HK J Paediatr (new series) 2011;**16**:51-55

Kawasaki Disease Presenting as Intestinal Pseudo-obstruction in a Three-year-old Boy

JHM ***Young***, LTW ***Chan***, KF ***Huen***

Abstract Typical clinical presentations of Kawasaki disease (KD) are well known to paediatricians. Abdominal pain, vomiting, diarrhoea and hydrops of gallbladder are the commonest gastrointestinal presentations of KD, while acute surgical abdomen or severe gastrointestinal complication as a presenting sign is rare. We report a case of a three-year-old previously healthy boy with KD whose gastrointestinal symptoms and signs were present at the onset, which subsequently progressed to intestinal pseudo-obstruction syndrome, and the condition responded to bowel rest, intravenous immunoglobulin and oral aspirin treatment, without any complications. We suggest that KD should be considered a differential diagnosis of a child presenting with fever and intestinal pseudo-obstruction without identifiable cause, and high index of suspicion of atypical KD should be taken as prompt diagnosis and treatment can prevent serious long term consequences.

Key words Intestinal pseudo-obstruction; Kawasaki disease

Introduction

Kawasaki disease (KD) is commonest in Japan where the reported incidence rate (3.4-100/100,000) is 10 times higher than that in the USA.[1] Taiwan, after Japan, has the second highest incidence rate of KD among children under five years old.[2] Gastrointestinal symptoms and signs comprise about 2.3% in the clinical presentations of KD, acute surgical abdomen or severe gastrointestinal complication as a presenting sign being rare.[3] We report a case of a three-year-old previously healthy boy, with gastrointestinal presentations, developed typical features of KD two days later and progressed to intestinal pseudo-obstruction syndrome.

Department of Paediatrics and Adolescent Medicine, Tseung Kwan O Hospital, 2 Po Ning Lane, Hang Hau, Tseung Kwan O, N.T., Hong Kong, China

JHM **Young**（楊康明） *MBChB(CUHK), MRCPCH*
LTW **Chan**（陳子宏） *MBChB(CUHK), FHKCPaed, FHKAM(Paed)*
KF **Huen**（禤桂芬） *FRCPCH, FHKCPaed, FHKAM(Paed)*

Correspondence to: Dr JHM **Young**

Received November 5, 2010

Case Report

A three-year-old previously healthy boy presented with two-day history of generalised colicky abdominal pain and repeated vomiting of undigested food. He was given rectal dimenhydrinate and oral hyoscine by private doctors. Worsened as the condition got, he was admitted to the paediatric ward. On examination, he was non-toxic and first noted to have body temperature of 38°C. His abdomen was mildly distended with sluggish bowel sounds, believed to be attributed by the drugs given by his own doctors. The abdominal X-ray (AXR) showed prominent bowel loops without air-fluid levels (Figure 1). The provisional diagnosis was gastritis. Soon after admission, he began to have watery diarrhoea and high swinging fever (peak >39°C). On day 2 of admission, he developed non-specific, polymorphic, non-

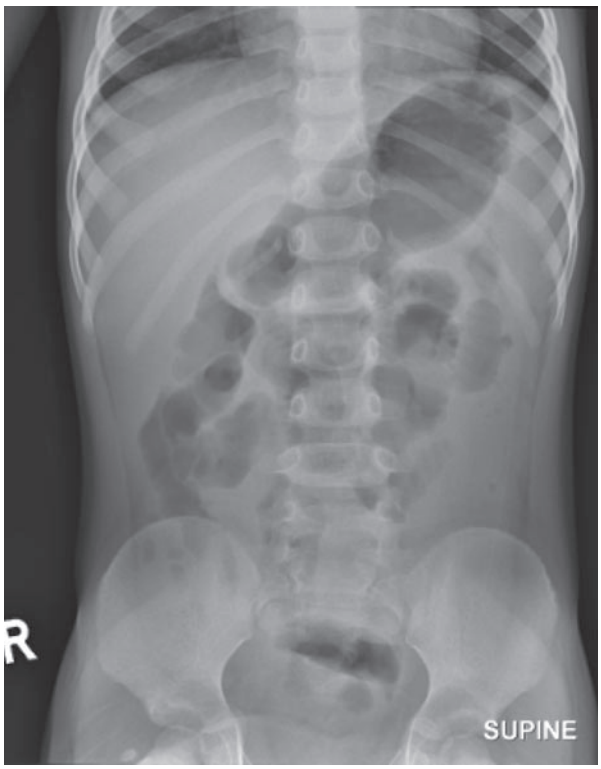

Figure 1 Admission AXR: prominent bowel loops without air-fluid levels.

