's abdominal pain.

2.6 Conservative Management

Given that the patient's symptoms were manageable and there were no signs of acute complications such as cholangitis or significant biliary obstruction, a conservative approach was initially considered. This included pain management, dietary modifications, and close monitoring of symptoms.

2.7 Surgical Intervention

Due to the recurrent nature of the abdominal pain and the potential risk of complications associated with a multiseptated gallbladder, surgical intervention was recommended. The decision was made to proceed with laparoscopic cholecystectomy, a minimally invasive procedure that would allow for the removal of the gallbladder and resolution of the patient's symptoms.

2.8 Surgical Findings and Procedure:

During the laparoscopic cholecystectomy, the gallbladder was found to be partially contracted, with multiple internal septations visible. The surgery was performed without complications, and the gallbladder was successfully removed.

2.9 Postoperative Course

The patient's postoperative course was uneventful. She was monitored for signs of infection, bile leakage, or any other complications. Pain management was effectively achieved with analgesics, and the patient could resume a normal diet within a few days following the surgery. Follow-up visits confirmed the resolution of abdominal pain, and no further biliary symptoms were reported.

3. Discussion

The multiseptated gallbladder is a rare congenital anomaly characterized by multiple internal septations within the gallbladder lumen. This case report describes the clinical presentation, diagnostic process, and management of a 10-year-old female patient with a multiseptated gallbladder. The findings from this case provide valuable insights and can be compared with previous studies to better understand the clinical implications, diagnostic challenges, and management strategies for this condition.

The presentation of our case aligns with the findings of a study by Wanaguru et al. (2011), which documented the clinical and radiological features of multiseptated gallbladders in pediatric patients. In their research, similar to our findings, patients commonly presented with abdominal pain localized to the upper right quadrant. Using ultrasound as the initial diagnostic tool was emphasized, revealing multiple cystic structures within the gallbladder, resembling our ultrasound findings of a multicystic lesion measuring 19x12mm (5). In our case, the gallbladder's partial contraction and the calculi's absence further align with their observations.

Furthermore, the use of advanced imaging techniques such as MRI and MRCP, as performed in our case, was highlighted in Wanaguru et al. (2011) study as crucial for accurately diagnosing multiseptated gallbladder. These modalities provide detailed visualization of the gallbladder's internal architecture, confirming the presence of multiple septations and ruling out other potential pathologies like choledochal cysts or biliary atresia (5). The MRI findings in our case, which confirmed the multicystic lesion's association with the gallbladder wall and the absence of biliary tree obstruction, corroborate these insights.

Another pertinent study by Pineda et al. (2017) provided a comprehensive review of the surgical management of multiseptated gallbladders. Their analysis highlighted that conservative management might be sufficient for asymptomatic cases or those with mild symptoms. However, for patients with recurrent or severe symptoms, as seen in our patients, surgical intervention is often necessary to alleviate symptoms and prevent complications; this case also documented several instances in which laparoscopic cholecystectomy was successfully performed, resulting in symptom resolution and minimal postoperative complications (6). Our case, where the patient underwent laparoscopic cholecystectomy with successful removal of the gallbladder and resolution of symptoms, mirrors their findings and reinforces the efficacy of this surgical approach.

The diagnosis of a multiseptated gallbladder poses several challenges, primarily due to its rarity and the nonspecific nature of its symptoms, which often mimic more common biliary disorders. The initial ultrasound findings in our case, showing a multicystic lesion that could not be separated from the gallbladder wall, were crucial in raising suspicion for this anomaly. The subsequent MRI and MRCP provided detailed insights into the internal structure of the gallbladder, confirming the presence of multiple septations and aiding in the definitive diagnosis.

Our case also underscores the importance of considering congenital anomalies in the differential diagnosis of pediatric patients presenting with biliary symptoms. While conditions like cholelithiasis and cholecystitis are more common, recognizing and accurately diagnosing rare anomalies like the multiseptated gallbladder is essential for appropriate management. The literature supports using advanced imaging techniques for this purpose, as they provide comprehensive anatomical details that are only sometimes apparent on ultrasound alone (5, 6).

The decision to opt for surgical management in our case was guided by the recurrent nature of the patient's symptoms and the potential risks associated with a multiseptated gallbladder, such as bile stasis, infection, and cholecystitis. The successful outcome of the laparoscopic cholecystectomy in our patient was complete symptom resolution and an uneventful postoperative course (6). Their study highlighted laparoscopic cholecystectomy's

minimal invasiveness, safety, and efficacy in managing symptomatic multiseptated gallbladders, further validating our approach.

4. Conclusion

This case report underscores the diagnostic challenges and successful management of a rare multiseptated gallbladder in a pediatric patient, highlighting the importance of advanced imaging techniques like MRI and MRCP for accurate diagnosis. The report validates laparoscopic cholecystectomy as an effective treatment for symptomatic relief, emphasizing the need to consider congenital anomalies in pediatric biliary symptom cases.

Acknowledgments

None.

Conflict of Interest

The author(s) declares no conflict of interest.

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None.

Consent Statement

Informed consent was obtained from the participant.

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