CASE REPORT

Complete mesocolic malposition of the gallbladder: An unusual case report with literature's review

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ABSTRACT

Anatomic variations and congenital anomalies involving the gallbladder position, shape, and number are frequently encountered on routine abdominal imagings and at surgery. However, most have no clinical significance, but their recognition is important because they may predispose to gallbladder diseases, serve as a potential source of confusion and diagnostic pitfalls for radiologists and surgeons, and increase the risk of inadvertent injury during biliary tract surgery or intervention. We observed an intra-mesocolic gallbladder found unexpectedly during the cholecystectomy in a 65-year-old male patient who was being operated on for acute calculous cholecystitis. An abdominal ultrasonography and computed tomography scan reported no anomalous or malpositioned gallbladder pre-operatively. As the location of this organ could not be definitely clarified in his previous operation elsewhere, we performed an explorative laparotomy. There was no gallbladder at the normal position. The organ was found embedded deeply within the proximal portion of the transverse mesocolon, and then it was successfully excised. We established the diagnosis of an ectopic gallbladder in mesocolic position.

Keywords: Cholecystectomy; cholecystitis; ectopia; gallbladder; malposition; mesocolon.

INTRODUCTION

General surgeons have long been aware of the intraoperative difficulties encountered in performing laparoscopic or open cholecystectomy in patients with anomalous or malpositioned gallbladder. Positional variation of the gallbladder is a rare entity and has been reported only in case presentations. Congenital or acquired malposition of the gallbladder is a relatively less well-known cause of intraoperative difficulty and may not be detected on routine preoperative imaging. Knowledge of the wide range of anatomical, radiological, and surgical findings of malposition of the gallbladder can help in cases where the diagnosis is unclear and helps the patient to obtain the proper approach for ectopic gallbladder.[1,2]

Since cholelithiasis rates are high in this patient population, they may be prone to complications such as acute cholecystitis, empyema, gangrene, gallbladder perforation, pericholecystic abscess, and fistulation between the gallbladder and the duodenum and/or stomach.[3] Therefore, physicians should have a high index of suspicion and recommend timely surgical intervention to avoid future complications.

We herein present a case of unusual malposition of the gallbladder found unexpectedly embedded deeply within the transverse mesocolon.

CASE REPORT

This 65-year-old male patient came to emergency room suffering with right upper quadrant pain, nausea and vomiting, and subfebrile fever. His medical history included an appendectomy 6 years previously. The patient had no important family history and denied alcohol usage or smoking tobacco. Gallstones were diagnosed 4 years earlier during investigation for right upper quadrant pain, nausea, and vomiting in a

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local state hospital, and he was operated on at that hospital with a diagnosis of symptomatic cholelithiasis. The operation was started with a laparoscopic approach. Since laparoscopy showed no gallbladder in its liver bed, the surgeon decided to convert to open procedure due to uncertainty about anatomical location of the gallbladder. He was not able to find the gallbladder, and then he decided to close the abdomen and referred the patient to a hepato-biliary center for further investigation and treatment. However, the patient has not applied to any hospital for cholecystectomy during the past 4 years because of his fears about second operation.

The physical examination showed a right subcostal incision and moderate tenderness to palpation in the right upper quadrant without evidence of peritonism. His blood tests showed a normal white blood cell count and liver function tests were within the normal ranges. An abdominal ultrasound demonstrated a distended gallbladder and diffuse thickening of the gallbladder wall, 7 mm in maximal diameter, in keeping with acute cholecystitis. A cholelithiasis with two stones, the large one measuring 14 mm in diameter with posterior acoustic shadowing, was also present. Computed tomography (CT) of the abdomen showed two stones, each measuring 8 mm in diameter in the gallbladder (Fig. 1). Neither ultrasound nor CT scan reported any positional abnormality of the gallbladder.