itchy, maculo-papular erythematous rash over trunk, bilateral non-purulent conjunctivitis, transient erythema over palms of both hands and cracked lips. No enlarged cervical lymph node could be found.

On day 3 of admission, he started to have bilious vomiting, progressive abdominal distension with abdominal pain. The repeated AXRs showed bowel wall thickening, dilated bowels and air-fluid levels which were consistent with bowel obstruction (Figure 2). Complete blood picture showed mild anaemia (haemoglobin 10.6 g/dL), raised white blood cell count (total: 15.7 x 10^9/L, neutrophil 10.3 x 10^9/L, lymphocyte 4.0 x 10^9/L), and normal platelet count (318 x 10^9/L). Erythrocyte sedimentation rate (ESR) was elevated to 71 mm/hr and C-reactive protein (CRP) was increased to 143 mg/L. Hypoalbuminaemia (serum albumin 27 g/L) with normal liver transaminase level were noted. Computed tomography of the abdomen showed generalised dilatation of both small and large bowels including the rectum, without free gas or abscess collection in the abdomen or pelvis. Echocardiogram showed no signs of coronary artery dilation.

The clinical diagnosis was Kawasaki disease, complicated with intestinal pseudo-obstruction syndrome. The boy was treated with one dose of intravenous

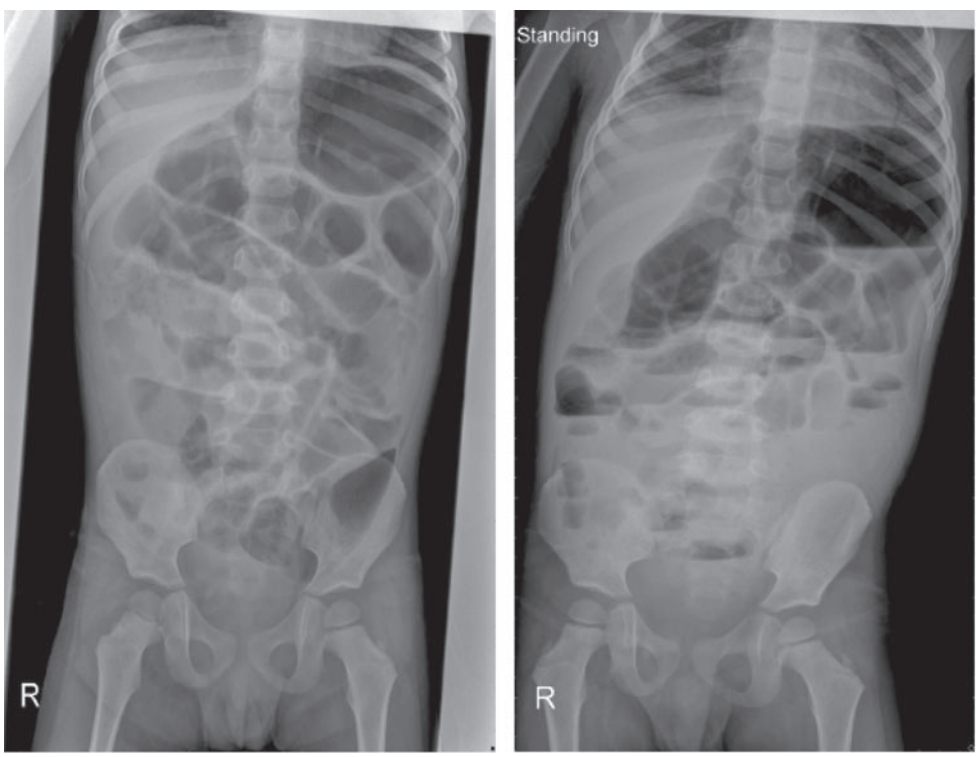

Figure 2 The repeated AXRs taken on day 3 of admission: bowel wall thickening, dilated bowels and air-fluid levels consistent with bowel obstruction.

