Fellow Column: Pediatric Multiseptate Gallbladder - Case Report

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Abstract

Multiseptate gallbladder (MSG) is a rare congenital anomaly characterized by abnormal partial internal divisions of the gallbladder. Clinical presentation spans from asymptomatic to biliary symptoms such as nausea, vomiting, and right upper quadrant abdominal pain. The literature regarding this anomaly is limited, with only a few reported cases in the pediatric population.

Here we present the case of a full-term, otherwise healthy girl who has had recurrent episodes of diarrhea, since two months of age, and on a hospital admission at 11 weeks, was found, on a right upper quadrant ultrasound, to have MSG, with otherwise normal extrahepatic duct anatomy. She has been followed since discharge with repeated ultrasounds and liver function tests and has remained asymptomatic.

As long as she remains asymptomatic with stable ultrasound and normal liver function tests, and has no associated symptoms, we will continue to manage her nonoperatively.

Keywords: multiseptated gallbladder, pediatric, congenital anomaly

Introduction

Multiseptate gallbladder is a rare congenital anomaly, scarcely reported in children. MSG is most commonly characterized by its honeycomb appearance, which results from multiple thin septations (1,2). It most likely results from incomplete vacuolization of the developing gallbladder bud or persistent “wrinkling” of the gallbladder wall. (3-5) The amount of gallbladder involvement by the septae varies from those limited to only one area of the gallbladder, to the involvement of the entire lumen. Within this anomaly, there is a female predominance, with a reported female to male ratio of 1:2 (1).

Most of the cases of MSG are reported in adults and are diagnosed around the time of symptoms onset. Asymptomatic pediatric reports are rare, and management is not clearly defined.

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Case Report

The patient is a 17-month old girl born at 38 weeks gestation via cesarean section, birth weight 3118 grams. Her mother had gestational diabetes. After a murmur was detected, she was found on echocardiography to have mild supravalvular pulmonary valve stenosis, patent foramen ovale, and small patent ductus arteriosus, which closed by five months of age. Additional medical problems include cow milk intolerance and gastroesophageal reflux (chronic vomiting). She was admitted to the hospital for diarrhea at 11 weeks of age and treated for dehydration. During this hospitalization, a right upper quadrant ultrasound was performed, demonstrating gallbladder septations, with otherwise normal extrahepatic ductal anatomy. (Figure 1) Her liver function tests were normal, with a total bilirubin level of 0.1 mg/dL. The patient was seen in the clinic at five months of age with a repeat right upper quadrant ultrasound that re-demonstrated the previous findings of a septated gallbladder. A subsequent clinic visit at 17 months was normal, with appropriate growth and development. She remains asymptomatic, and follow-up is planned annually, with ultrasound and liver function tests.

“ Variant imaging modalities can be used to diagnose MSG ranging from ultrasound (US) to magnetic resonant cholangiography (MRCP). US was used in our case because of its safety and accessibility, without requiring sedation for this young child."

Title	Authors	Year	Patient age	Management
Multiseptated Gallbladder: A Case of Recurrent Abdominal Pain in Childhood	Haslam et al. (4)	1966	15.5 years	Cholecystectomy
Ultrasonic appearance of multiseptate gallbladder: report of a case with coexisting choledochal	Pery et al. (7)	1985	8 years	Cholecystectomy & choledochoduodenostomy
The multiseptate gallbladder. A rare malformation of the biliary tract	Fremond et al. (8)	1989	13 years	Cholecystectomy
Multiseptate gallbladder in a child: incidental diagnosis on sonography	Adear et al. (9)	1990	12 years	Non-operative
Partial multiseptate gallbladder: sonographic appearance	Straus et al. (10)	1993	3,9,16 years	Not detailed
Non-communicating multiseptate gall bladder and choledochal cyst: a case report and review of publications	Tan et al. (11)	1993	14 years	Cholecystectomy & hepatojejunostomy
Multiseptate gallbladder in a child with chronic abdominal pain: ultrasonography, magnetic resonance imaging, and magnetic resonance cholangiography findings	Kocakoc et al. (12)	2003	9 years	Cholecystectomy
Clinical and ultrasonographical findings in patients with multiseptate gallbladder	Erdogemus et al. (13)	2004	10, 12 years	Cholecystectomy
Ectopic pancreas associated with choledochal cyst and multiseptate gallbladder	Bhadir et al. (14)	2006	15 days	Excision of cyst with Roux-en-Y anastomosis
Multiseptate gallbladder in a child with recurrent abdominal pain	Demirpolat et al. (15)	2010	5 years	Non-operative
Multiseptate Gallbladder in an Asymptomatic Child	Wanaguru et al.(1)	2011	9 months	Non-operative
Multiseptate Gallbladder: Clinical and Ultrasonographic follow-up for 12 Years	Geremia et al. (16)	2013	12 Years	Non-operative
Multiseptate Gallbladder in an Asymptomatic Pediatric Patient	Ortola et al. (17)	2015	5 months	Non-operative
A Multiseptate Gallbladder in a 16-Year-Old Boy with Abdominal Pain	Edelman et al. (2)	2016	16 years	Cholecystectomy
Multiseptate Gallbladder in a Child: A Possible Cause of Poor Growth?	Mendola et al. (18)	2017	3 years	Cholecystectomy
Laparoscopic Cholecystectomy for Symptomatic Multiseptate Gallbladder	Sabra et al. (19)	2017	12 years	Cholecystectomy
Multiseptate Gallbladder in a Child	Bertozzi et al. (20)	2019	7 years	Cholecystectomy

