



with EBV or ParvoB19 virus.⁹ The mechanisms, however, remain poorly understood, although three key hypotheses have been proposed, which could also exist in the present case: molecular mimicry; polyclonal lymphocyte activation; and epitope spreading.¹⁰ The present patient did not have any health problems prior to the toxocariasis diagnosis and developed relapsing symptoms of SLE a few weeks later.

The present report emphasizes the fact that *T. canis* infection should be considered as a rare cause of glomerulopathy, especially when hypereosinophilia is noted. The similarity to SLE could initially mislead the physician, but long-term follow up and outcome would lead the physician to the appropriate diagnosis in the case of relapse.

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Acute acalculous cholecystitis with eosinophilic infiltration

Yuki Muta,¹ Akio Odaka,¹ Seiichiro Inoue,¹ Masahiko Komagome,¹ Yoshifumi Beck,¹ Masanori Tamura² and Eiichi Arai³

¹Departments of ¹Hepato-Biliary-Pancreatic and Pediatric Surgery, ²Pediatrics, and ³Pathology, Saitama Medical Center, Saitama Medical University, Kawagoe City, Saitama, Japan

Abstract We report a case of acute acalculous cholecystitis with eosinophilic infiltration. A previously healthy 6-year-old boy was referred with right abdominal pain. Imaging demonstrated marked thickening of the gallbladder wall and peri-cholecystic effusion. Acute acalculous cholecystitis was diagnosed. Symptoms persisted despite conservative treatment, therefore cholecystectomy was performed. Pathology indicated infiltration of eosinophils into all layers of the gallbladder wall. The post-operative course was uneventful and the patient has had no further symptoms. Eosinophilic cholecystitis is acute acalculous cholecystitis with infiltration of eosinophils. The causes include parasites, gallstones, allergies, and medications. In addition, it may be seen in conjunction with eosinophilic gastroenteritis, eosinophilic pancreatitis, or both. An allergic reaction to abnormal bile is thought to be the underlying cause. The present case did not fulfill the diagnostic criteria of eosinophilic cholecystitis, but this may have been in the process of developing.

Key words acute acalculous cholecystitis, children, eosinophilic cholecystitis.

Acute acalculous cholecystitis is a rare disease in children.¹ Eosinophilic cholecystitis is acute acalculous cholecystitis associated with infiltration of eosinophils into the gallbladder wall. It is a rare form of cholecystitis that was first described in the French literature in 1949.² We report a case of acute acalculous cholecystitis with eosinophilic infiltration.

Correspondence: Yuki Muta, MD, Department of Hepato-Biliary-Pancreatic and Pediatric Surgery, Saitama Medical Center, Saitama Medical University, Kamoda 1981, Kawagoe City, Saitama 3508550, Japan. Email: ymuta@saitama-med.ac.jp

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Case report

A previously healthy 6-year-old boy was referred with a 4 day history of right-sided abdominal pain. His temperature was 37.4°C, but the other vital signs were normal. Initial laboratory tests showed a white blood cell count of 15 600/mm³, with no increase in eosinophils. Serum total bilirubin was 0.5 mg/dL, aspartate aminotransferase was 23 U/L, alanine aminotransferase was 13 U/L, and C-reactive protein was 4.0 mg/dL. Abdominal ultrasound and enhanced computed tomography (CT) demonstrated marked enlargement of the gallbladder. The gallbladder wall was thickened and contrast enhancement was reduced, but there were no gallstones (Fig. 1). We diagnosed acute acalculous cholecystitis, and started

conservative treatment with antibiotics and nil orally. The physical findings and inflammatory parameters initially improved, but abdominal pain recurred when he resumed oral intake. Laboratory tests showed a white blood cell count of $8900/\text{mm}^3$, and eosinophils had increased to $620/\text{mm}^3$. Drip infusion cholecystocholangiography-CT (DIC-CT) failed to demonstrate enhancement of the gallbladder lumen (Fig. 2). Torsion of the gallbladder could not be excluded on DIC-CT, therefore exploratory laparoscopy was performed. Laparoscopy showed an inflamed gallbladder with thickened walls, indicating that relapse of the symptoms was due to cholecystitis. The common bile duct was not edematous or swollen where it could be observed. There was marked thickening of the gallbladder wall, but no biliary sludge or gallstones. A sample of bile was not collected, so its composition was unknown. Cholecystectomy was performed. Pathology indicated infiltration of eosinophils and neutrophils into all layers of the gallbladder wall, as well as perivascular infiltration of histiocytes. Eosinophils accounted for approximately 60% of the infiltrating cells (Fig. 3). Granulomatous vasculitis is a disease that causes systemic eosinophilic infiltration. To detect granulomatous vasculitis, we performed elastica van Gieson (EVG) staining to observe vascular damage and CD 68 staining to identify histiocytes. Discontinuity of the internal elastic lamina was seen on EVG staining of the vessel walls, and perivascular infiltration of histiocytes was seen on CD68 staining, but the findings were not consistent with granulomatous vasculitis. Although infiltration of eosinophils could suggest a diagnosis of allergic granulomatous vasculitis, anti-neutrophil cytoplasmic antibody (ANCA) was negative, there was no systemic eosinophilia, and no evidence of conditions such as eosinophilic gastroenteritis. From operative and pathological findings, the diagnosis was acute cholecystitis with significant eosinophil infiltration and the merger of secondary systemic