immunoglobulin (IVIG) (2 g/kg body weight). Oral aspirin was withheld initially for the risk of gastrointestinal bleeding. High dose aspirin (80 mg/kg body weight/day) was given, including a histamine-2 receptor antagonist, when there was resolution of gastrointestinal symptoms and signs on the next day. Assessed by the surgeons, the boy was put on bowel rest with nasogastric tube drainage and intravenous fluid infusion, empirically added intravenous cefuroxime and metronidazole covering possible bacterial translocation.

Fever came down once IVIG infusion had completed. The gastrointestinal symptoms and signs gradually resolved as further proved by the regression of bowel dilatation over serial AXRs. The boy was kept nil by mouth for two days and he could tolerate soft diet four days after IVIG infusion.

He was discharged home with low dose aspirin (5 mg/kg body weight/day) on day 11 after the initial presentation of KD. Peri-ungual desquamation was noted on week two. Inflammatory markers began to normalise and repeated echocardiograms on weeks two and four showed no coronary artery dilatation. Follow-up consultation on week four showed no evidence of intestinal obstruction. Aspirin was continued for another eight weeks.

Discussion

Typical clinical presentations of KD are well known to paediatricians. To diagnose KD, fever is an essential feature and it must last for at least five days' duration, together with at least four of the five principal criteria without any other explanation for the illness.[4] Recently patients with atypical or incomplete KD are being identified with increasing frequency.[5] Hence the true incidence is probably unknown as there are under-reporting for those mild forms, which have not been under medical attention. In our case, the patient initially presented with only gastrointestinal symptoms and signs, high swinging fever along with other typical features of KD occurred two days after the initial gastrointestinal presentations.

Gastrointestinal symptoms and signs comprise about 2.3% in the clinical presentations of KD – diarrhoea, vomiting, abdominal pain and hydrops of gallbladder being the commonest.[3] The pathogenesis of gastrointestinal involvement is thought to be related to mesenteric small vessel vasculitis with bowel ischaemia and associated myenteric plexus dysfunction.[6] Acute surgical abdomen or severe gastrointestinal complication as a presenting sign in KD is rare.[3] The term intestinal pseudo-obstruction syndrome refers to the clinical symptomatology of a serious ileus without signs of mechanical gut obstruction, plus prominent gaseous bowel dilatation shown in AXR.[7] In 1987, Miyake et al[6] described seven of 310 (4.4%) of KD patients over a period of 10 years who suffered from symptoms of intestinal paralysis during the acute stage. Among these seven cases, three of them showed typical intestinal pseudo-obstruction radiologically. Yaniv et al[3] in 2005 searched the English literature from 1979 to 2002 and only found 18 reports of KD patients with surgical complications, excluding hydrops of gallbladder as it was relatively common in KD. From their review, surgical presentations in KD comprised small bowel obstruction and strictures, pseudo-obstruction, intussusceptions, ischaemic colitis, perforation of duodenum, haemorrhagic enteritis, appendicitis and pancreatitis. They also found that features of small bowel pathology included degeneration, necrosis, desquamation of the epithelial cells, inflammatory exudates in the lamina propria and muscular layer, and thrombosis of small submucosal arteries or submucosa haemorrhage. Zulian et al[8] described an incidence rate of 4.6% among a cohort of 219 KD children in Italy, the highest reported incidence rate of acute surgical abdomen in KD. Nine of these 10 KD patients underwent a surgical intervention before the diagnosis of KD became evident and three of these 10 KD patients had functional obstruction secondary to paralytic ileus. However the authors commented that this study was not epidemiologic and had marked referral bias, on which, data from only two tertiary care units were based.

