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# A Rare Case of a Left-sided Gallbladder Accompanied with an Aplastic Cystic Duct in a Patient with Acute Cholecystitis

## Authors' Contribution:

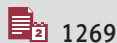
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**Corresponding Author:** Dimitrios Chatzifotiou, e-mail: [dimitrakis2811@outlook.com.gr](mailto:dimitrakis2811@outlook.com.gr)**Conflict of interest:** None declared

**Patient:** Female, 64-year-old  
**Final Diagnosis:** Akute cholecystitis with left-sided gallbladder  
**Symptoms:** Upper abdominal pain  
**Medication:** —  
**Clinical Procedure:** Laparoscopic cholecystectomy  
**Specialty:** Surgery

**Objective:** Congenital defects/diseases**Background:** A left-sided gallbladder without situs inversus is a rare congenital anomaly of the gallbladder with a prevalence ranging from 0.04–0.3%.**Case Report:** We present a case of a female patient, referred to our clinic with clinical features of an acute cholecystitis. After performing the standard preoperative investigations, which confirmed the diagnosis, the patient underwent a laparoscopic cholecystectomy. We found a left-sided gallbladder, attached to the lower surface of the left lobe of the liver. During the dissection in the Callot triangle an aplastic cystic duct was also identified. The extirpation of the gallbladder was performed antegrade, allowing a better exposition of the critical structures.**Conclusions:** A left sided gallbladder is almost an incidental finding, which can be accompanied with further anomalies of the biliary tree. A combination of these 2 variations is very rare without any other reported cases in the literature.**MeSH Keywords:** Cholecystectomy, Laparoscopic • Cholecystitis, Acute • Cystic Duct • Gallbladder**Full-text PDF:** <https://www.amjcaserep.com/abstract/index/idArt/920821>

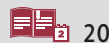
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## Background

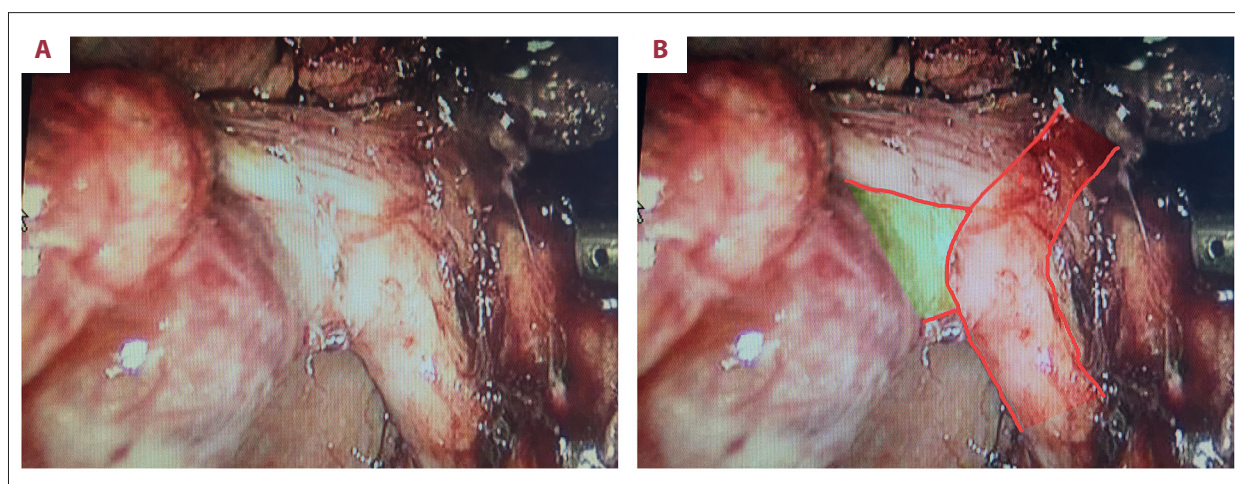
A left-sided gallbladder without situs inversus, located between liver segments III and IV, left to the vena hepatica media is a rare anatomical variation, which can be accompanied with further anomalies of the biliary tree and the portal vein [1,2]. A co-existence of a left-sided gallbladder with an aplastic cystic duct has not been reported in the literature so far. Thus, we report a case of a female patient with an acute cholecystitis, which was treated with a laparoscopic cholecystectomy. The combination of aforementioned co-existent condition was intraoperatively identified.