eosinophil infiltration. The number of eosinophils was reduced to $260/\text{mm}^3$ on postoperative day 1. At that time the eosinophil count was high at approximately $400/\text{mm}^3$, but the patient had no symptoms such as vasculitis or allergic reactions. The symptoms improved immediately after surgery and the postoperative course was uneventful.

Discussion

Acute acalculous cholecystitis is rare in children. It has been known to occur during the course of infectious diseases, as well as in patients on total parenteral nutrition, and after surgery, trauma, and extensive burns.¹ Suggested causes of acute acalculous cholecystitis include decreased blood flow to the gallbladder, biliary tract obstruction, and hyperconcentration of the bile.³ The clinical and laboratory features of acute acalculous cholecystitis are ambiguous,⁴ so this disease often progresses to necrosis or perforation.⁵ Delay or failure in making the diagnosis can result in increased morbidity and mortality.⁴ In the present patient, imaging was suggestive of acute acalculous cholecystitis, including thickening of the gallbladder wall and fluid around the gallbladder. The underlying cause, however, could not be identified on imaging. The present case suggests that early surgical treatment is useful for acute acalculous cholecystitis in children when conservative therapy is ineffective.

Eosinophilic cholecystitis is acute acalculous cholecystitis associated with infiltration of eosinophils. It has been reported in 0.5–6.4% of excised gallbladders.⁶ Histologically, the characteristic finding is dense, transmural infiltration of leukocytes (>90% eosinophils).⁷ Known causes of eosinophilic cholecystitis include parasites, gallstones, allergies, and medications, while it is also found in conjunction with eosinophilic gastroenteritis and/or eosinophilic pancreatitis. This condition is thought to represent an

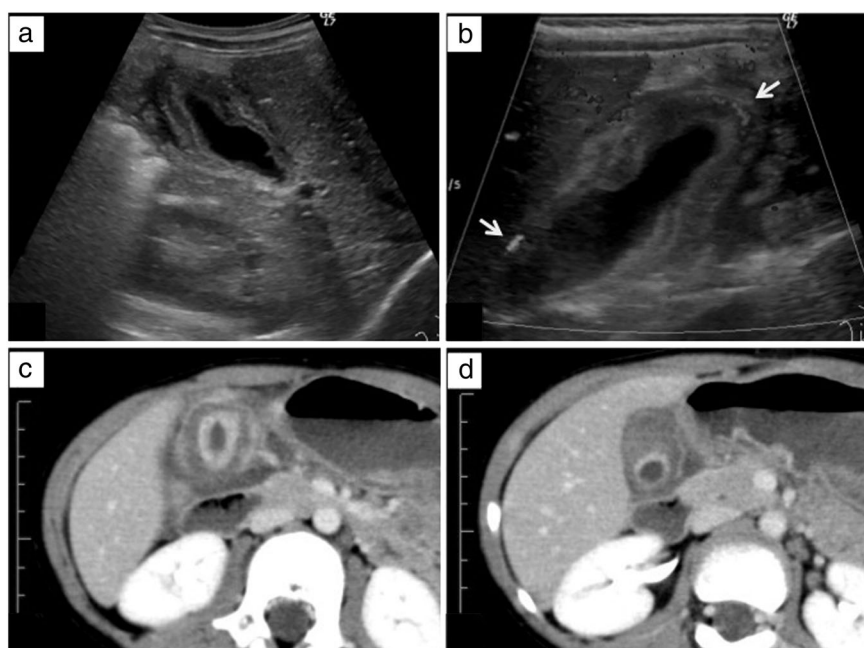


Fig. 1 Abdominal ultrasonography (US) showing (a) gallbladder wall thickening and effusion around the gallbladder. (b) Blood flow in the gallbladder wall observed on color Doppler (arrows). (c,d) Contrast-enhanced abdominal computed tomography (CT) showing gallbladder wall thickening and a reduced contrast effect. There is also effusion around the gallbladder. Gallstones and biliary sludge were not observed on US or CT.