It is possible that in KD patients with acute surgical presentations, bacteria colonising the small intestinal mucosa may produce exotoxins which act as superantigens with subsequent V[beta]2+ T cells expansion, which further explains why some patients with KD have gastrointestinal complaints at the onset of disease.[9] The gastrointestinal tract might be one of the primary sites of entry for etiologic agents in KD.[10] The occurrence of V[beta]2+ T cells was found to be selectively increased in small intestinal mucosa of patients in the acute phase of Kawasaki disease.[9] Gram-positive cocci were isolated from jejunal biopsies of KD patients predominantly: five kinds of streptococci and two kinds of staphylococci.[10] For these reasons, our patient was covered with systemic antibiotics for possible bacterial translocation.

For relieving gastrointestinal symptoms, the private doctors gave our patient dimenhydrinate, an anti-histamine, preventing and treating nausea, vomiting, or dizziness of motion sickness; and hyoscine, an anti-cholinergic, reducing motility and secretions in the gastrointestinal tract

and treating nausea, motion sickness and abdominal cramps. Uhlig et al[11] performed a randomised-controlled-trial randomly assigning 243 children with gastroenteritis and vomiting to either rectal dimendydrinate or placebo. Dimenhydrinate was found to reduce the frequency of vomiting in children with mild dehydration; however, the overall benefit was low, because it did not improve oral rehydration and clinical outcome.[11] The concomitant use of both dimenhydrinate and hyoscine in our case prior to admission could even be a contributing factor to ileus. Therefore we should be cautious in giving antiemetics or antispasmodics – no good, or even harm.

Prompt diagnosis and treatment is crucial in reducing the risk of coronary artery complications and mortality in KD.[12] Early IVIG treatment can reduce the incidence rate of coronary artery aneurysm from 25% to ~3%.[12] However, many cases of KD, manifesting itself atypical symptoms, for instance, gastrointestinal presentations as in our case, may delay the diagnosis of KD as well as the initiation of appropriate medical treatment. Akikusa et al[13] reported a 3-year-old boy presenting with intestinal pseudo-obstruction and the diagnosis of KD was made only after 12 days of admission. Tiao et al[7] described a two-year-old boy with intestinal obstruction on presentation who was diagnosed atypical KD one week later when signs of KD appeared. Cochrane review in 2003 recommended that the effective dose of IVIG should be given within 10 days of onset of KD, and that the benefit of preventing coronary artery complication may be up to 60 days.[14] This implied that even a child with a delayed diagnosis (for example, initial gastrointestinal symptoms obscuring the true diagnosis) may still benefit from treatment. As the other presenting features of KD were obvious, we started IVIG and aspirin treatment before the case had fully satisfied the criteria of establishing the diagnosis of KD. In some case reports, IVIG administered early at the time of bowel symptoms resulted in rapid improvement in abdominal condition.[8] In our case, there was obvious resolution of gastrointestinal symptoms and signs within one day of commencement of IVIG, without progression of serious complications like bowel ischaemia and/or genuine bowel obstruction.

A high incidence rate of coronary artery involvement was shown in KD patients suffering from intestinal pseudo-obstruction. In Miyake's case series, five of seven children with gut insult had coronary artery aneurysm;[6] while in Zulian's report, the coronary artery aneurysm rate was 50%.[8] Probably, the unfavorable cardiac outcome may be related to delay in diagnosis and initiation of IVIG treatment, or the severe intestinal presentation may represent a more significant pathophysiology. Our patient did not have any coronary arteritis as confirmed by serial echocardiograms, thanks largely to prompt diagnosis and treatment.

Surgery for KD patients with gastrointestinal symptoms and signs carries significant mobidity and mortality. Mercer and Carpenter[15] reported that four of 10 KD patients suffering from serious surgical complications were operated for various gastrointestinal presentations. The operative mortality was 25% but the aetiology was unknown. Singh et al[16] had revealed the literature and questioned the necessity of laparotomy if the diagnosis of KD was made earlier as the majority of the intra-abdominal and gastrointestinal manifestations did resolve with adequate treatment of KD. Thus prompt diagnosis and treatment of KD with surgical presentations may prevent unnecessary invasive laparotomy.

