Case Report

ANNALS OF DENTISTRY
UNIVERSITY OF MALAYA

www.adum.edu.my

Ann Dent UM 2026, 33: 32-37
DoI: 10.22452/adum.vol33.5

Dental Assessment of Severe Lip Crusting Leading to Diagnosis of Incomplete Kawasaki Disease: A Case Report

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KEYWORDS

Multidisciplinary care, oral mucositis, lip crusting, cardiovascular complication

ABSTRACT

Kawasaki Disease (KD) is an acute vasculitis of unknown etiology that predominantly affects children under five years old. It is classically characterized by prolonged fever, conjunctival injection, cervical lymphadenopathy, polymorphous rash, extremity changes, and oral mucosal involvement. While strawberry tongue and lip erythema are well-documented oral findings, severe lip crusting with blackish discoloration is an uncommon presentation. A 2-year-old child was referred to the pediatric dental clinic for severe lip crusting and mucositis. Initially treated for an upper respiratory tract infection, the child developed persistent fever, bilateral conjunctival injection, cervical lymphadenopathy, and reduced oral intake. The oral examination revealed extensive blackish crusting over the lips, which bled upon touch. This manifestation was initially suspected to be a reaction to topical medication, but clinical correlation suggested it was a rare but classic oral presentation of KD. The patient was admitted for systemic management, including intravenous immunoglobulin (IVIG) and supportive dental care. Daily oral toileting and mucosal hydration were initiated to manage lip crusting, along with the application of Gengigel®. The patient showed progressive improvement with systemic and local interventions. Early diagnosis and interdisciplinary collaboration are crucial in managing KD to ensure appropriate management and prevent complications such as coronary artery aneurysms.

INTRODUCTION

Kawasaki Disease (KD) is an acute idiopathic systemic vasculitis characterized by a self-limiting progression, primarily affecting children under five years of age, especially in East Asian nations [1]. It represents the most prominent cause of acquired coronary artery disease in childhood [2]. In the United States, 5.5 out of every 100,000 children are hospitalized annually due to KD [3]. The exact pathogenesis of KD remains unclear [4]. Children with KD often develop a fever that generally lasts for five days or more. KD is diagnosed as classical KD or complete KD (CKD) when a fever persists for five or more days, along with four of the following five criteria: bilateral conjunctival injection, oral manifestations including cracked and erythematous lips and strawberry tongue, cervical lymphadenopathy, extremity alterations such as erythema or desquamation of palms and soles, and a polymorphous rash [5, 6]. Incomplete (atypical) Kawasaki disease (IKD) is characterized by a fever lasting five or more days accompanied by only two or three of the principal clinical features. Because the disease may not present in its full form at the time of admission, early diagnosis can be challenging [6, 7].

Oral manifestations of KD include changes affecting the lips and oral cavity, which may present as erythema, dryness, fissuring, peeling, vertical cracking, and haemorrhage of the lips; a strawberry tongue characterized by erythema and prominent fungiform papillae; and generalized erythema of the oropharyngeal mucosa. [7]. However, severe haemorrhagic lip crusting is rarely reported and

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may be mistaken for a drug reaction or Stevens–Johnson syndrome [8, 9]. In these circumstances, dental clinicians can offer a vital diagnostic input by identifying mucosal alterations associated with IKD, facilitating earlier intervention and enhancing prognosis.

Although there is no specific diagnostic test for KD, laboratory and echocardiographic findings such as elevated C-reactive protein and erythrocyte sedimentation rate, hyponatremia, hypoalbuminemia, and coronary aneurysms may aid in assessing suspected cases and distinguishing KD from other conditions [1].

High-dose aspirin and intravenous immunoglobulin (IVIG) have long served as the cornerstone of treatment for KD [7]. The primary objective of therapy during the acute phase is to reduce inflammation and vascular injury while preventing thrombosis in patients with coronary artery abnormalities [1]. This involves the rapid suppression of the acute inflammatory response induced by KD.

Coronary artery aneurysms (CAAs) represent the most significant complication of Kawasaki disease, contributing substantially to morbidity and mortality [10]. All individuals who fulfill the American Heart Academic (AHA) diagnostic criteria for KD should get treatment as soon as the diagnosis is confirmed. The pathogenic process of necrotizing arteritis during acute condition leads to the destruction and weakening of the artery wall, resulting in aneurysms, and may be accompanied by subacute or chronic inflammation and luminal myofibroblastic proliferation [11]. These processes can result in both acute (often triggered by thrombus or arrhythmia) and chronic (mostly induced by occlusions or stenoses) cardiovascular morbidity and events [11]. Therefore, early detection of KD is crucial for reducing complications associated with this condition. Any child exhibiting an inexplicable fever should be meticulously observed, and doctors must remain highly vigilant for the potential of KD. Transthoracic echocardiography is the imaging modality of choice for detecting coronary artery aneurysms and other cardiac abnormalities in KD, and it should be performed promptly when clinical features suggest the diagnosis. [7, 11].