The patient was taken to the operating theatre with a diagnosis of acute cholecystitis with cholelithiasis. An operation was performed using a right subcostal laparotomy. At exploration, the liver was firmly adhered to the ligamentum hepato-duodenale, greater omentum, transverse colon, and stomach. After separation of the adhesions with meticulous sharp dissection, we confirmed that the organ was not situated in the gallbladder fossa. We considered the gallbladder could be positioned within the transverse mesocolon upon reviewing CT scan findings repeatedly. The transverse mesocolon was incised vertically and the fundus of the gallbladder protruded anteriorly. We saw that the fundus, body, and infundibulum of the gallbladder were lying deeply between the peritoneal sheets of the transverse mesocolon (Fig. 2). Then, we successfully excised the gallbladder from the mesocolon by antegrade dissection without putting the colon and its blood supply at risk of injury during dissection (Fig. 3a and

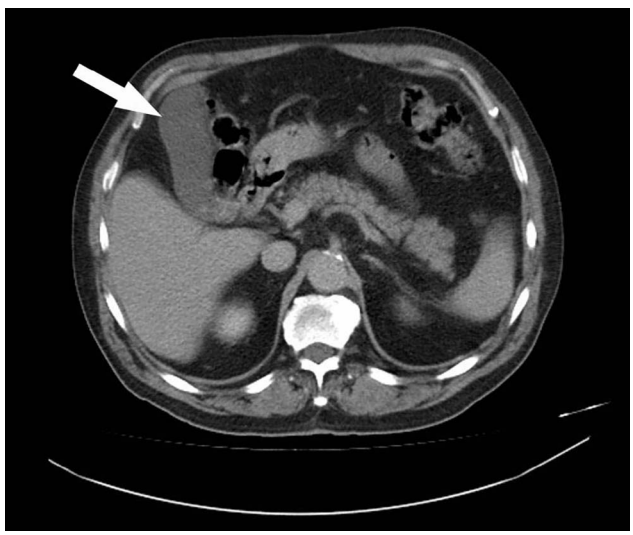

Figure 1. Axial CT image showing localization of the gallbladder (white arrow).

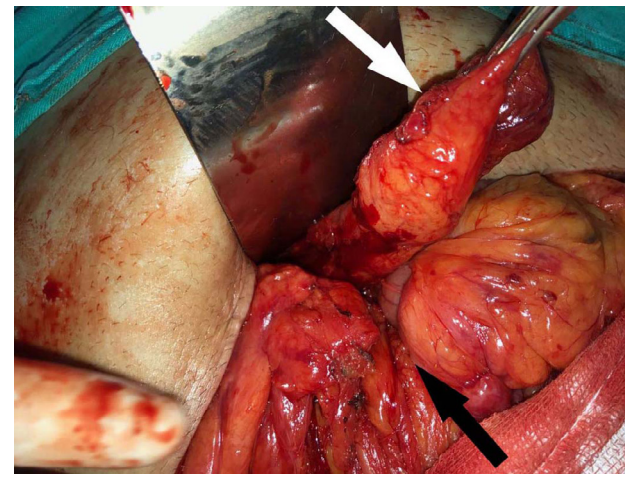

Figure 2. Intraoperative view as seen through the laparotomy demonstrating a completely dissected gallbladder (white arrow) (clamp is on the fundus of the gallbladder) and the transverse mesocolon (black arrow).

