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Case Report

Multiple Giant Coronary and Multiple Systemic Arterial Aneurysms in an Infant with Kawasaki Disease

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ABSTRACT

We present the case of a 4-month-old infant diagnosed with Kawasaki disease (KD), who developed giant coronary artery aneurysms and multiple systemic artery aneurysms due to delayed diagnosis and treatment. Early recognition and timely management of KD are crucial in order to prevent life-threatening complications, particularly in young infants with atypical presentations.

Keywords: Systemic aneurysm, children, Kawasaki disease

Introduction

Kawasaki disease (KD) is one of the most common vasculitis in childhood and is typically self-limiting. However, delayed or missed diagnoses may result in severe cardiovascular complications, including coronary artery aneurysm, myocardial infarction, heart failure, and, rarely, systemic arterial aneurysms (1). In untreated patients, the incidence of coronary artery aneurysms is approximately 15% to 25%, but timely administration of intravenous immunoglobulin (IVIG) markedly reduces this risk. These aneurysms are most frequently observed in children under 12 months of age and may develop even in the absence of the classical clinical features of KD, particularly in infants (2). Although systemic arterial aneurysms are rare, they are often associated with giant coronary aneurysms and younger age at diagnosis (3). Early diagnosis in infants is especially challenging due to incomplete or atypical clinical presentations. Here, we report a rare case of KD in a 4-month-old infant who developed multiple giant coronary and systemic arterial aneurysms as a result of a delayed diagnosis.

Case Report

A four-month-old female infant was admitted to our hospital with persistent fever. One month prior, she had been hospitalized at another facility with a two-day history of fever. Laboratory tests at that time revealed

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pyuria, leukocytosis, and elevated C-reactive protein (CRP) levels. She was diagnosed with a urinary tract infection and started on third-generation cephalosporin therapy. During treatment, she developed a rash and conjunctival injection, which were interpreted as a drug reaction. As the fever persisted, repeated laboratory evaluations showed leukocytosis, normocytic normochromic anemia, thrombocytosis, elevated CRP levels, and hypoalbuminemia. An echocardiogram was performed with a preliminary diagnosis of KD; however, it revealed only a patent foramen ovale and minimal pericardial effusion, with normal coronary artery findings. Based on these results, KD was considered unlikely, and treatment was changed to carbapenem and glycopeptide antibiotics. The patient underwent evaluation for other causes of prolonged fever. A peripheral blood smear was normal, and no growth was observed in her urine, blood, or cerebrospinal fluid cultures. Brucella agglutination and *Mycoplasma pneumoniae* enzyme-linked immunosorbent assay tests were negative. Radiologic investigations, including chest X-ray, abdominal ultrasonography, and cranial magnetic resonance imaging, were unremarkable. Despite extensive evaluation over a total illness duration of 28 days, the etiology of the fever remained unclear. The patient was subsequently referred to our hospital for further assessment.

The patient's personal and family history were unremarkable. She was the only child of healthy, non-consanguineous parents. On physical examination, weight was 5.9 kg (25th percentile), height 62 cm (25th percentile), heart rate 155 beats per minute, respiratory rate 42 breaths per minute, blood pressure 90/47 mmHg, and body temperature 36.4 °C. A grade 3/6 systolic murmur was auscultated at the cardiac apex, accompanied by approximately 2×2 cm palpable masses with thrills in both axillary regions. Peripheral pulses were palpable, and circulation was normal. No findings suggestive of connective tissue disease were identified on examination.

Her laboratory results were as follows: white blood cell 13.77×10^3/μL, absolute neutrophil count 8.39×10^3/μL (61%), absolute lymphocyte count 3.2×10^3/μL (24%), hemoglobin 10.2 g/dL, platelet count 355×10^3/μL, albumin 32.7 g/L, CRP 138.4 mg/L, erythrocyte sedimentation rate 42 mm/hour, procalcitonin 0.38 μg/L, and troponin T 254 ng/L (normal range <14). Electrocardiogram demonstrated sinus tachycardia without ST-segment or T-wave abnormalities. Echocardiography revealed normal ventricular function, moderate mitral regurgitation, and a 5-mm pericardial effusion. A giant coronary artery aneurysm was identified in the right coronary artery (RCA), measuring 7.8 mm (Z-score +21.8), and in the left anterior descending artery (LAD), measuring 4.9 mm (Z-score +16.4) (4). No thrombus was detected within the aneurysms (Figure 1).

Computed tomography angiography revealed aneurysmal dilatations in the LAD and RCA, with multiple aneurysms along the RCA. Additional aneurysmal dilatations were observed in the subclavian arteries and their branches, as well as in the axillary, brachial, intercostal, lumbar, main iliac, and internal iliac arteries. No evidence of thrombosis or luminal obstruction was detected within the aneurysms (Figure 2).