Apart from that, lip fissuring and crusting are recognised features of KD, but the progression to severe haemorrhagic crusting is not often described in detail within existing case reports. Most publications reference oral changes broadly without illustrating their clinical evolution or relevance to early diagnostic reasoning. This case adds to the limited literature by providing a focused description of these mucosal findings and emphasising how dental assessment contributed to the recognition of IKD. Highlighting the dental perspective underscores the value of interdisciplinary evaluation when oral signs may precede or support systemic diagnostic criteria.

CASE REPORT

A two-year-old child was referred to the paediatric dental clinic from the paediatric ward due to rapidly worsening, painful lip crusting associated with bleeding. The child presented initially with a five-day history of high-grade fever (39.3 °C), irritability, and a progressively enlarging swelling over the left postauricular region. There was no prior medical illness, no history of drug allergy, and no significant family or psychosocial history. The caregiver reported applying triamcinolone acetonide topical gel that was prescribed by a private general medical clinic to the child's lips for two days prior to referral.

On examination, the child's general condition appeared lethargic and febrile. Extraoral examination revealed bilateral conjunctival injection without discharge (Figure 1) and a warm, tender unilateral cervical lymph node (Figure 2). The cervical area exhibited a purple discoloration due to the application of indigo dye (locally known as "nila") by the patient's mother (Figure 2). No rashes, palmar changes, or skin desquamation were observed. Intraoral examination showed striking thick haemorrhagic crusts coating both upper and lower lips (Figure 3), which bled upon minimal contact. The gingiva, tongue, and remaining oral mucosa appeared intact with no ulceration or vesiculation. The severity, colour, and bleeding pattern of the crusting were inconsistent with a topical corticosteroid gel reaction and instead suggested a systemic inflammatory process.



Figure 1 Bilateral conjunctival injection

At this stage, the severe fissuring and haemorrhagic crusting of the lips raised clinical concern but were interpreted with caution, as these findings are not specific to KD and may also result from dehydration, mouth breathing, or other mucosal

inflammatory conditions. Although dry, cracked, and erythematous lips are recognised mucocutaneous features of KD, the presence of crusting was considered part of a possible spectrum of mucosal changes rather than an isolated rare manifestation. Therefore, the dental and paediatric teams evaluated the oral findings within the broader clinical context. The child exhibited persistent high-grade fever, bilateral conjunctival injection, and unilateral cervical lymphadenopathy, together with markedly elevated inflammatory markers, supporting a systemic inflammatory process. While other classical oral features such as diffuse oropharyngeal erythema or a strawberry tongue were not observed, the overall constellation of mucosal involvement, systemic signs, and early coronary artery changes on echocardiography strengthened suspicion for IKD. The lip fissuring and crusting were thus interpreted as accompanying mucocutaneous features contributing to, but not solely determining, the clinical diagnosis. This integrated assessment justified early cardiology evaluation and timely initiation of IVIG therapy.



Figure 2 Tender unilateral cervical lymph node



Figure 3 Haemorrhagic crusts coating both upper and lower lips

Laboratory investigations (Table 1) demonstrated elevated inflammatory markers including raised CRP (24.12mg/dL) and ESR (120mm/hr), anaemia (84g/L), and hyponatraemia (134mmol/L), which supported a systemic inflammatory process rather than a localized drug reaction. On day three of admission, transthoracic echocardiography revealed mild proximal right coronary artery dilatation, further reinforcing the likelihood of KD. Differential diagnoses considered included drug-induced mucositis, Stevens–Johnson syndrome, viral mucositis such as HSV, and IKD. Ultimately, the combination of persistent fever, mucosal involvement, cervical lymphadenopathy, elevated inflammatory markers, and early coronary changes confirmed the diagnosis of IKD.

Table 1 Baseline blood test result

Parameter	Patient's value	Normal range	Interpretation
CRP (C-Reactive Protein)	24.12mg/L	<0.5mg/L	Elevated – indicates acute inflammation
ESR	120mm/h	<21mm/h	Highly elevated
Hb (Hemoglobin)	84g/L	110-140g/L (Children)	Mild anemia
MCV	77fL	75-87fL	Microcytic
Sodium (Na^+)	134mmol/L	139-146mmol/L	Mild hyponatremia
Albumin	38g/L	23-35g/L	Normal
Globulin	36g/L	19-35g/L	Slightly elevated
WBC (White Blood Cell)	$11.1x10^9$/L	5.0-$15.0x1x10^9$/L	Normal
Platelet count	$363x10^9$/L	200-$4901x10^9$/L	Normal (could rise later)

Systemic management by paediatric team consisted of IVIG administered at 2 g/kg over 12 hours, followed by initiation of high-dose aspirin once the diagnosis was established, with ongoing monitoring for potential cardiac complications. Dental management focused on daily oral toileting with normal saline to soften haemorrhagic crusts and reduce bleeding, supplemented with the application of Gengigel® to promote mucosal hydration and healing. All topical corticosteroid gels were discontinued, and caregivers were educated on gentle cleansing techniques and maintaining adequate oral hydration. Within 24 hours of combined systemic and dental interventions, the lip crusts softened considerably, bleeding reduced, and the child's oral intake improved.