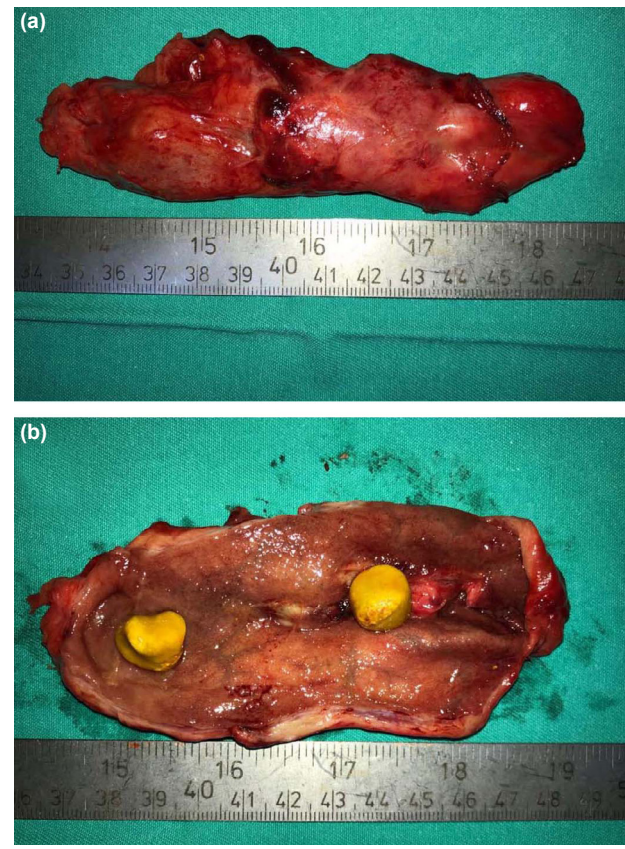

Figure 3. Gross appearance of the resected specimen **(a)**, and two large gallstones residing in the gallbladder upon opening the surgical specimen longitudinally **(b)**.

b). During the operation, we found that there was a bit long and wide cystic duct connecting to the common bile duct on the right side, and the cystic artery arising normally from the right hepatic artery. First, the cystic artery was ligated and divided. Second, the cystic duct was divided, and then an intraoperative cholangiogram was performed via the cystic duct stump. The intrahepatic and extrahepatic biliary trees were visualized and showed no abnormality. After that, the cystic duct stump was ligated. The patient made an uneventful recovery after the procedure and was sent to home on postoperative day 3. Histology of the gallbladder confirmed chronic cholecystitis and cholelithiasis with no evidence of malignancy. Written informed consent for publication of the patient's clinical details and images was obtained from the patient.

Table 1. Congenital and developmental abnormalities of the gallbladder[4–6]

Formation / Shape	Number	Position
Phrygian cap	Agenesis	Floating
Bilobed	Hypoplasia	Intrahepatic
Hourglass	Duplication	Antehepatic
Septate	Triplication	Suprahepatic
Rudimentary		Retrohepatic
Tortuous		Transverse
S-shaped		Intrathoracic
Multiseptated		Retrorenal
Multilocular cysts		Retroduodenal
Cystic malformations		Retrodisplaced
Congenital diverticula		Extra-abdominal
		Left-sided gallbladder
		Abdominal wall location
		Lesser omentum location
		Falciform ligament location

DISCUSSION

We observed an intra-mesocolic gallbladder found unexpectedly during the cholecystectomy performed under the emergency conditions in a 65-year-old male patient who was being operated on for acute calculous cholecystitis. An abdominal ultrasonography and CT scan reported no anomalous or malpositioned gallbladder preoperatively. As the location of this organ could not be definitely clarified in his previous operation elsewhere, we performed an explorative laparotomy. There was no gallbladder at the normal position. The organ was found embedded deeply within the proximal portion of the transverse mesocolon, and then it was completely excised. We established the diagnosis of an ectopic gallbladder in mesocolic position.

The development of the liver and biliary ducts begins at the 4th week in the embryo as a protrusion on the ventral wall of the primitive midgut. The cranial bud (pars hepatica) turns into two lobes of the liver, whereas the caudal bud (pars cystica) develops into the gallbladder and extrahepatic biliary tract at the 3-mm stage. The primitive gallbladder and common bile duct have appeared at the 5-mm stage. The liver and hepatic ducts have formed, and the gallbladder and the cystic duct have emerged from the common duct at the 7-mm stage. A completely open lumen has formed in the gallbladder and the extrahepatic ducts by the 12-mm stage. The liver starts to secrete bile that flows through the extrahepatic biliary tract into the duodenum by the 12th week of fetal life.[4] Any disruption of or divergence from this formational process may cause malformation of the gallbladder or the biliary ducts.[5]

