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IMAGE OF THE MONTH

담낭 파열에 의한 간농양

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Intrahepatic Abscess due to Gallbladder Perforation

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Case: A 69-year-old male patient presented with right upper quadrant pain for 10 days. He was febrile (39℃), but the other vital signs were normal. A physical examination revealed mild tenderness on the right upper quadrant, and no rebound tenderness. The laboratory results revealed the following: a white blood cell count 244,000/mm^3 (neutrophil 88.1%), AST 188 U/L, ALT 245 U/L, ALP 78 U/L, GGT 26 U/L, and total bilirubin 8.32 mg/dL. A CT scan revealed acute calculous cholecystitis accompanied by focal perforation along the gallbladder bed of segment V and a 6×3.8 cm sized abscess

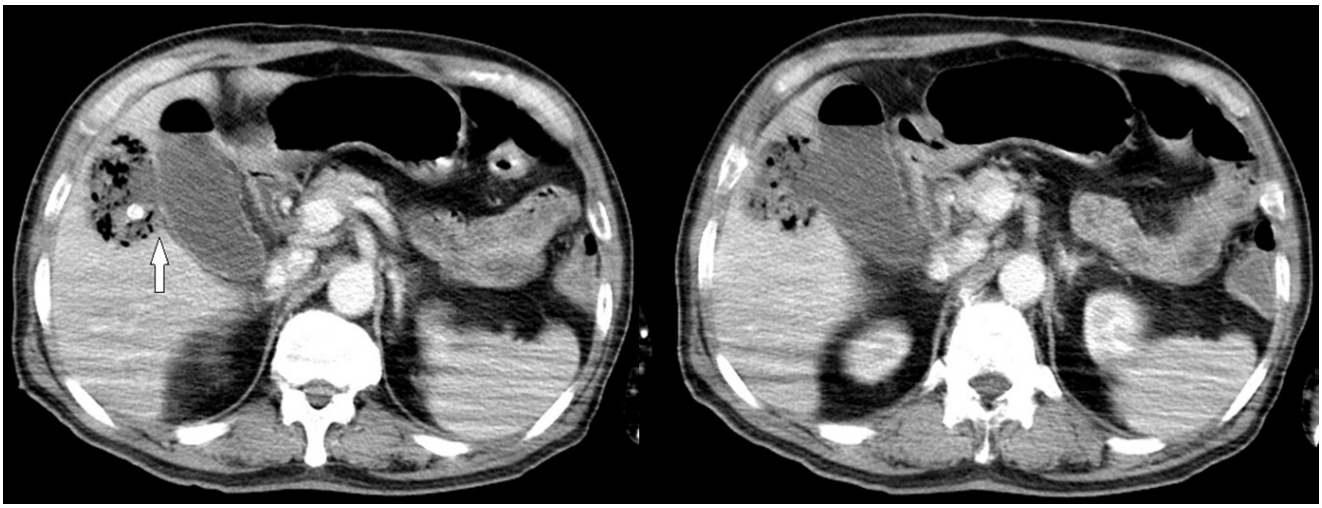

Fig. 1. Initial computed tomography scan showed acute calculous cholecystitis accompanied by focal perforation (arrow) and a 6×3.8 cm sized liver abscess and gallstone outside gallbladder.

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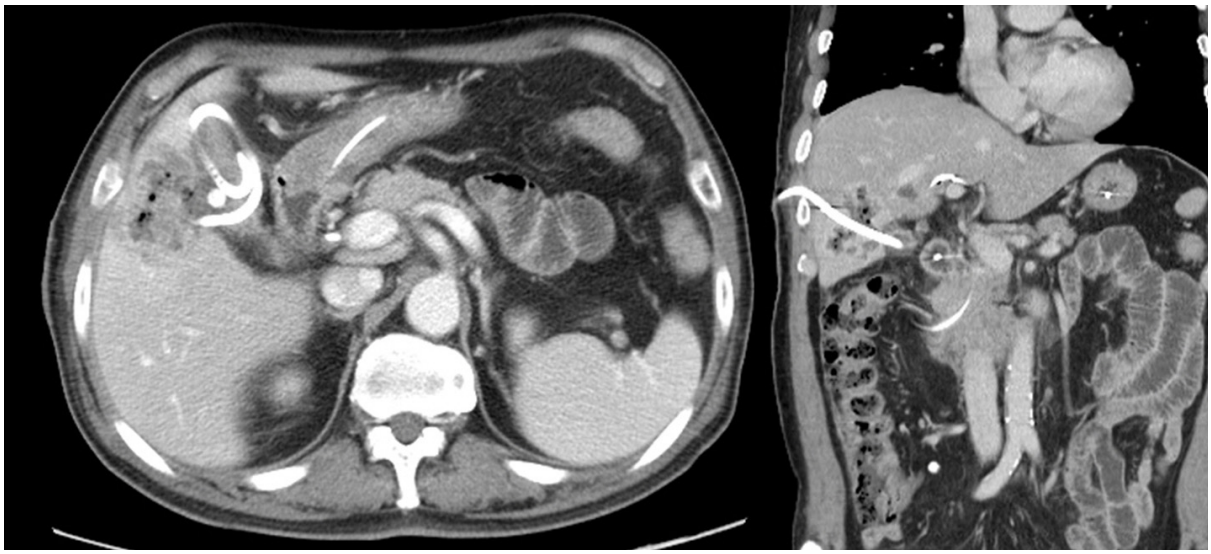