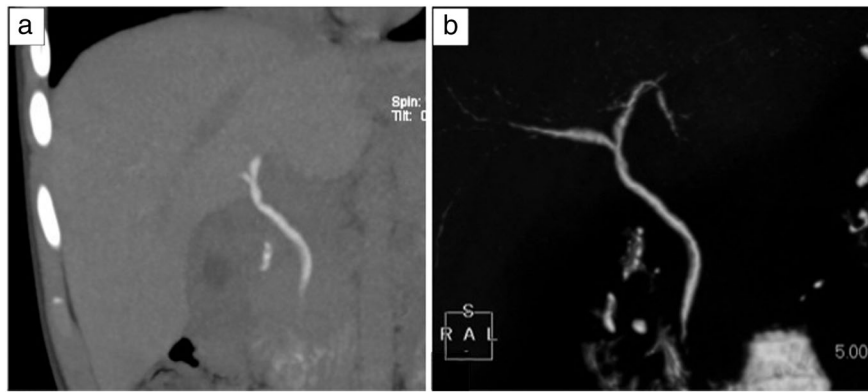


Fig. 2 (a,b) Drip infusion cholecystocholangiography-computed tomography after relapse of symptoms. There is no obstruction of the common bile duct or the right and left hepatic ducts. The cystic duct and gallbladder are not visualized. Obstruction of the cystic duct was suspected, but there were no stones or tumors.

allergic reaction to abnormal bile, but is not necessarily associated with systemic eosinophilia.

The frequency of eosinophilic cholecystitis in children is unknown, but it seems to be rare. A search of Pubmed for “eosinophilic cholecystitis” + “children” or “pediatrics” identified four papers that described two cases of eosinophilic cholecystitis in children. Both patients also had other diseases associated with eosinophilic infiltration.

Symptoms of eosinophilic cholecystitis resemble those of acute cholecystitis.⁸ In the present patient, we could not make a histological diagnosis of eosinophilic cholecystitis because eosinophils accounted for only approximately 60% of the infiltrating cells. There was, however, no underlying cause of acute cholecystitis, suggesting that eosinophilic infiltration of the gallbladder was involved in causing the cholecystitis symptoms.

The following four disease states must be considered in patients with eosinophilic cholecystitis: parasitic infection, reactions to medications, allergic granulomatous vasculitis, and eosinophilic gastroenteritis.⁷ Parasites were not detected in the present patient on imaging, there was no eosinophilia at admission, and he was not on any medications. In addition, ANCA was negative, making allergic granulomatous vasculitis unlikely. Because we did not perform biopsy of the gastrointestinal mucosa, the possibility of eosinophilic gastrointestinal disease cannot be excluded, but the patient had no symptoms apart from those related to the gallbladder. There was no peripheral eosinophilia at the initial examination, making it difficult to suspect acute cholecystitis due to infiltration of eosinophils.

Eosinophilic cholecystitis can be diagnosed only on resection or biopsy, but is important to consider in the preoperative differential