Gallbladder anomalies can be associated with their configuration, number, and location (Table 1). Agenesis, duplication, ectopia, hypoplasia, septation, and cysts are the most common.[4–6] Gallbladder malpositions can be either congenital or acquired. Congenital malposition without situs inversus is an unusual anomaly of the biliary tract. It can be categorized anatomically into left-sided, intrahepatic, transverse,

Table 2. Clinical features of 3 cases with mesocolic gallbladder

Case	Age/ Sex	Clinical presentation	Preoperative radiological method	Preoperative correct diagnosis	Gallbladder localization	Type of surgery	Biliary/ Vascular anomaly	Intraoperative cholangiogram	Postoperative outcome
1[8]	43/M	Biliary colic	US	No	Transverse mesocolon	Conversion cholecystectomy	No	Not done	Cure
2[9]	44/F	Biliary colic	US	No	Transverse mesocolon	Laparoscopic cholecystectomy	No	Normal	Cure
3	65/M	Acute calculous cholecystitis	US+CT	No	Transverse mesocolon	Open cholecystectomy	No	Normal	Cure (Current case)

US: Ultrasonography; CT: Computed tomography.

and retrodisplaced.[7] Acquired malposition is very often due to cirrhosis. Further malpositions can be listed as follows: intrathoracic, retroduodenal, lesser omentum, falciform ligament, and abdominal wall, etc. Nevertheless, there is no scientifically based explanation as to how these variations arise.[5,8] One possible consideration would be a poorly attached gallbladder that remained mobile intraabdominally when the intestinal contents returned to the abdominal cavity and the umbilical ring closed. Saygun et al.[8] reported an intra-mesocolic malposition of the gallbladder. They noted the gallbladder under the direct vision resting in the transverse mesocolon during laparoscopic cholecyctectomy (LC) and then converted the procedure to open laparatomy to verify the situation. Solis et al.[9] published a case of a mesocolic embedded gallbladder. They could not see a gallbladder at the gallbladder fossa during LC. Surgery was abandoned and an abdominal CT scan was organized which demonstrated a gallbladder adjacent to the ascending colon/hepatic flexure. Completion of LC was performed on the same day confirming the gallbladder was peritoneolized in transverse mesocolon. Our patient's gallbladder could not be found in his first operation elsewhere, and we also could not see the gallbladder in its liver bed because of its deeply embedded location within the transverse mesocolon. We offer to name our patient's gallbladder anomaly as a "mesocolic gallbladder." The mesocolic gallbladder is the one that its entire circumference is surrounded by fatty areolar tissue of mesocolon. To the best of our knowlege, this is the third reported case of mesocolic gallbladder that has been described in the English literature so far (Table 2).

Gallbladder anomalies often represent pitfalls in surgery. Therefore, knowledge of the wide range of abnormalities in position, shape, and number of the gallbladder is important to prevent misdiagnosis. Moreover, to minimize the risk of iatrogenic injury to the bile ducts, a cholangiogram of the relevant structures could be considered. Therefore, we performed an intraoperative cholangiography via cyctic duct stump to visualize the biliary tract and saw a normal biliary system. Malpositioned gallbladders do not completely empty, leading to impaired function, contributing to stasis and cholelithiasis.[10] Cholelithiasis rates are as high as 60% in patients with gallbladder anomaly, probably due to bile stasis.[11] Patients with malpositioned gallbladders, therefore, are susceptible to cholecystitis and other complications of cholelithiasis.[12] Ectopic gallbladders should be excised even if they are asymptomatic to avoid problems in the diagnosis of future gallbladder diseases.[13] The possibility of an ectopic gallbladder must be kept in mind when a suspicious cystic area is encountered in an atypical location and when the gallbladder is not seen in its normal location or if the preoperative diagnostic workup does not confirm the typical clinical symptoms of gallbladder disease.[5,14] Although preoperative diagnosis of a gallbladder anomaly is usually possible with detailed imaging in the case of major surgeries, suspicious findings for this developmental abnormality may not be detected easily by emergency ultrasound or CT scan, as in our case. Ultimately, the diagnosis was made at surgery in this case.

