# ACUTE ACALCULOUS CHOLECYSTITIS WITH GALLBLADDER PERFORATION IN CHILDREN – CASE REPORT

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**ABSTRACT**

Although relatively common in adult pathology, acute acalculous cholecystitis with gallbladder perforation is a rather infrequent entity in pediatric practice. In many cases, its unspecific clinical symptoms and the often inconclusive medical imagining results lead to the diagnosis of acute acalculous cholecystitis being set intraoperatively. Nevertheless, this condition should be considered when setting the differential diagnosis of a peritonitis syndrome in children.

**Key words:** acute acalculous cholecystitis, peritonitis

## INTRODUCTION

Spontaneous gallbladder perforation is extremely rare in pediatric practice, as it is an exclusive complication of acute cholecystitis or of gallbladder inflammation, accompanied or not by gallstones spillage. Notwithstanding the above, gallbladder perforation should be considered when setting the differential diagnosis of an acute abdomen. The gallbladder perforation diagnosis is extremely hard to set, as its clinical examination, biological specimens and imaging explorations are unspecific. This usually delays the diagnosis, which is most of the times set intraoperatively.

### Case report

Here is the case of a 2-year-old male patient, with no significant pathological history, who comes to the authors' clinic complaining of altered general state, anorexia, abdominal pains and constipation (intestinal transit present only for gases, and no stool for 5 days). The onset of the condition dates about 14 days back, when due to several episodes of fever the patient was diagnosed with bilateral presuppurative otitis media. The patient underwent intravenous antibiotic therapy (cephalosporin), further to which his ENT condition improved. While recovering from his otitis, about 7 days after the disease onset, the patient complained of abdominal pain, vomiting and diarrheic stools (which were initially aqueous but later became semi-consistent). We decided to hospitalize the child, to start his symptomatic therapy and to attempt the restoration of his fluid and electrolytic balance. His intravenous antibiotic therapy was continued and 48 hours later his diarrheic stools disappeared. However, the patient's general state was still altered, as he refused to eat, abdominal meteorism and constipation set in. The abdominal ultrasound scan performed at the beginning of the diarrheic episode reveals a

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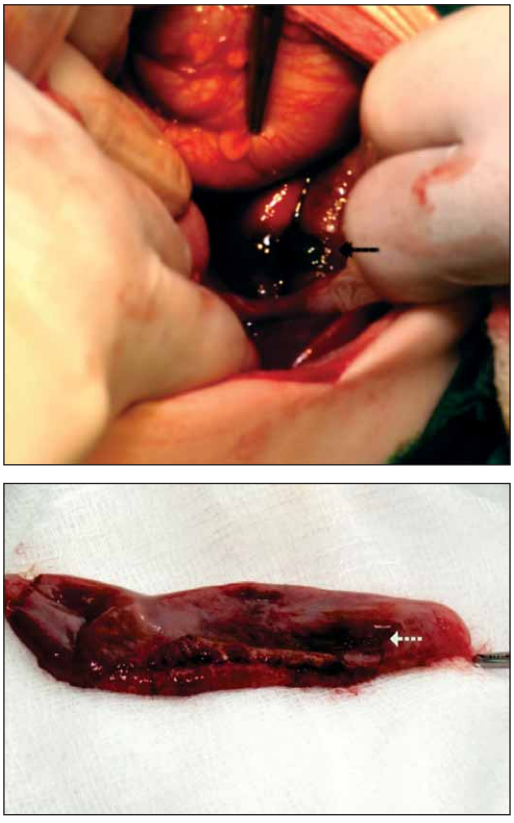
much relaxed, dysmorphic and acalculous gallbladder and no fluid in the peritoneal cavity.

The clinical examination conducted when the patient came to the surgical department revealed his altered overall health status, abdominal meteorism, very painful abdomen both at rest and on palpation, whereas the digital rectal examination performed revealed an empty rectal ampulla and no traces of feces. The biological specimens revealed no significant changes, except a slight neutrophilia.

We suspected a peritonitis syndrome and therefore recommended a thoracic-abdominal X-ray, which revealed no pathological changes, as well as an abdominal ultrasound scan, which revealed a homogeneous echostructure of the liver, a very distended folded acalculous gallbladder and downward biliary sludge. The ultrasonography also identified some fluid in the peritoneal cavity, including around the gallbladder. Since we still suspected peritonitis, possibly of appendiceal etiology, we decided to transfer the patient to the pediatric surgery department.

The surgical procedure was performed under general anesthesia and consisted of a medial laparotomic approach. In his peritoneal cavity we identified a significant amount of what seemed to be biliary fluid, an inflamed gallbladder, a considerable wall edema, as well as a perforated area located close to the gallbladder fundus (Fig. 1). The appendix had a normal appearance. Given the current condition of the patient, who was diagnosed with biliary peritonitis due to acute acalculous cholecystitis with gallbladder perforation, we decided to perform the necessary cholecystectomy, accompanied by the thorough irrigation of the peritoneal cavity, as well as the insertion of a subhepatic drain tube.



A

B

***FIGURE 1.*** *Gallbladder perforation – (A) intraoperative appearance (black arrow) and (B) excised specimen (white arrow)*

We applied an absorbable fibrin sealant patch designed to achieve hemostasis and to protect the remaining gallbladder or hepatic bed (Fig. 2). The patient´s postoperative evolution was positive, the drain tube could be removed 72 hours after the surgery and the patient was discharged 6 days after the surgery.