At the one-week review, there was marked improvement in mucositis with minimal, non-

bleeding crusting observed. At the two-week review, the lip and oral lesions had completely resolved, and a repeat echocardiogram demonstrated normal coronary arteries. No complications arose during treatment or follow-up, and the child successfully resumed normal feeding and daily activities.

The caregiver reported significant relief upon understanding the cause of the child's symptoms, expressing that the severe lip crusting had been distressing and had substantially affected feeding and comfort prior to treatment. Written informed consent for publication, including the use of clinical photographs, was obtained from the child's parent.

DISCUSSION

This case report underscores the importance of interdisciplinary coordination between pediatricians and paediatric dentist to ensure safe and effective care in managing KD patients. The diagnosis of IKD remains challenging when only two or three of the principal clinical criteria are present, as occurred in this child such as fever, conjunctivitis, and lymphadenopathy. AHA Guideline emphasize that incomplete presentations warrant consideration of KD in any child with more than five days of fever, elevated inflammatory markers, and echocardiographic findings or supplemental laboratory evidence such as hypoalbuminaemia, anaemia, thrombocytosis, hyponatraemia [6, 7]. IKD is associated with higher risk of delayed treatment and coronary artery sequelae. According to Li Ti Feng *et al*. [6], timely initiation of IVIG preferably within ten days of fever onset is pivotal to reducing coronary artery complications. Therefore, early diagnosis is crucial.

The oral mucocutaneous manifestations of KD warrant particular attention as they often provide early and clinically meaningful diagnostic cues. Although the typical findings include a strawberry tongue and diffuse mucositis, reports describing black hemorrhagic crusting of the lips are scarce in literature. Noval Rivas and Arditi (2023) noted in their review that oral manifestations in systemic inflammatory syndromes overlapping with KD include lip fissuring, cheilitis, and tongue changes, but hemorrhagic crusting was not emphasized [12]. In KD, inflammation of the oral mucosa leads to erythema, oedema, and increased vascular permeability, resulting in the characteristic dry, cracked, and fissured lips. When the inflamed mucosa becomes severely desiccated often exacerbated by fever, reduced oral intake, or mouth breathing fissures may bleed and subsequently form haemorrhagic crusts. Thus, lip crusting in KD represents a continuum of mucosal dryness, inflammation, and epithelial breakdown, rather than an isolated or atypical feature. Importantly, these lip changes often occur alongside other recognised mucocutaneous signs, including diffuse oropharyngeal erythema, a strawberry tongue, or generalized mucosal erythema, all of which reflect the underlying vasculitis process [1,5].

Given the rarity of such severe manifestations, dental practitioners should remain vigilant for mucosal changes that extend beyond the typical presentation of cracked lips. A high index of suspicion for KD is warranted in children presenting with unexplained, severe lip or mucosal lesions accompanied by fever and lymphadenopathy, even when other classic features of the disease are absent. In this case, the paediatric dental team recognized the diagnosis of KD. This finding prompted early echocardiography and timely administration of IVIG, which, when given within ten days of fever onset, has been shown to significantly reduce the incidence of coronary artery aneurysms [13].

Supportive dental measures played a significant role in promoting healing of the lips and improving the child's comfort during the acute phase of KD. In KD, mucosal inflammation and desiccation can lead to fissuring, bleeding, and crust formation, which are often exacerbated by fever, reduced oral intake, and mouth breathing. The use of daily oral toileting with normal saline helped to gently soften and remove haemorrhagic crusts while maintaining surface hydration, thereby reducing mechanical irritation and facilitating epithelial repair. The application of a bioadhesive mucosal gel (Gengigel®) provided a protective moisture barrier, enhanced lubrication, and supported tissue regeneration by reducing frictional trauma during speaking and feeding. Caregiver counselling on adequate systemic hydration, gentle lip care, and avoidance of irritants such as topical corticosteroids further minimized mucosal dryness and prevented worsening of fissures. In combination, these measures reduced bleeding, improved oral comfort, and supported gradual return to normal oral intake. Although systemic therapy with IVIG and aspirin addressed the underlying vasculitic process, these targeted dental interventions were essential in managing the local mucosal sequelae of KD, thereby contributing significantly to the child's overall recovery [8].

In summary, timely hospital admission and prompt initiation of treatment are crucial for patients with KD. Early recognition of atypical clinical manifestations, such as unexplained severe lip or mucosal lesions, is essential to ensure effective management and improve patient outcomes.

CONCUSION

In conclusion, severe hemorrhagic lip crusting and oral mucositis may represent a significant but under-recognized manifestation of IKD. When classic features are absent or partial, detailed oral examination by the dental team can be a pivotal diagnostic link. Early diagnosis and interdisciplinary collaboration are crucial to ensure appropriate management and prevent complications such as coronary artery aneurysms.

ACKNOWLEDGEMENT

The authors would like to express their sincere appreciation to whoever involved in managing this case. This case report was supported by the IIUM Chain Grant (CHAIN 25-012-0012).

DECLARATION OF INTEREST

Authors declare no conflict of interest.

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Editorial History
Date of Submission: 8 Nov 2025
Review & Revision: 27 Nov 2025 – 2 May 2026
Accepted: 31 Aug 2026
Published: 22 Oct 2026

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