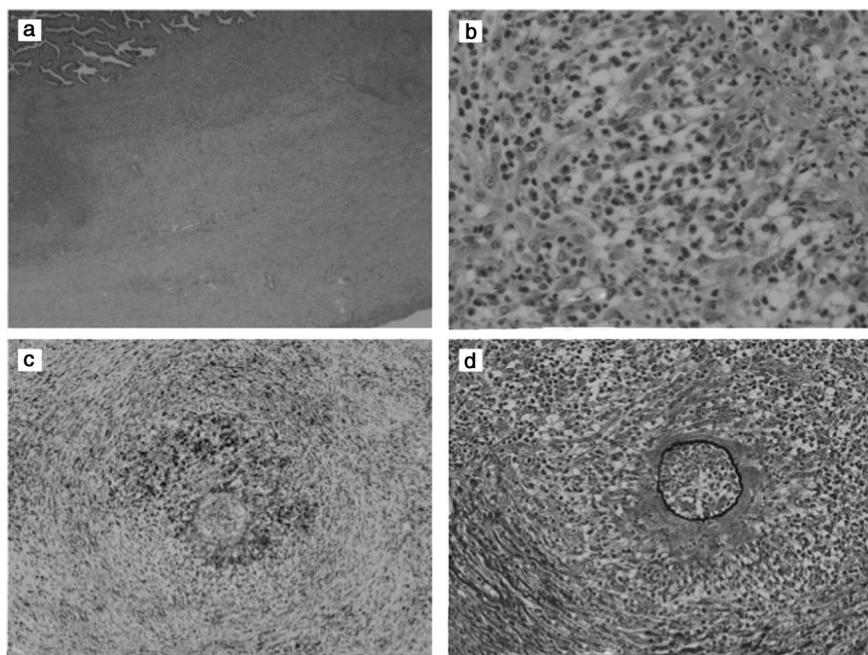


Fig. 3 (a,b) Hematoxylin–eosin staining: infiltration of eosinophils along with neutrophils and lymphocytes is prominent in all layers of the gallbladder wall, including the lamina propria. Full-thickness inflammation is observed in the arteries of the muscle layer, with prominent infiltration of eosinophils and perivascular infiltration of histiocytes. (c) CD68 staining: infiltration of histiocytes in the perivascular region is consistent with granulomatous vasculitis. (d) EVG staining: there is discontinuity of the internal elastic lamina of the vessel wall.

diagnosis. In adults who have peripheral eosinophilia or another disease associated with eosinophilic infiltration, a diagnosis can be reached on endoscopic biopsy of the gastrointestinal tract or bile duct. To diagnose eosinophilic cholecystitis preoperatively in a child with acalculous cholecystitis, it would likewise be necessary to identify other diseases associated with eosinophilic infiltration or detect peripheral eosinophilia. It is still likely, however, that the condition would be diagnosed only after cholecystectomy. The present patient had no findings suggestive of eosinophilic cholecystitis, making preoperative diagnosis very difficult. This case emphasizes the importance of keeping eosinophilic cholecystitis in mind when examining other patients with similar symptoms.

In the present patient, <90% of the infiltrating leukocytes were eosinophils, therefore he did not fulfill the diagnostic criteria for eosinophilic cholecystitis.

Eosinophilia was detected in the present patient when abdominal pain recurred during conservative therapy, but did not fully improve after cholecystectomy. Eosinophilic infiltration of the gallbladder may have been related to systemic eosinophilia, resembling eosinophilic cholecystitis, therefore long-term follow-up of the present patient is required due to the possibility of another eosinophilic disease emerging. The present patient had severe symptoms of acute acalculous cholecystitis, and eosinophils accounted for <90% of infiltrating leukocytes, hence eosinophilic

cholecystitis may have been present in the early stage. It is necessary to consider similar cases.

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Successful treatment of relapsed anaplastic large cell lymphoma with vinblastine monotherapy and allo-HSCT with reduced intensity conditioning regimen

Satoshi Miyagaki,¹ Toshihiko Imamura,¹ Yoshiki Okumura,¹ Ikuyo Ito,¹ Atsushi Fujiki,² Shinya Osone,¹ Hiroyuki Ishida^{1,2} and Hajime Hosoi¹

¹Department of Pediatrics, Graduate School of Medical Science, Kyoto Prefectural University of Medicine, Kyoto and ²Department of Pediatrics, Matsushita Memorial Hospital, Moriguchi, Japan

Abstract Relapsed anaplastic large cell lymphoma (ALCL) is chemosensitive, but recurrence is common. Although vinblastine (VLB) monotherapy is an effective treatment for relapsed ALCL, the optimal treatment duration is unknown, and some patients experience further relapse after completing the treatment. Allogeneic hematopoietic stem cell transplantation (allo-HSCT) is also an effective treatment for relapsed ALCL, although transplant-related toxicity is a problem. Here, we report an 11-year-old patient with relapsed ALCL who underwent induction therapy with VLB monotherapy and achieved complete remission (CR) after 12 courses. CR was confirmed on positron emission tomography–computed tomography. The patient then underwent allo-HSCT with reduced intensity conditioning (fludarabine, melphalan, and low-dose total body irradiation). He developed grade II acute graft-versus-host disease (GVHD), which was successfully treated with methylprednisolone. There was no evidence of chronic GVHD. He has remained in CR without any complications for 19 months after allo-HSCT.

Key words allogeneic hematopoietic stem cell transplantation, anaplastic large cell lymphoma, reduced intensity conditioning, vinblastine.

Correspondence: Toshihiko Imamura, MD, Department of Pediatrics, Kyoto Prefectural University of Medicine, Kajii-cho, Hirokoji, Kamigyo-ku, Kyoto 602-8566, Japan. Email: imamura@koto.kpu-m.ac.jp

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Anaplastic large cell lymphoma (ALCL) comprises approximately 20–30% of pediatric non-Hodgkin lymphoma. In >90% of patients, the disease is associated with t(2;5) (p23;q25), which results in expression of the nucleophosmin–anaplastic lymphoma kinase (NPM/ALK) fusion protein.¹ ALCL is chemosensitive, and