The patient was diagnosed with KD, and treatment was initiated with IVIG (2 g/kg), acetylsalicylic acid

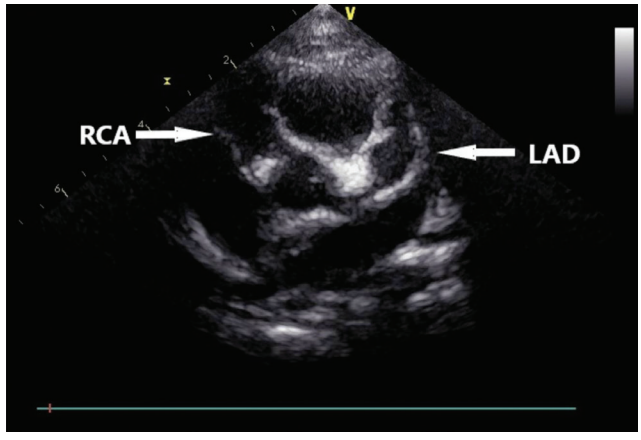

Figure 1. Giant coronary artery aneurysms showed from parasternal short-axis view
RCA: Right coronary artery, LAD: Left anterior descending artery

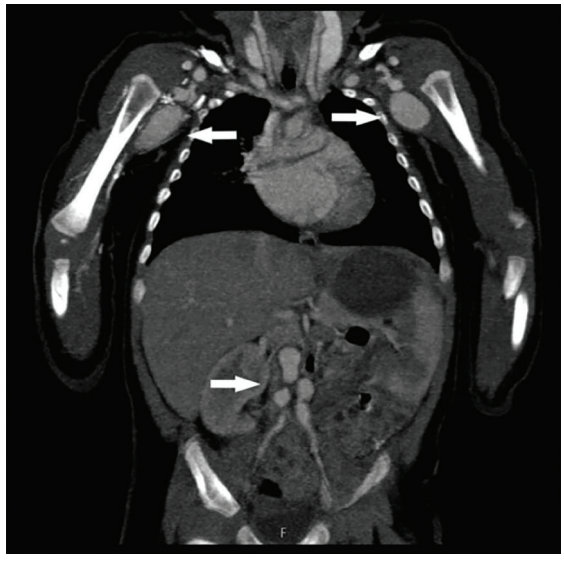

Figure 2. Computed tomography angiography showing multiple aneurysmal dilatations in systemic arteries

(80 mg/kg), clopidogrel (0.2 mg/kg), and enoxaparin (1 mg/kg). Within five days of IVIG administration, laboratory parameters normalized, and the patient remained afebrile. She was discharged on acetylsalicylic acid, clopidogrel, and enoxaparin, and continued to be followed up in our outpatient clinic.

Discussion

KD is a systemic vasculitis mostly affecting medium-sized arteries. It can lead to cardiovascular complications, primarily coronary artery aneurysms. Coronary artery aneurysms can result in serious morbidity and mortality (5). Administration of IVIG therapy within 10 days is recommended in order to prevent coronary artery aneurysms (2). Although IVIG treatment significantly reduces coronary artery aneurysms, they occur in 4% to 6% of cases and approximately 1% of cases develop giant coronary artery aneurysms (6). In this case report, we present a 4-month-old infant with a persistent fever lasting approximately one month, who was ultimately diagnosed with KD at a late stage. KD diagnosis is based on clinical criteria, and these criteria do not include echocardiographic findings.

Giant coronary artery aneurysms are associated with the highest risk of morbidity and mortality, and in these patients, shock, myocardial infarction or sudden death may occur (7). In the previous healthcare facility, the patient had a fever persisting for 17 days during her 28-day hospital stay. IVIG treatment was administered at our hospital on the 29th day of her illness. There were certain risk factors for coronary artery aneurysm such as her prolonged fever, her age being younger than 12 months, anemia, leukocytosis, hypoalbuminemia, and delayed treatment (4,8). Despite the presence of giant coronary artery aneurysm, complications such as thrombosis or myocardial infarction were not observed.

The prevalence of systemic arterial aneurysms in untreated KD has been reported to be approximately 2% (9). Aneurysms can occur in many systemic arteries, most commonly in the axillary, iliac, and brachial arteries. It has been reported that systemic arterial aneurysms are seen in 38.6% of patients with giant coronary artery aneurysms, and patients with multiple systemic arterial aneurysms are observed to be at a younger age when compared to other patients (3). Multiple aneurysms were observed in the subclavian, axillary, brachial, intercostal, lumbar, main iliac, and internal iliac arteries in our patient. There were no signs of thrombus or obstruction in the coronary artery or systemic arterial aneurysms. In order to prevent potential complications, aspirin, clopidogrel, and enoxaparin treatments were initiated.

Long-term management of patients with giant coronary and systemic arterial aneurysms is critical due to the ongoing risks of thrombosis, stenosis, and myocardial ischemia. In such cases, combination antithrombotic therapy, typically low-dose aspirin and/or clopidogrel alongside warfarin or low-molecular-weight heparin, is recommended. Regular imaging with echocardiography and computed tomography or magnetic resonance angiography is essential to monitor aneurysmal changes (10). An individualized treatment approach and coordinated multidisciplinary follow-up are vital in order to reducing life-threatening complications and optimizing long-term outcomes.

Early diagnosis and treatment of KD are crucial in order to prevent the development of coronary and systemic arterial aneurysms. This case was presented to highlight the occurrence of systemic arterial aneurysms in patients diagnosed with KD at an early age and found to have giant coronary artery aneurysms, as well as to emphasize the importance of recognizing atypical presentations.

Ethics

Informed Consent: A written informed consent form was received from the patient's family giving permission for the publication of this case.

Footnotes

Authorship Contributions

Surgical and Medical Practices: M.B.B., E.D., F.E., G.K.K., Ş.Ş.Ö., M.Y., B.B.A., B.K.B., Z.Ü.T., Concept: E.D., Z.Ü.T., Design: E.D., Z.Ü.T., Data Collection or Processing: M.B.B., F.E., G.K.K., Ş.Ş.Ö., S.B., Analysis or Interpretation: M.B.B., E.D., Z.Ü.T., Literature Search: M.B.B., M.Y., B.B.A., B.K.B., Writing: M.M.B., Z.Ü.T.

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