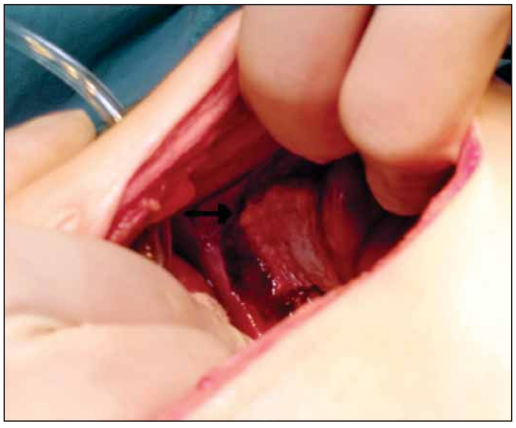


***FIGURE 2.*** *Hepatic gallbladder bed with absorbable fibrin sealant patch – intraoperative appearance*

The pathology findings of the excised specimen enabled us to set the diagnosis of acute phlegmonous cholecystitis, as the microscopic examination revealed an inflamed gallbladder wall with stasis and hemoragea and large area of mucosa ulcerations. We also found, in one specimen, an area of transparietal perforation, covered by a layer of necrotico-leukocytic detritus (Fig. 3, Fig. 4).

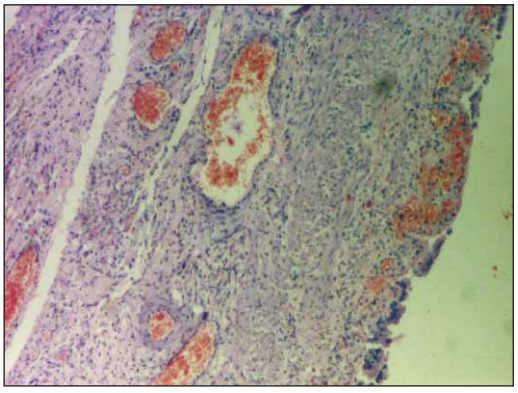


***FIGURE 3.*** *Phlegmonous cholecystitis – stasis and hemoragea*

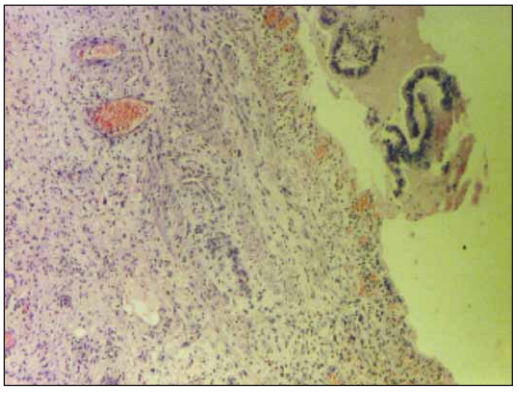


***FIGURE 4.*** *Phlegmonous cholecystitis – border of the perforation*

The child was subsequently followed up for 18 months, during which time he was on a specific diet. The patient is now completely asymptomatic.

## DISCUSSIONS

Acquired gallbladder conditions are much more infrequent in children than in adults, as for every 1,000 cases of cholecystitis in adults reported in literature there are only 1.3 such cases in children. Acute acalculous cholecystitis makes up about 5-10% of acute cholecystitis in adults, and it is even less common in pediatric pathology. About 30-50% of acute cholecystitis cases in children, defined by gallbladder wall inflammation, are acalculous, as compared to 2-17% in adult pathology (1). At the same time, gallbladder perforation is almost exclusively a complication of acute cholecystitis, with or without gallstones spillage.

According to literature data, gallbladder wall inflammation may evolve to ischemia, necrosis and then perforation (2) in 2-11% of the cases of acute cholecystitis. The perforation is located mostly in the gallbladder fundus, as this is a poorly vascularized area.

In 1934, Niemeier (3) classified cholecystitis with gallbladder perforation in three categories:

- Type 1 or acute – acute perforation with generalized biliary peritonitis;
- Type 2 or subacute – pericholecystic abscess;
- Type 3 or chronic – cholecystoenteric fistula.

Just like most of the cases reported in literature, the case described above belongs to the first type of gallbladder perforation.

The causes of acute acalculous cholecystitis include: sepsis, severe burns, injuries, different types of infections (pneumonia, giardiasis, otitis, malaria, etc) (4), yet there have been reported cases of apparently perfectly healthy children who suffered from this condition (5). The most common germs involved in acute acalculous pediatric cholecystitis etiology are: streptococci (groups A and B), gram-negative germs (especially Salmonella), hepatitis A virus, Ebstein Barr virus and different parasites (6). In the case of our patient, we consider gallbladder inflammation secondary to and associated with the fit of acute enterocolitis. No germ was identified in the peritoneal fluid cultures.

The gallbladder perforation symptoms are extremely unspecific especially in babies and include abdominal pain, meteorism, vomiting, which are characteristic of any peritonitis syndrome in children and which were also reveled in our patient.

As concerns medical imaging diagnosis, it relies especially on ultrasound scanning, although there is no clearly set criterion in literature to define acute alcalculous cholecystitis by ultrasonographic means. Thus, the diagnosis is positive in case of: gallbladder wall thickness exceeding 3 mm, globular gallbladder distension, fluid present around the gallbladder, striated gallbladder wall and sludge in the gallbladder, although none of these signs proved pathognomonic (7,8). Nevertheless, the association of 2 or more of these signs is highly suggestive of a diagnosis of acute cholecystitis. In the case of our patient, we identified retrospectively the presence of three signs: fluid around the gallbladder, distended gallbladder and sludge in the gallbladder. However, this diagnosis was not considered before the surgery.

## CONCLUSIONS

Although rare, acute acalculous cholecystitis with gallbladder perforation is an entity that should be considered when dealing with a patient with acute surgical abdomen. The association between a peritonitis syndrome with gallbladder distension and fluid present around the gallbladder revealed by ultrasonographic means are highly suggestive of this diagnosis. Early diagnosis and surgical procedure are important for a positive evolution of these cases.

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