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Pediatric Case of Incomplete Kawasaki Disease: Diagnostic Insights

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ABSTRACT

A 9-year-old female, first-born of a third-degree consanguineous marriage, from an upper-middle socioeconomic background, with unremarkable family, antenatal, and birth history, fully immunized and developmentally normal, presented with fever and generalized body ache for one month, accompanied by vomiting for three days. On admission, she was febrile and tachycardic. Examination revealed a strawberry tongue and cervical lymphadenopathy, while systemic examination was otherwise unremarkable. Laboratory investigations showed neutrophilia, elevated C-reactive protein, ESR, and LDH. A 2D echocardiogram demonstrated dilation of the left main coronary artery (LMCA) ostia (3–4 mm), consistent with incomplete Kawasaki disease. The patient received intravenous immunoglobulin (IVIG) at 2 g/kg over 48 hours, followed by prednisolone 1 mg/kg and aspirin 5 mg/kg. One unit of packed red blood cells (PRBC) was transfused. The child remained hemodynamically stable, showed clinical improvement, and had no further complaints during hospitalization. She was subsequently planned for discharge.

Keywords: Kawasaki, Immunized, Tachycardia, Prednisolone, Thermodynamically.

INTRODUCTION

Kawasaki disease (KD) is an acute systemic vasculitis predominantly affecting medium- and small-sized blood vessels [1]. It typically presents as an acute febrile illness, most commonly in children between 6 months and 5 years of age [2]. Without timely treatment, KD can lead to coronary artery complications in over 20% of patients, making it the leading cause of acquired heart disease in high-income countries [2]. The first case of KD was identified by Dr. Tomisaku Kawasaki in January 1961 [2], when a 4-year-old boy presented with a high-grade fever for two weeks, bilateral conjunctival injection, fissured and bleeding lips, a strawberry tongue, and diffuse erythema of the oral cavity and mucous membranes [3]. KD occurs worldwide across all ethnicities. Its prevalence is notably higher in Asian countries such as Japan, where the annual incidence increased from 239.6 per 100,000 children in 2010 [4] to 264 per 100,000 children in recent years [5]. Seasonal variations have been observed, with incidence peaking in January and June–July, and lowest in October [6,7].

CASE REPORTS

A 9-year-old female child, the second-born of a non-consanguineous marriage, presented to the Pediatric Department at Karnataka Institute of Medical Sciences (KIMS), Hubballi, with a prolonged history of fever and systemic symptoms. She was from an upper-middle socioeconomic background, with no significant antenatal, birth, or family history, and was fully immunized and developmentally appropriate for her age.

CHIEF COMPLAINTS

The child had been experiencing persistent, intermittent high-grade fever for one month, accompanied by mild chills and diffuses body aches, leading to progressive fatigue and malaise.

HISTORY OF PRESENTING ILLNESS

the child was reportedly healthy until one month prior, when she developed intermittent high-grade fever accompanied by chills. Over the ensuing weeks, she experienced generalized body aches, fatigue, and malaise. On clinical examination, notable features

included a strawberry tongue, erythema and fissuring of the lips, and cervical lymphadenopathy. Systemic examination was otherwise unremarkable. Laboratory investigations revealed elevated inflammatory markers, including C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), and neutrophilia. A 2D echocardiogram demonstrated dilation of the left main coronary artery ostium, supporting a diagnosis of **incomplete Kawasaki disease**.

FAMILY HISTORY:

The detailed family history did not reveal any hereditary, autoimmune, or cardiovascular disorders that could predispose the child to vasculitic illness. There was no history of recent similar febrile illness among siblings or close household contacts. The parents reported no prior episodes suggestive of Kawasaki disease in the family. A schematic representation of the familial and clinical relationships among the various components of the case is depicted in **Figure 1.**

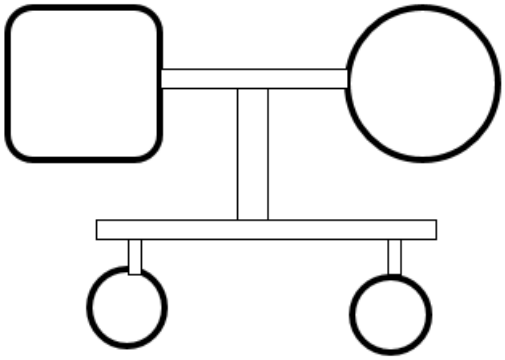

Figure 1: Schematic representation indicating the relationship between different components in the case.