This extremely rare case shows a very unusual finding that has previously not been reported; the development of acute cholecystitis of the ectopic mesocolic gallbladder. This was the reason our patient came to medical attention and subsequently underwent surgical exploration. It is not possible to attribute causality to the development of acute cholecystitis with the ectopic location of the gallbladder, however, it is interesting that our patient had acute cholecystitis with gallstones. Furthermore, although our patient's gallbladder was displaced, he experienced right upper quadrant pain, nausea, and vomiting similar to patients without gallbladder displacement. This is likely due to the preservation of the normal splanchnic innervation of the gallbladder despite the abnormal location.[15] Fortunately for this patient, the gallbladder was removed prior to the development of a complication such as gangrene or perforation that could have resulted in retroperitoneal empyema or abscess and would have complicated the situation further.

Conclusion

We observed an intra-mesocolic gallbladder found unexpectedly during the cholecystectomy. Therefore, we offer to name this anomaly as "mesocolic gallbladder." Displacement of the gallbladder and distortion of biliary anatomy are not widely appreciated and may not be detected by current routine preoperative imaging modalities such as ultrasonography or CT scan. In instances of diagnostic uncertainty, there should be consideration for more definitive imaging such as magnetic resonance cholangiopancreatography in the preoperative period. Acute cholecystitis with cholelithiasis of malpositioned gallbladder represents an extremely rare complication of gallbladder disease, which requires a rapid treatment in order to reduce pathology-related morbidity and mortality. Considering the progress of interventional radiology, a percutaneous drainage and antibiotherapy could well treat the empyema or abscess followed by a distant cholecystectomy for patients who are initially poor surgical candidates because of their comorbidities. The presence of anomalous or malpositioned gallbladder may cause a surgical challange during the cholecyctectomy performed in the emergency setting. When performing LC in patients with gallbladder anomaly, the operating surgeon must be aware of the potential for anatomical variation and have a flexible surgical approach, such as the use of extra ports and modification of traditional port positions. During surgical operations such as laparoscopic or open cholecystectomy, knowledge of mesocolic gallbladder helps to surgeon to prevent iatrogenic injuries, particularly to the extrahepatic biliary tract. As a very rare anomaly of the biliary system, when the surgeon encounters an empty gallbladder bed during cholecystectomy, it should be borne in mind because of its close proximity with transverse mesocolon.

Informed Consent: Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

Peer-review: Internally peer-reviewed.