## Case Report

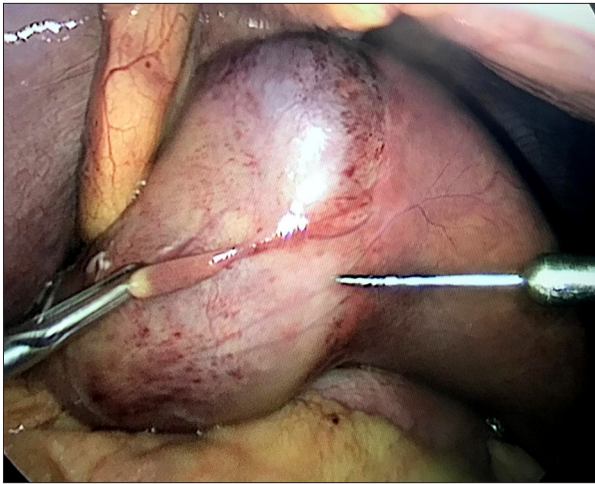
A 64-year-old female was referred to our emergency unit with a history of epigastric pain lasting 4 hours. Clinical examination revealed a tenderness in the right upper quadrant and epigastrium with a positive Murphy's sign, without jaundice. The blood test showed elevated white blood cell counts (14.3/ $\mu$ L) with a CRP- elevation (24.18 mg/dL) and normal levels of liver enzymes (SGOT 27 U/L, SGPT 57 U/L, bilirubin 0.5 mg/dL, alkaline phosphatase 83 U/mL). Her past medical history was unremarkable. The ultrasound examination showed a 5 mm gallbladder wall thickening with presence of multiple stones. Because of the profound pain, the obesity of the patient, and the luminal intestinal gas which limited the sonographic assessment of the other upper abdominal organs, we performed a computed tomography (CT) scan to exclude a secondary wall thickening of the gallbladder to sealed duodenal ulcer perforation or right sided diverticulitis [3,4]. The findings confirmed the diagnosis of acute cholecystitis. The patient was admitted to our department to undergo a laparoscopic cholecystectomy on the same day.

At laparoscopy, the gallbladder was located on the left side of the falciform ligament, between liver segments III and IV, without any signs of a situs inversus (Figure 1). We started the operation using 4 ports, 2 of 10 mm and 2 of 5 mm. The gallbladder was tense and distended, making it difficult to grasp. That problem was managed by aspirating the content of the gallbladder with a needle using the 10 mm epigastric trocar. In order to attain a better exposition of the Callot triangle, we inserted an additional 10 mm trocar on the left side of the middle line between the subxiphoidal and umbilical trocar. The visceral peritoneum was highly incised on the gallbladder and a structure similar to the cystic duct was identified. A junction of the gallbladder and the tubular structure was identified. Posterior to this structure another bile duct with the same diameter was found. Because of the unusual anatomic findings and to attain a better exposition we performed the gallbladder extirpation in an antegrade way. The gallbladder was separated from the hepatic bed. Behind the Hartmann pouch, the junction between cystic artery and gallbladder was found. The area between the cystic artery and the Hartmann pouch was dissected, creating a window through which the liver was visible. The cystic artery was clipped and divided. Finally, at the end of the exploration we recognized that the 2 initially identified bile ducts were a part of a loop-shaped common bile duct and the gallbladder was drained direct into it, as a sign of absent cystic duct (Figure 1). In order to avert an injury to the common bile duct, we transected the Hartmann pouch 5 mm distal to its junction into the gallbladder with an endoscopic linear stapler 55 mm (blue cartridge). Because of the clear view of the Callot triangle structures, we did not perform a cholangiogram.

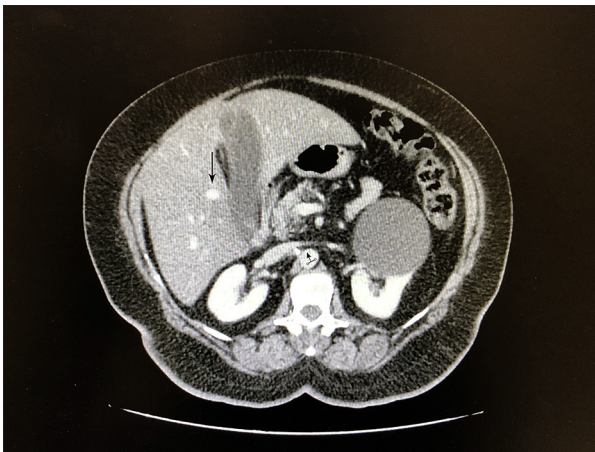
The pathological report revealed an acute gangrenous cholecystitis with an impacted stone in the Hartmann pouch. The post-operative period was uneventful, and the patient was discharged 2 days later.



**Figure 1.** (A, B) The dilated Hartmann Pouch is marked with green color and the course of common bile duct with red color.



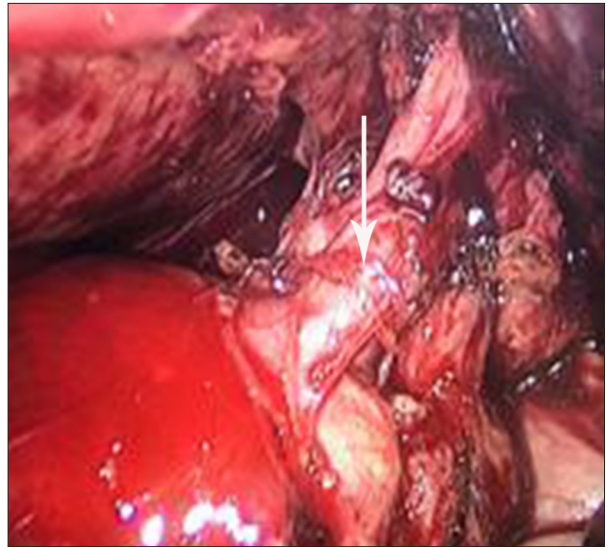
**Figure 2.** The position of the gallbladder before the puncture to the left of ligamentum teres hepatis.