Family History: There is no history of similar complaints, autoimmune disorders, or chronic illnesses among family members. No family history of cardiac, hematologic, or systemic inflammatory disorders was reported.

Immunization History: The child is fully immunized according to the national immunization schedule. She received all routine vaccines on time, including the DPT booster (DPT-B2) at 5 years, with no adverse reactions noted.

Developmental History: The child demonstrates age-appropriate physical, cognitive, and social development. She is currently enrolled in the 3rd standard and has good scholastic performance. Her motor and language milestones were achieved on time.

Birth History: She was born at term via uncomplicated full-term vaginal delivery (FTVD), with a birth weight of 2.5 kg. She cried immediately after birth, had an Apgar score within normal limits, and did not require neonatal intensive care. No perinatal complications were reported.

Antenatal History: The pregnancy was uneventful, with regular antenatal check-ups and no complications in the first, second, or third trimesters. Maternal investigations during pregnancy, including routine blood tests and ultrasonography, were normal, and there was no history of maternal infections or medications that could affect fetal development.

SYSTEMIC EXAMINATION:

Abdomen: The umbilicus was central, and all quadrants moved symmetrically with respiration. The abdomen was soft, non-tender, and no organomegaly was palpable.

Respiratory System: Chest movements were symmetrical. Air entry was slightly reduced on the left side. Percussion revealed resonant lung fields bilaterally. Auscultation revealed normal vesicular breath sounds with no added sounds.

Cardiovascular System: The precordium appeared normal. The apex beat was located at the 5th intercostal space, medial to the midclavicular line. Heart sounds S1 and S2 were normal, with no murmurs or additional sounds detected.

Central Nervous System: The cranial nerves were intact. Motor examination revealed power of 4/5 in all four limbs with normal tone and bulk. Sensory examination was normal. Plantar reflexes were normal bilaterally, and there were no signs of meningeal irritation or cerebellar dysfunction.

Clinical Features Suggestive of Kawasaki Disease: On further assessment, the child exhibited a strawberry tongue, erythema of the oral mucosa, and cervical lymphadenopathy. Laboratory investigations revealed elevated inflammatory markers, including neutrophilia, C-reactive protein, and erythrocyte sedimentation rate. A 2D echocardiogram demonstrated dilation of the left main coronary artery ostium, supporting a diagnosis of **incomplete Kawasaki disease**.

DIAGNOSIS:

Investigations:

2D Echocardiography: The left main coronary artery (LMCA) ostium was dilated, measuring 3–4 mm, consistent with coronary involvement in Kawasaki disease. The right coronary artery (RCA) was normal. Cardiac situs was normal, with structurally intact valves and chambers. No evidence of pulmonary artery hypertension (PAH) was observed, and biventricular function was preserved.

Ultrasonography – Ejection Fraction (EF): 60%, indicating normal left ventricular systolic function.

Peripheral Blood Smear: Red blood cells were microcytic and hypochromic, suggestive of mild anemia. White blood cell count was normal, with relative neutrophilia and toxic granulations noted in neutrophils, reflecting an active inflammatory process. Platelet counts were adequate, and no parasites were observed. **Impression:** Microcytic hypochromic anemia with relative neutrophilia, likely secondary to systemic inflammation.

Erythrocyte Sedimentation Rate (ESR): 70 mm in the first hour, supporting a diagnosis of ongoing systemic inflammation consistent with Kawasaki disease.

These findings, particularly the coronary artery dilation in the context of prolonged fever, mucocutaneous changes, and elevated inflammatory markers, support a diagnosis of **incomplete Kawasaki disease** in this patient.

HEAD TO TOE EXAMINATION

Table 1: General and Systemic Examination Findings of the Patient

System / Part Examined	Findings	Interpretation / Relevance to Case (Incomplete Kawasaki Disease)
Hair	Normal	No dermatological or nutritional abnormality observed.
Eyes	Normal	Absence of conjunctival congestion or erythema — a feature sometimes missing in incomplete cases.
Oral Cavity	Strawberry tongue	Suggestive of mucocutaneous involvement typical of Kawasaki disease.
Neck	Cervical lymphadenopathy (upper cervical, 1.5 cm)	Supports diagnostic criteria; one of the principal features of Kawasaki disease.
Chest	Normal	No respiratory distress; lungs clear on auscultation.
Upper Limb	Normal	No edema, erythema, or desquamation noted — findings may be absent in incomplete forms.
Lower Limb	Normal	No peripheral edema or rash; helps in differentiating incomplete presentation.