Table 1. Reported cases of pediatric MSG as well as management strategies

Discussion

The first report of MSG was described by Simon and Tandon in 1963, in which they documented that the septation of the gallbladder results from the incomplete cavitation of the developing gallbladder buds, leaving the lumen divided (6).

Other theories have been postulated by Bhagavan et al. [5] suggesting that MSG may be a result of the solid embryonic gallbladder growing faster than its bed and investing peritoneum, causing aberrant bends and kinks, in addition to possible wrinkling, lobulation, and clefting of the gallbladder that may result in multiseptation. (1)

There are only a handful of such reports on pediatric patients, and two previous cases reported amongst children less than one year of age. The management described ranged from nonoperative with observation, to cholecystectomy in older children. [table 1]

Asymptomatic patients are very rare in literature, and more so

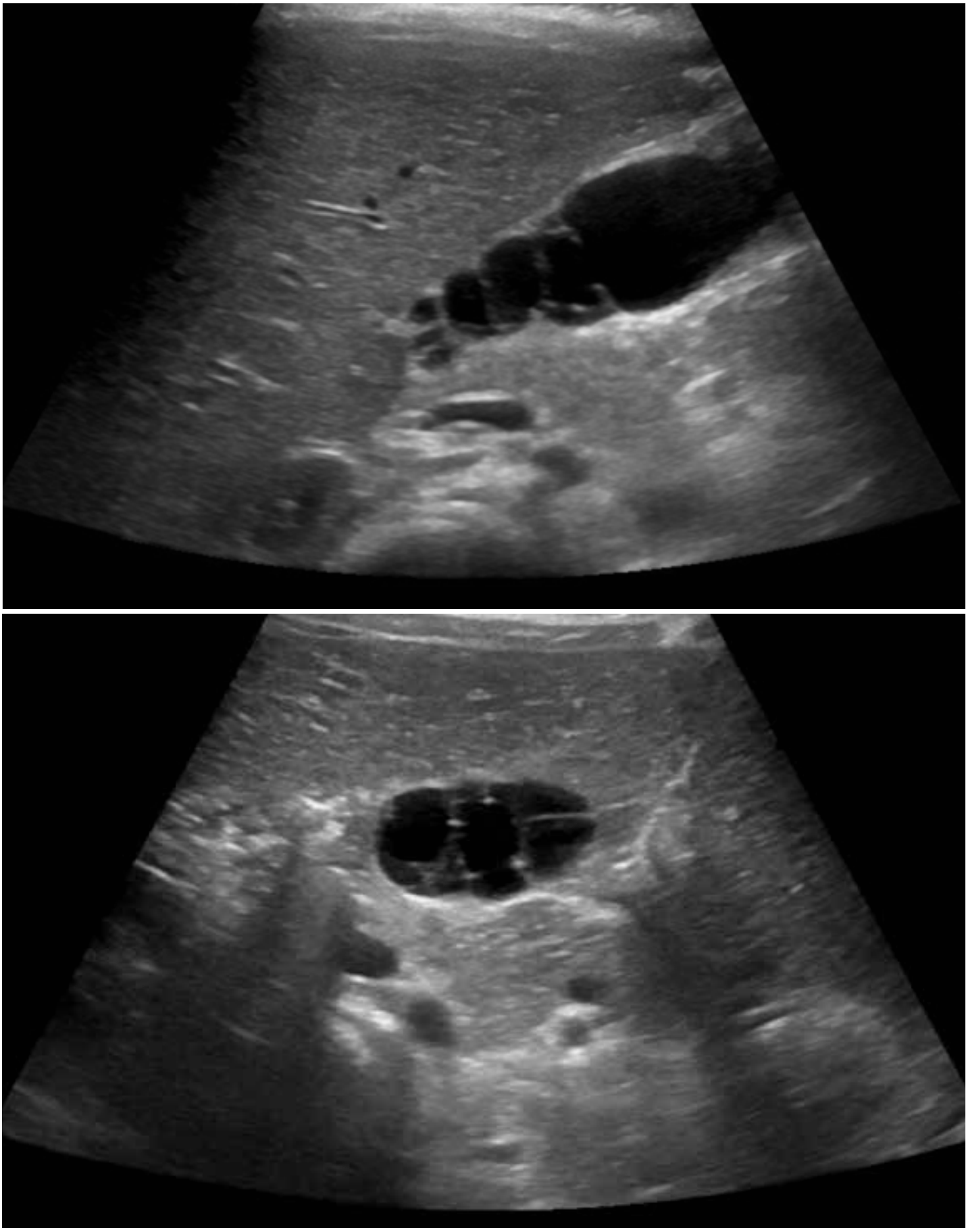

Figure 1 (page 10). Ultrasound of MSG showing multiple thin internal septations with a honey- comb appearance

amongst pediatric patients. Most patients present later in life with long-term abdominal symptoms such as recurrent right upper quadrant or epigastric pain, nausea and vomiting, and gastrointestinal complaints. Septa of the gallbladder are hypothesized to cause impaired gallbladder motility, leading to stasis of bile flow. This stasis may lead to the symptoms described above. (3)

Variant imaging modalities can be used to diagnose MSG ranging from ultrasound (US) to magnetic resonant cholangiography (MRCP). US was used in our case because of its safety and accessibility, without requiring sedation for this young child. MRCP has the advantage of better delineating the biliary tree and excluding associated bile duct anomalies, which are of importance for future surgical planning. There is no reported association between uncomplicated MSG and malignancy, despite the known link between biliary tract anomalies and cholangiocarcinoma. (1)

Of the 20 reported cased in the pediatric population, eight had cholecystectomy for symptoms related to MSG, three had associated choledochal cysts and were successfully treated with excision of the extrahepatic biliary tree combined with hepatojejunostomy or choledochoduodenostomy, and five children with uncomplicated and asymptomatic MSG, management was non-operative with long term follow up.[table 1] Just as in our case, patients under one year of age were all managed non-operatively with long-term follow up.

Conclusion

Multiseptated gallbladder is a very rare congenital anomaly found incidentally in the neonate population. Observation is the common management strategy in younger children, and in the presence of symptoms, cholecystectomy is advised in the teenage population.