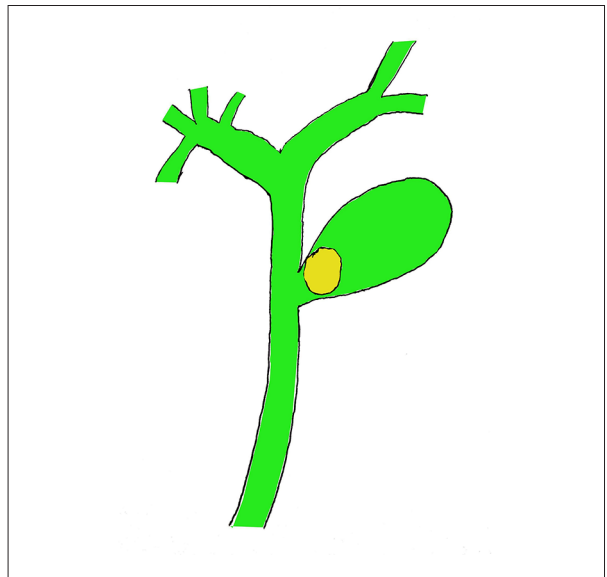
**Figure 3.** The position of the left-sided gallbladder to the left of vena hepatica media.

## Discussion

Congenital anomalies of the gallbladder are rare. The incidence, according to a study performed on fetal examinations, was 0.15% [5]. A left-sided gallbladder was detected only in 6 cases out of 10 016 examinations. The reported prevalence in the literature ranges between 0.04% and 0.3%, with more than 100 cases [6–14]. The left-sided gallbladder must be located to the left of the falciform ligament, beneath the left lobe of the liver and between segments III and IV or on segment III [1]. The cystic artery should always cross in front of the common bile duct from right to left [15]. Additionally, the vena hepatica media must clearly run to the right of the gallbladder. These features differentiate a true left-sided gallbladder from the gallbladder located to the left of a right-sided round ligament. Figure 2 presents the position of the gallbladder to the right of the round ligament, Figure 3 presents the position to the right of the vena hepatica media, and Figure 4 presents



**Figure 4.** The cystic artery crosses in front of common bile duct from right to left.



**Figure 5.** Hand-made schema of the impaction of the gallstone in the dilated Hartmann Pouch.

the course of the cystic artery crossing from right to the left. A retrospective assessment of the computerized tomography scans with the radiologists in our clinic did not reveal any other anomalies of the intrahepatic vascular or biliary tree. The second anatomical anomaly that was found in this case was the aplastic cystic duct, which can be either congenital or acquired. A congenitally absent cystic duct is a rare variety with only 11 cases found in the literature [16]. The cause of an acquired absence of the cystic duct is a severe fibrosis or an impacted gallstone in the cystic duct (Figure 5). We considered that in this case, the patient had a previous short bile duct (<5 mm), which became secondarily aplastic after the impaction of the

gallstone [17]. The normal common bile duct diameter and the normal levels of the liver enzymes preoperative allowed for a differentiation between the acquired aplastic cystic duct and a type I Mirizzi syndrome, caused by stones impacted in the infundibulum with compression of the common bile duct [18]. The histological examination in our case showed an impacted gallstone in the Hartmann pouch, indicating that the anomaly was acquired.

The common preoperative ultrasonography could not detect the left-sided gallbladder. We performed a CT scan to confirm the diagnosis of an acute cholecystitis, rather than detecting an anatomical anomaly. According to the CT scan the gallbladder was localized beneath the left lobe of the liver. The presence of the Vena hepatica media on the right side of the gallbladder was retrospective confirmed with the CT scan.

To avert operative complications, the dissection in the Callot triangle must be performed carefully. Before clipping all the structures of the Callot triangle, their junction with the gallbladder must be clearly identified (Strasberg's critical view of safety) [19]. A transection of the common bile duct by misidentifying it as a cystic duct with an excessive loss of the continuity of the common bile duct leads compulsorily to a biliodigestive anastomosis [20]. In order to attain an adequate visualization, an antegrade gallbladder separation from the

hepatic bed can be performed. In case of doubt, an intraoperative cholangiogram can be carried out to confirm the ductal anatomy. The use of an additional trocar or a modification of the typical entry site, as performed in this case, can also be considered.

In the presence of an aplastic cystic duct with a wide Hartmann pouch, an endoscopic linear stapler can be used to divide the Hartmann pouch, averting a constriction of the common bile duct.

## Conclusions

A left-sided gallbladder in combination with an acquired aplastic cystic duct is an exceptional anatomical variety, which cannot be easily identified by the common preoperative ultrasonography. The exposure of the structures of Callot triangle and especially of the cystic duct and cystic artery with their junction to gallbladder is mandatory. If the anatomy remains unclear, the antegrade separation from the liver bed or the intraoperative cholangiogram can provide valuable further information.

## Conflict of interest

None.

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