On systemic examination, the child showed largely normal findings except for **strawberry tongue and cervical lymphadenopathy**, which are key supportive features of Kawasaki disease. The absence of conjunctival congestion, extremity edema, rash, or desquamation highlights the **incomplete nature of the presentation**, where classic signs may be partially or entirely missing. Normal chest and limb findings helped exclude respiratory or other infectious causes of prolonged fever, while the presence of mucocutaneous involvement and lymph node enlargement provided crucial diagnostic clues toward **incomplete Kawasaki disease** despite the atypical clinical picture.

Table 2: Anthropometric Measurements of the Patient

Parameter	Observed Value (O)	Expected/Reference Value (E)	Interpretation (I)
Height for Age	136 cm	131.4 cm	Within 50th–90th percentile — normal growth.
Weight for Age	32.05 kg	23.5 kg	Within 50th–90th percentile — adequate weight for age.
Body Mass Index (BMI)	17.3	15.8	15.8–23rd percentile — normal nutritional status.
	O	E	I

The child's anthropometric parameters indicate **normal growth and nutritional status for age**. Height (136 cm) and weight (32.05 kg) are within the **50th–90th percentiles**, reflecting appropriate physical development. The BMI of **17.3** also falls within the normal reference range, suggesting **adequate nutritional status** with no evidence of under nutrition or obesity at the time of presentation.

Table 3: Vital Signs and General Examination Findings

Parameter	Observed Value	Interpretation / Remarks
Temperature	103°F	High-grade fever — consistent with febrile phase of Kawasaki disease.
Pulse Rate	132 beats/min	Tachycardia, likely secondary to fever.
Respiratory Rate	20 breaths/min	Within normal limits for age.
Blood Pressure	120/60 mmHg	Within normal range.
Peripheral Temperature	Warm	Indicates adequate perfusion; no evidence of shock.
Heart Rate	130 bpm	Correlates with tachycardia due to fever.
SpO_2	93%	Mild desaturation; warrants monitoring for cardiac involvement.

The vital signs revealed a **high-grade fever (103°F)** with associated **tachycardia (pulse 132/min, heart rate 130 bpm)**, consistent with the acute febrile and inflammatory phase of Kawasaki disease. **Respiratory rate (20/min) and blood pressure (120/60 mmHg)** remained within normal limits, indicating stable cardiorespiratory status. **Warm peripheral temperature** suggested adequate tissue perfusion with no evidence of shock. However, **SpO_2 of 93%** indicated mild desaturation, warranting careful monitoring for possible **cardiac involvement**, which is a known complication of Kawasaki disease.

LAB INVESTIGATIONS

Table 4: Laboratory Investigation Findings

Parameter	Observed Value	Normal Reference Range	Interpretation / Remarks
Urea	17 mg/dL	10–45 mg/dL	Within normal limits.
Creatinine	0.5 mg/dL	0.4–1.0 mg/dL	Normal renal function.
Sodium	132 mmol/L	135–145 mmol/L	Mild hyponatremia — may occur in inflammatory states.
Potassium	4.6 mmol/L	3.5–5.0 mmol/L	Normal.
LDH	792 U/L	140–280 U/L	Elevated — indicates tissue inflammation or injury.
Total Protein	6.0 g/dL	6.0–8.0 g/dL	Lower normal limit.
Albumin	2.9 g/dL	3.5–5.0 g/dL	Hypoalbuminemia — supports inflammatory process.
Total Bilirubin	0.2 mg/dL	0.2–1.2 mg/dL	Normal.
Direct Bilirubin	0.1 mg/dL	0.0–0.3 mg/dL	Normal.
C-Reactive Protein (CRP)	30.6 mg/dL	<5 mg/dL	Markedly elevated — indicates significant inflammation.
AST (SGOT)	15 U/L	10–40 U/L	Normal.
ALT (SGPT)	28 U/L	10–45 U/L	Normal.
Alkaline Phosphatase	130 U/L	44–147 U/L	Within normal limits.

Hemoglobin (Hb)	7.2 g/dL	11.5–15.5 g/dL	Anemia present — common in Kawasaki disease.
Differential Leukocyte Count (Neutrophils)	85% N	40–75% N	Neutrophilia — supports active inflammation.

In this case of **incomplete Kawasaki disease**, the laboratory findings strongly support an **acute systemic inflammatory process**. Markedly elevated **CRP and LDH**, along with **neutrophilia**, indicate active inflammation typical of the acute phase of the disease. **Hypoalbuminemia and mild hyponatremia** further reflect the severity of the inflammatory response. The presence of **significant anemia** is a known hematological association in Kawasaki disease. Normal renal and hepatic parameters helped rule out primary renal or hepatic pathology, thereby strengthening the diagnosis of **incomplete Kawasaki disease based on supportive laboratory evidence**.