Another area of concern is the possibility of development of bowel stricture after the acute insult. A case report by Beiler et al described a nine-month-old girl with KD who initially presented with vomiting, abdominal pain and diarrhoea well before signs of KD appeared.[17] Although IVIG had been given, it was not mentioned clearly if it was given within 10 days of fever. The girl subsequently developed acquired proximal jejunal ischaemic stricture two weeks later requiring bowel resection. This possible late complication caused by mesenteric ischaemia may present two to four weeks after the initial onset of the disease. We reviewed our case at two and four weeks after the initial presentation and found no evidence of intestinal obstruction.

In summary, we report a case of a three-year-old boy with KD whose gastrointestinal symptoms and signs were present at the onset which subsequently progressed to intestinal pseudo-obstruction syndrome and the condition responded to bowel rest, IVIG and oral aspirin treatment, without any complications. KD should be considered a differential diagnosis of a child presenting with fever and intestinal pseudo-obstruction without identifiable cause. A high index of suspicion in diagnosing KD should be taken as the symptoms and signs may not be typical at the onset, allowing prompt diagnosis and treatment and preventing serious long term consequences.

References

1. Taubert KA, Rowley AH, Shulman ST. Nationwide survey of Kawasaki disease and acute rheumatic fever. J Pediatr 1991;119: 279-82.
2. Chang LY, Chang IS, Lu CY, et al. Epidemiologic features of

Kawasaki disease in Taiwan, 1996-2002. Pediatrics 2004;114: e678-82.
3. Yaniv L, Jaffe M, Shaoul R. The surgical manifestations of the intestinal tract in Kawasaki disease. J Pediatr Surg 2005; 40:e1-4.
4. American Heart Association Committee on Rheumatic Fever, Endocarditis, and Kawasaki Disease. Diagnostic guidelines for Kawasaki disease. Am J Dis Child 1990;144:1218-9.
5. Fukushige J, Takahashi N, Ueda Y, Ueda K. Incidence and clinical features of incomplete Kawasaki disease. Acta Paediatr 1994; 83:1057-60.
6. Miyake T, Kawamori J, Yoshida T, Nakano H, Kohno S, Ohba S. Small bowel pseudo-obstruction in Kawasaki disease. Pediatr Radiol 1987;17:383-6.
7. Tiao MM, Huang LT, Liang CD, Ko SF. Atypical Kawasaki disease presenting as intestinal pseudo-obstruction. J Formos Med Assoc 2006;105:252-5.
8. Zulian F, Falcini F, Zancan L, Martini G, Secchieri S, Luzzatto C, et al. Acute surgical abdomen as presenting manifestation of Kawasaki disease. J Pediatr 2003;142:731-5.
9. Yamashiro Y, Nagata S, Oguchi S, Shimizu T. Selective increase of V beta 2+ T cells in the small intestinal mucosa in Kawasaki disease. Pediatr Res 1996;39:264-6.
10. Yamashiro Y, Nagata S, Ohtsuka Y, Oguchi S, Shimizu T. Microbiologic studies on the small intestine in Kawasaki disease. Pediatr Res 1996;39:622-4.
11. Uhlig U, Pfeil N, Gelbrich G, et al. Dimenhydrinate in children with infectious gastroenteritis: a prospective, RCT. Pediatrics 2009;124:e622-32.
12. Newburger JW, Takahashi M, Burns JC, et al. The treatment of Kawasaki syndrome with intravenous gamma globulin. N Engl J Med 1986;315:341-7.
13. Akikusa JD, Laxer RM, Friedman JN. Intestinal pseudoobstruction in Kawasaki disease. Pediatrics 2004;113: e504-6.
14. Oates-Whitehead RM, Baumer JH, Haines L, et al. Intravenous immunoglobulin for the treatment of Kawasaki disease in children. Cochrane Database Syst Rev 2003;(4):CD004000.
15. Mercer S, Carpenter B. Surgical complication of Kawasaki disease. J Pediatr Surg 1981;16:444-8.
16. Singh R, Ward C, Walton M, Persad R. Atypical Kawasaki disease and gastrointestinal manifestations. Paediatr Child Health 2007; 12:235-7.
17. Beiler HA, Schmidt KG, von Herbay A, Löffler W, Daum R. Ischemic small bowel strictures in a case of incomplete Kawasaki disease. J Pediatr Surg 2001;36:648-50.