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REFERENCES

1. Buschulte J, Brands W, Wirth H. Atopic gallbladder. Case report, embryologic etiology and review of the literature. Langenbecks Arch Chir 1992;377:53–5. [CrossRef]
2. Naganuma S, Ishida H, Konno K, Hamashima Y, Hoshino T, Naganuma H, et al. Sonographic findings of anomalous position of the gallbladder. Abdom Imaging 1998;23:67–72. [CrossRef]
3. Ali MF, Friedel D, Levin G. Two anomalies in one: A rare case of an intrahepatic gallbladder with a cholecystogastric fistula. Case Rep Gastroenterol 2017;11:148–54. [CrossRef]
4. Pitt HA, Gadacz TR. Biliary tract: Anatomy, embryology, anomalies, and physiology. In: Matthews JB, Pemberton JH, editors. Shackelford's Surgery of the Alimentary Tract. 7th ed. Philadelphia, PA: Elsevier, Saunders; 2013. p. 1286–302. [CrossRef]
5. Rabinovitch J, Rabinovitch P, Rosenblatt P, Pines B. Congenital anomalies of the gallbladder. Ann Surg 1958;148:161–8. [CrossRef]
6. Quigley BC, Adsay NV. Diseases of the gallbladder. In: Burt AD, Ferrell L, Hübscher SG, editors. MacSween's Pathology of the Liver. 7th ed. Philadelphia, PA: Amsterdam, Netherlands: Elsevier; 2017. p. 594–635.
7. Gross RE. Congenital anomalies of the gallbladder. Arch Surg 1936;32:131–62. [CrossRef]
8. Saygun O, Aydinuraz K, Daphan C, Akkus A, Agalar F. Case report: Intramesocolic malposition of the gallbladder. Turk J Med Sci 2004;34:281–2.
9. Solis E, Ling A, Yuen L. Ectopic gallbladder: An unusual case of a mesocolic embedded gallbladder. ANZ J Surg 2020;90:1507–9. [CrossRef]
10. Agarwal S, Lal BB, Rawat D, Rastogi A, Bharathy KG, Alam S. Progressive familial ıntrahepatic cholestasis (PFIC) in Indian children: Clinical spectrum and outcome. J Clin Exp Hepatol 2016;6:203–8. [CrossRef]
11. McNamee EP. Intrahepatic gallbladder. Am J Roentgenol Radium Ther 1935;33:603–10.
12. Lobo SW, Menezes RG, Mamata S, Baral P, Kanchan T, Hunnargi SA, et al. Ectopic partial intrahepatic gall bladder with cholelithiasis-a rare anomaly. Nepal Med Coll J 2007;9:286–8.
13. Tzardinoglou E, Prousalidis J, Apostolidis S, Katsohis C, Aletras H. Hanging noncalculous gallbladder. HPB Surg 1996;9:137–9. [CrossRef]
14. Pradeep VM, Ramachandran K, Sasidharan K. Anomalous position of the gallbladder: Ultrasonographic and scintigraphic demonstration in four cases. J Clin Ultrasound 1992;20:593–7. [CrossRef]
15. Deb SJ. Massive right-sided bochdalek hernia with two unusual findings: A case report. J Med Case Rep 2011;5:519. [CrossRef]

OLGU SUNUMU - *ÖZ*

Komple mezokolon içine gömülü safra kesesi yerleşim yeri anomalisi: Nadir bir olgu sunumu ve literatürün gözden geçirilmesi

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Safra kesesinin yerleşim yeri, şekil ve sayısına dair anatomik varyasyonlarına ve doğumsal anomalilerine rutin görüntüleme yöntemleri ve cerrahi sırasında sıklıkla rastlanmaktadır. Pek çoğunun klinik bir önemi bulunmamasına karşın bilinmeleri önem taşımaktadır. Çünkü bunlar safra kesesi hastalıklarına yatkınlık oluşturabilirler, radyologlar ve cerrahlar için kafa karışıklığı ve tanısal hatalar için muhtemel bir zemin yaratabilirler ve safra yolları cerrahisi veya girişimleri sırasında istenmeyen yaralanma riskini artırabilirler. Biz 65 yaşında erkek bir hastada akut taşlı kolesistit tanısıyla kolesistektomi yapıldığı sırada beklenmedik bir biçimde mezokolon içine gömülü bir safra kesesiyle karşılaştık. Ameliyat öncesi dönemde çekilen karın ultrasonografisi ve bilgisayarlı tomografide safra kesesi yerleşim yeri anomalisi rapor edilmemişti. Hastanın daha önceden başka hastanede geçirdiği ameliyatta, safra kesesinin yeri tam olarak belirlenemediği için biz de eksploratif laparatomi yapmaya karar verdik. Operasyonda safra kesesinin normal yerinde olmadığı görüldü. Safra kesesinin transvers mezokolonun proksimal bölümü içinde derinde gömülü olduğu tespit edildi ve safra kesesi başarılı bir şekilde eksize edildi. Biz de böylelikle mezokolik pozisyonda ektopik safra kesesi tanısını koymuş olduk.

Anahtar sözcükler: Ektopi; kolesistektomi, kolesistit, malpozisyon, mezokolon; safra kesesi.

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