TREATMENT

Table 5: Therapeutic Management and Interpretation in Incomplete Kawasaki Disease

Treatment / Medication	Dosage & Frequency	Route / Duration	Purpose / Mechanism	Interpretation / Relevance to Case
Intravenous Immunoglobulin (IVIG)	33 ml/hr up to 4th day	Intravenous (IV) infusion	Provides passive antibodies that reduce inflammation and modulate immune response	**First-line therapy** to reduce vascular inflammation and **prevent coronary artery aneurysm**; initiation within first 10 days is crucial. Live vaccines (e.g., MMR, Varicella) should be **delayed for 11 months** post-IVIG.
Tablet Aspirin	5 mg/kg × 3 tablets (6 AM, 12 PM, 6 PM) for 2 days	Oral	Anti-inflammatory and antiplatelet effects; reduces fever, joint pain, and inflammation	**High-dose Aspirin** helps control fever and inflammation during the acute phase. Discontinued once the fever subsides to minimize toxicity risk.
Tablet Paracetamol (Acetaminophen)	500 mg SOS	Oral	Analgesic and antipyretic	Used **as supportive therapy** to manage fever or discomfort; given when needed.
Injection Piperacillin–Tazobactam	100 mg/kg/dose	Intravenous	Broad-spectrum antibiotic effective against gram-positive and gram-negative bacteria	Given **to prevent or manage secondary bacterial infection**, especially in hospitalized patients with prolonged fever.
Tablet Prednisolone	2 mg/kg/dose OD	Oral	Corticosteroid; anti-inflammatory and immunosuppressive	Added when response to IVIG is incomplete or **persistent inflammation** occurs, helps reduce vascular damage and fever.
Injection Emeset (Ondansetron)	1 cc SOS	Intravenous / IM	Antiemetic; prevents nausea and vomiting	Given **as symptomatic relief** for nausea/vomiting possibly due to IV medications or systemic illness.
Injection Ranitidine	1 cc SOS	Intravenous / IM	H2 receptor antagonist; reduces gastric acid secretion	Used **to prevent gastritis or gastric irritation**, especially when on steroids or Aspirin.

Normally the treatment of Kawasaki disease often happens in a hospital ,the goals of treatment are to lower fever, reduce swelling and prevent heart damage and the treatment started with intravenous immunoglobulin with the frequency of 33 ml/hr up to 4th day for to lowers inflammation in blood vessels and it lowers the risk of problems with the heart artery[after getting immunoglobulin, wait at least 11 months to get a live vaccine, such as the chickenpox or measles vaccine [6]],the tablet Aspirin 5 mg/kg 3 tablet with the frequency of 6 am ,12 pm, 6 pm is given for 2 day this high dose may help to treat inflammation, also can decrease pain, joint swelling and fever and its stopped once the fever has been gone. Tablet paracetamol 500 mg is given as SOS. Injection Piperacillin Tazobactam with the dose 100mg/kg/dose, Tablet Prednisolone with the dose of 2 mg/kg/dose as OD and injection 1CC Emeset and Ranitidine is given as SOS.

DISCUSSION

Kawasaki disease is commonly a self-limiting vacuity although coronary artery aneurysms may occur in approximately 25-30% of untreated patients. According to standard therapy, 80-90% of treated patients show a clinical and biochemical remission; in the remaining percentage of patients a persistent fever represents a sign of unresponsiveness to IVIG which is the major risk factor for the development of coronary artery lesions [7]. The key to prevent this dangerous cardiac involvement is still unknown although the resolution of systemic inflammation as early as possible seems to represent the target of the therapy [8]. In this regard, in the absence of a standardized regime for resistant forms with a high risk of development of coronary artery anomalies, we suggest considering with IVIG even during an early phase of the disease if the score indexes are predictive.

CONCLUSION

This case highlights the diagnostic challenges and clinical significance of recognizing incomplete Kawasaki disease, particularly in older children presenting with prolonged fever and partial mucocutaneous manifestations. Early identification, supported by echocardiographic evidence of coronary involvement, and timely administration of intravenous immunoglobulin (IVIG) and corticosteroids were crucial in preventing long-term cardiac complications. The favorable clinical outcome emphasizes the importance of maintaining a high index of suspicion for incomplete forms of Kawasaki disease to ensure prompt management and improved prognosis.

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