A case of gastroduodenal ulcer complicating Kawasaki disease

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Kawasaki disease (KD) is a systemic vasculitis associated with various clinical manifestations and complications, such as gastrointestinal abnormalities. We report a 3-year-old boy who presented with hematemesis and diffuse gastroduodenal ulcerations complicating KD. He received standard medical therapy for the disease and gastric ulcer, which showed effect after a few days. Although rare, peptic ulcers should be considered a complication of KD to ensure early diagnosis and treatment as it may cause severe morbidity.

Key words: Child; Endoscopy; Hematemesis; Mucocutaneous Lymph Node Syndrome; Peptic Ulcer

Introduction

Kawasaki disease (KD) is a systemic, idiopathic vasculitis that occurs predominantly in infants and children younger than 5 years.1,2) Current paradigm regarding KD is that this condition represents an immunological reaction in genetically susceptible hosts following exposure to various environmental triggers, such as infections.3) Diagnosis of KD is based on the following clinical criteria: fever lasting > 5 days and the presence of ≥ 4 of the following 5 clinical features (oropharyngeal changes, bilateral bulbar conjunctival injection without exudate, rash, changes in the extremities, and cervical lymphadenopathy measuring ≥ 1.5 cm in diameter4-5). Although KD is typically self-limited, it can develop complications, including coronary artery abnormalities, ventricular dysfunction, peripheral arterial obstruction, neurological involvement, urinary abnormalities, and gastrointestinal manifestations.6-8). Vomiting, diarrhea, and abdominal pain are common gastrointestinal manifestations associated with KD. Anecdotally, pseudo-obstruction, hemorrhagic duodenitis, appendicitis, and intussusception have been reported6-7).

We report a 3–year-old boy who presented with hematemesis and gastroduodenal ulcer complicating KD. To date, the gastrointestinal manifestations have not been reported as complications of KD,
This study was approved by the Ethical Committee of Yonsei University College of Medicine, Severance Hospital (IRB No. 4-2019-0573).

Case

A previously healthy, 3-year-old boy presented with fever and neck swelling lasting for 1 day. On the second day after being admitted to an outside hospital, he developed strawberry tongue, rash over the trunk, conjunctival injection, and edema of the hands. He received supportive therapy with antibiotics for a high index of clinical suspicion for KD. Intravenous immunoglobulin (IVIG) and aspirin were not administered due to fever lasting shorter than 5 days, making it difficult to diagnose KD. Three days after the first fever, he developed hematemesis. Esophagogastroduodenoscopy (EGD) showed gastroduodenal ulcer (Fig. 1). He was referred to Severance Children’s Hospital for treatment of KD complicated by gastroduodenal ulcer.

The initial vital signs were as follows: blood pressure, 107/45 mmHg; heart rate, 157 beats per minute; respiratory rate, 26 breaths per minute; and temperature, 39.4°C. Physical examination showed swollen neck, erythema of the tongue, oral and pharyngeal mucosa, conjunctival injection, and edematous hands and feet. No abdominal tenderness, hepatosplenomegaly or other findings suggestive of KD manifestations were noted.

Initial laboratory tests showed a hemoglobin concentration of 10.2 g/dL, white blood cell count of 6,980/mm³, platelet counts of 293,000 cells/μL, erythrocyte sedimentation rate of 10 mm/hr, and C-reactive protein (CRP) of 124.2 mg/L. A stool test for occult blood showed positive results. Chest and abdominal radiographs showed no abnormalities. He was diagnosed with a gastric ulcer complicating KD, and intravenous pantoprazole was administered, along with IVIG at a dose of 2 g/kg.

Compared to the previous EGD performed at the outside hospital, EGD performed on day 3 showed improvement of the ulcers. No active bleeding was observed, but diffuse, persistent ulceration was identified in the same position as before, extending along the gastric antrum to the second portion of the duodenum (Fig. 2), similar

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Fig. 1. Esophagogastroduodenoscopy performed at an outside hospital, showing diffuse ulceration extended along the gastric antrum (A) to the second portion of the duodenum (B).
to the EGD findings at the external hospital. Biopsy showed ulceration with acute inflammation but without any evidence of Epstein–Barr virus (EBV) or cytomegalovirus (CMV) infection (Fig. 3).

Blood and fecal cultures showed no abnormalities suggestive of bacterial infection. Polymerase chain reaction was also performed to exclude viral infections such as EBV or CMV, and the test result was negative. His serum calcitonin concentration was 1.5 pg/mL, and fasting gastrin concentrations measured on 3 separate occasions were 87.1, 19.4, and 34.3 pg/mL, which ruled out a hypersecretory state such as Zollinger–Ellison syndrome.

High-dose aspirin was not administered owing to the ulcer, and intravenous dexamethasone therapy was initiated at a dose of 0.3 mg/kg/day to treat inflammation.

Echocardiography performed on day 8 showed small coronary artery aneurysms involving the left anterior descending artery (diameter = 2.1–2.8 mm, Z score 1.25–3.23) and the right coronary artery (diameter = 3.0 mm, Z score 3.53). Abdominal

Fig. 2. Esophagogastroduodenoscopy findings on day 3, showing improvements compared with the prior findings (A, B).

Fig. 3. Microscopic findings showing mucosal erosion (arrow) of the gastric antrum (A), necroinflammatory exudates and reactive changes of mucosal tissue (arrow) at the second portion of duodenum (B) (H & E, × 200).
ultrasonography showed no abnormalities indicative of other gastrointestinal and hepatic complications. No further episodes of hematemesis occurred until day 9, and follow-up CRP level decreased to 24.2 mg/L. He was discharged, and outpatient follow-up was scheduled.

**Discussion**

Peptic ulcer disease is less common in children than in adults. Notably, this condition can cause significant morbidity and mortality secondary to complications such as severe hemorrhage and/or perforation, Helicobacter pylori infection, Crohn’s disease, stress, drugs, allergic or eosinophilic gastritis, hypersecretory states such as Zollinger–Ellison syndrome, and/or autoimmune diseases among other causes serve as etiopathogenetic contributors to peptic ulcer disease in children.

According to reports in the available literature, several gastrointestinal complications are known to occur in patients with KD. Gastrointestinal hemorrhage is reported in patients administered high-dose aspirin after being diagnosed with KD. In our patient, we observed a gastric ulcer that was not associated with treatment for KD. The ulcer in the patient was of a more severe grade and wider extent than ulcers secondary to other common causes, such as stress. Thus, the ulcer was considered a complication of KD rather than the other secondary causes. In this case, the pathological findings suggesting peptic ulcer were limited by insufficient depth of the specimens and consequent incomplete exclusion of other causes that can cause hematemesis, such as Henoch–Schönlein purpura. The pathogenesis of peptic ulcers in patients with KD may be attributed to persistent fever and stress secondary to vasculitis involving the stomach and duodenum. However, this theory needs more evidence.

To summarize, we reported a 3-year-old boy who presented with hematemesis and gastroduodenal ulcer complicating KD. He was treated with IVIG and dexamethasone for KD, and a proton pump inhibitor was administered to treat gastric ulcer. The latter regimen successfully treated the hematemesis, and follow-up EGD showed an improved gastric ulcer. Despite its rarity as a complication of KD, gastric ulcer may cause severe morbidity. This condition should be considered in suspicious cases to ensure early diagnosis and treatment.

**Conflicts of interest**

No potential conflicts of interest relevant to this article were reported.

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