References

1. *Wanaguru D, Jiwane A, Day AS, Adams S. Multiseptate gallbladder in an asymptomatic child. Case Rep Gastrointest Med. 2011;2011:470658. doi:10.1155/2011/470658*
2. *Edelman M, Chawla A, Gill R. A Multiseptated Gallbladder in a 16-Year-Old Boy with Abdominal Pain. Journal of Pediatric Gastroenterology and Nutrition.2016;62(4):33. doi: 10.1097/mpg.0000000000000418*
3. *Karaca T, Yoldas O, Bilgin BC, Bilgin S, Evcik E, Ozen S. Diagnosis and Treatment of Multiseptated Gallbladder with Recurrent Abdominal Pain. Case Reports in Medicine. 2011;2 pages. doi: 10.1155/2011/162853*
4. *Haslam RH, Gayler BW, Elbert PA. Multiseptated gallbladder. A cause of recurrent abdominal pain in childhood. American Journal of Diseases of Children. 1996;112(6):600. doi: 10.1001/archpedi.1966.02090150144021*
5. *Bhagavan BS, Amin PB, Land AS, Weinberg T. Multiseptated gallbladder. Embryogenetic hypotheses. Archives of Pathology. 1970;89(4):382-385.*
6. *Simon M, Tandon BN. Multiseptated Gallbladder. Radiology. 1963;80(1):84-86. doi: 10.1148/80.1.84*
7. *Pery M, Kaftori JK, Marvin H, Sweed Y, Kerner H. Ultrasonographic appearance of multiseptate gallbladder: Report of a case with coexisting choledochal cyst. Journal of Clinical Ultrasound. 1985;13(8):570-573. doi: 10.1002/1097-0096(199010)13:8<570::aid-jcu1870130810>3.0.co;2-h*
8. *Fremond B, Stasik C, Jouan H, et al. The multiseptate gallbladder. A rare malformation of the biliary tract. Chirurgie Pediatrique. 1989;30(6):292-4.*
9. *Adear H, Barki Y. Multiseptate gallbladder in a child: incidental diagnosis on sonography. Pediatric Radiology. 1990; 20(3):192-192. doi: 10.1007/bf02012972.*
10. *Strauss S, Starinsky R, Alon Z. Partial multiseptate gallbladder: sonographic appearance. Journal of Ultrasound in Medicine. 1993;12(4):201-203. doi: 10.7863/jum.1993.12.4.201.*
11. *Tan CE, Howard ER, Driver M, Murray-Lyon IM. Non-communication multiseptate gall blabber and choledochal cyst: a case report and review publications. Gut. 1993;34(6):853-856. doi: 10.1136/gut.34.6.853.*
12. *Kocakoc E, Kiris A, Alkan A, Bozgeyik Z, Sen Y, Ozdemir H. Multispetate gallbladder in a child with chronic abdominal pain: ultrasonography, magnetic resonance imaging and magnetic resonance cholangiography findings. European Journal of Radiology Extra. 2003;47(1):22-25. doi: 10.1016/s1571-4675(03)00073-7.*
13. *Erdogmus B, Yazici B, Ozdere BA, Akcan Y. Clinical and Ultrasonographic Findings in Patients with Multiseptate Gallbladder. The Tohoku Journal of Experimental Medicine. 2004;204(3):215-219. doi: 10.1620/tjem.204.215.*
14. *Bahadir B, Ozdamar SO, Gun BD, Bektas S, Numanoglu KV, Kuzey GM. Ectopic Pancreas Associated with Choledochal Cyst and Multiseptate Gallbladder. Pediatric and Developmental Pathology. 2006;9(4): 312-315. doi:10.2350/10-05-0125.1.*
15. *Demirpolat G, Duygulu G, Tamsel S. Multiseptate gallbladder with recurrent abdominal pain in a child. Diagnostic and Interventional Radiology. 2008;16(4):306-7. doi:10.4261/1305-3825.dir.1926-08.0.*
16. *Geremia P, Toma P, Martinoli C, Camerini G, Derchi LE. Multiseptate gallbladder: Clinical and ultrasonographic follow-up for 12years. Journal of Pediatric Surgery. 2013;48(2):25-8. doi:10.1016/j.jpedsurg.2012.11.053.*
17. *Ortola P, Carazo ME, Cortes J, Rodriguez L. Multiseptate Gallbladder in an Asymptomatic Pediatric Patient. Journal of Gastrointestinal & Digestive System. 2015;5(6):353. doi:10.4172/2161-069x.1000353.*
18. *Mendola FL, Fatuzzo V, Similari P, et al. Multiseptate Gallbladder in a Child: A Possible Cause of Poor Growth. Journal of Pediatric and Gastroenterology and Nutrition. 2017;68(1). doi:10.1097/MPG.0000000000001664.*
19. *Sabra T, Takrouney M, Osman M, Mostafa M. Laparoscopic cholecystectomy for symptomatic multiseptate gallbladder. The Egyptian Journal of Surgery. 2017;36(4):457. doi:10.4103/ejs.ejs_82_17.*
20. *Bertozzi M, Bizzarri I, Angotti R, et al. Multiseptate Gallbladder in Child. Journal of Pediatric Case Reports. 2019; 45:101212. doi: 10.1016/j.epsc.2019.101212.*

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