Fig. 2. Percutaneous drainage catheter was inserted into the gallbladder.

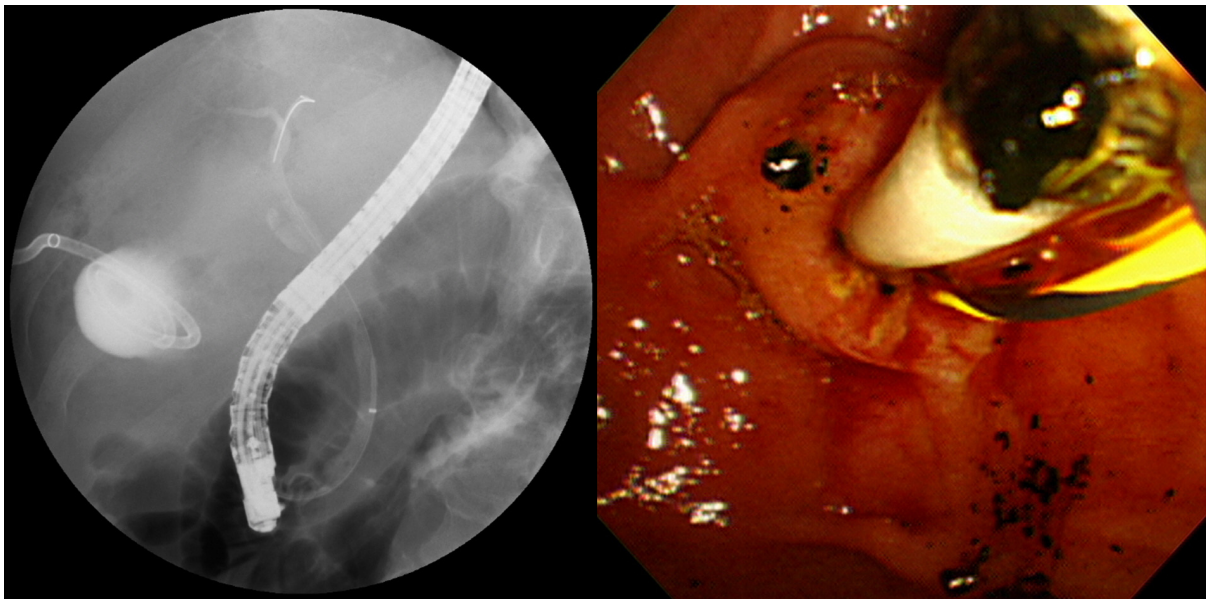

Fig. 3. Endoscopic retrograde cholangiopancreatography presented a filling defect in common bile duct, which was removed by balloon sweeping.

(Fig. 1). Percutaneous drainage into the gallbladder was performed and cefotaxime and metronidazole were administered (Fig. 2). ERCP was conducted and a large amount of sludge was extracted from the common bile duct using a balloon (Fig. 3). *Enterococcus faecalis* and *Staphylococcus aureus* were cultured in pus. The laparoscopic cholecystectomy and drainage of the hepatic abscess were performed eight days after admission (Fig. 4). The post-operative course was uneventful and the patient was discharged 14 days after surgery. The follow-up CT scan revealed a decrease in the size of the hepatic abscess.

Diagnosis: intrahepatic abscess due to gallbladder perforation

Gallbladder perforation is a rare but very serious complication. The frequency of this complication in patients with acute cholecystitis has decreased over time; the incidence was reported to be 2.9-15.4% before the 1990s, but

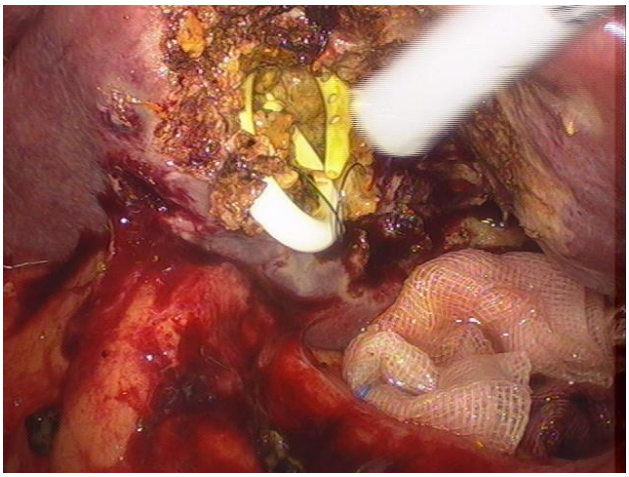

Fig. 4. Necrotic tissue area in the gallbladder bed was observed after cholecystectomy in operation field image.

this recently fell to approximately 0.8%.[1] The reason for this decrease in incidence is that recently, more cholecystectomy of symptomatic gallbladder stones has been carried out than in the past, and there is a tendency to conduct surgical treatment for acute cholecystitis at an early stage. Niemeier classified a gallbladder perforation into three types: type 1, chronic perforation with the presence of a fistulous communication between the gallbladder and some other viscus; type 2, subacute perforation where the perforated gallbladder is surrounded by an abscess walled off by adhesions from the general peritoneal cavity; and type 3, acute perforation of the gallbladder into the free peritoneal cavity without protective adhesions.[2] A gallbladder perforation occurs mainly in the fundus beause the blood supply is weakest in it. The morbidity and mortality due to a gallbladder perforation have been reported to be 37% and 7%, respectively. The risk factors for gallbladder perforation are old age, male gender, and cardiovascular comorbidity.[1] Most of the gallbladder perforations are acute cholecystitis due to gallstones. On the other hand, acute acalculous cholecystitis may cause gallbladder perforation because acute acalculous cholecystitis is more common in sepsis and other co-morbidities than in other patients. A gallbladder perforation usually begins with cystic duct obstruction by gallstones. This phenomenon causes bile stasis and gallbladder distension and increases the pressure in the gallbladder, interfering with venous and lymphatic drainage, eventually damaging the blood vessels causing gallbladder necrosis and perforation. An intrahepatic gallbladder is buried within the liver tissue, and a perforation wound results in a hepatic abscess.[3]

A gallbladder perforation has no specific clinical manifestations. The symptoms may occur acutely or slowly, and pain may decrease suddenly at the time of the perforation. General weakness and weight loss may occur over a long period and may be considered to be a malignant tumor.[4] Interestingly, this patient did not have Murphy's sign because the peritoneal layers did not appear to be affected. An elevation of liver enzymes, particularly alkaline phosphatase, is common in blood tests. A 'hole sign', indicating that a gallbladder wall defect on ultrasonography, is useful for diagnosing gallbladder perforation. But, it may be difficult to be visualized by ultrasonography due to bowel gas and pain.[5] For this reason, it is better to perform a CT scan. According to Pedrosa et al.,[6] the direct indicators of perforation on a CT scan include a demonstration of either calculi outside the gallbladder or a ruptured segment of the gallbladder wall. Indirect indicators include a demonstration of an abscess outside the gallbladder, presence of gallstones, and thickening of gallbladder wall. In the present case, a 'hole' can be found between the gallbladder wall and liver abscess (Fig. 1).

Because this complication is rare, it is difficult to standardize the treatment. On the other hand, it is reasonable to perform interval open cholecystectomy after percutaneous drainage in addition to antibiotics to control a pyogenic liver abscess.[4,7-9] If percutaneous transhepatic drainage or aspiration is contraindicated or anatomically impossible, recently introduced techniques, such as ultrasound-guided transduodenal (or transgastric) gallbladder drainage with stenting and endoscopic transpapillary gallbladder stenting, can be applied.[10] Although laparoscopic cholecystectomy may be troublesome due to adhesion and severe inflammation, it could be performed successfully in selected cases, as in this patient.

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