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Kawasaki disease in a 7-year-old boy mimicking a peritonsillar abscess

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Aim – to analyze a clinical case of incomplete Kawasaki disease (KD) with atypical manifestations and to highlight the importance of early recognition in pediatric patients presenting with persistent fever unresponsive to antimicrobial therapy.

Clinical case. This report describes an atypical presentation of KD in a 7-year-old child manifesting as a presumed peritonsillar abscess, representing a rare otorhinolaryngological phenotype that significantly complicated the diagnostic process. A previously healthy boy was admitted with a 4-day history of high-grade fever, odynophagia, and painful cervical lymphadenopathy. Initial clinical assessment suggested a peritonsillar abscess; however, needle aspiration yielded no purulent discharge. Empirical antibiotic therapy failed to achieve clinical improvement. Magnetic resonance imaging excluded abscess formation and demonstrated inflammatory changes consistent with tonsillitis and cervical lymphadenopathy. By day 7 of illness, progressive thrombocytosis and bilateral non-exudative conjunctival injection were observed. Based on the constellation of clinical features (prolonged fever, mucocutaneous involvement, lymphadenopathy) and laboratory findings (elevated inflammatory markers, anemia, thrombocytosis), a diagnosis of incomplete KD was established in accordance with the American Heart Association guidelines. Treatment of intravenous immunoglobulin (IVIG) in combination with acetylsalicylic acid resulted in rapid defervescence and marked clinical improvement. Serial echocardiographic evaluations revealed no coronary artery abnormalities.

Conclusions. KD should be considered in the differential diagnosis of pediatric patients with fever lasting more than 5 days and presumed bacterial infections refractory to antibiotic therapy. Early recognition and timely initiation of IVIG therapy are critical for reducing the risk of coronary artery complications. Heightened awareness among clinicians, particularly in otorhinolaryngology and emergency settings, is essential.

The study was conducted in accordance with the principles of the Declaration of Helsinki. Informed consent was obtained from the children's parents. The authors declare no conflict of interest.

Keywords: Kawasaki disease, coronary artery aneurysms, peritonsillar abscess, acetylsalicylic acid, intravenous immunoglobulin, children, echocardiography, vasculitis, fever.

Хвороба Кавасакі, що імітує перитонзиллярний абсцес, у 7-річного хлопчика Ю.С. Степановський^{1,2}, Ю.І. Климишин³, Н.О. Цимбаленко², Л.Ю. Костенко², Р.Г. Наливайко², Т.О. Сябро²

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Мета – проаналізувати клінічний випадок неповної форми хвороби Кавасакі з атипovими проявами та підкреслити значення ранньої діагностики в дітей із тривалою гарячкою, резистентною до антибактеріальної терапії.

Представлено **клінічний випадок** атипovого перебігу хвороби Кавасакі у 7-річної дитини, що маніфестував клінічною картиною, подібною до паратонзиллярного абсцесу, що є рідкісним клінічним варіантом і суттєво ускладнює діагностику. Хлопчика було госпіталізовано із гарячкою протягом 4-х днів, болем при ковтанні та болісною шийною лімфаденопатією. Первинно встановлено діагноз паратонзиллярного абсцесу, однак пункція не виявила гнійного вмісту. Емпірична антибактеріальна терапія була неефективною. За результатами магнітно-резонансної томографії абсцес не підтверджено, виявлено ознаки тонзиліту та лімфаденопатії. На 7-й день захворювання спостерігалися зростання кількості тромбоцитів і двобічна негнійна ін'єкція кон'юнктив. На підставі клінічних даних (гарячка понад 5 днів, зміни на слизовій оболонці ротової порожнини, лімфаденопатія) та лабораторних даних (підвищені маркери запалення, анемія, тромбоцитоз) встановлено діагноз неповної форми хвороби Кавасакі відповідно до рекомендацій Американської кардіологічної асоціації. Проведення терапії внутрішньовенним імуноглобуліном у поєднанні з ацетилсаліциловою кислотою забезпечило швидке клінічне покращення. Згідно з даними серії ехокардіографічних обстежень, ураження коронарних артерій не виявлено.

Висновки. Хвороба Кавасакі повинна розглядатися у диференційній діагностиці в дітей із гарячкою понад 5 днів, зокрема під час первинної діагностики бактеріальної інфекції, резистентної до антибіотикотерапії. Рання діагностика та своєчасне введення внутрішньовенного імуноглобуліну є критично важливими для профілактики коронарних ускладнень. Підвищення настороженості лікарів різних спеціальностей має ключове значення для своєчасного встановлення діагнозу.

Дослідження виконано відповідно до принципів Гельсінської декларації. На проведення досліджень отримано інформовану згоду батьків дитини.

Автори заявляють про відсутність конфлікту інтересів.

Ключові слова: хвороба Кавасакі, аневризми коронарних артерій, паратонзиллярний абсцес, ацетилсаліцилова кислота, внутрішньовенний імуноглобулін, діти, ехокардіографія, васкуліт, гарячка.

Introduction

Kawasaki disease (KD) is an acute vasculitis that predominantly affects children under five years of age. It is characterized by fever, inflammatory changes of the lips and oral mucosa, cervical lymphadenopathy, extremity changes such as swelling of the hands and feet with subsequent desquamation, and polymorphous skin rashes. As an acute inflammatory disorder, KD may present with a wide spectrum of other manifestations that can mimic a variety of conditions, including infections, allergic diseases, surgical pathologies, or disorders of the central nervous system [2]. On rare occasions, KD may manifest with symptoms resembling acute otorhinolaryngological pathology, such as a peritonsillar abscess, which significantly complicates the diagnostic process and delays appropriate treatment [8]. This report describes the clinical course, diagnostic challenges, and management of a 7-year-old patient with KD that initially presented as a peritonsillar abscess.

Aim – to analyze a clinical case of KD with atypical manifestations in a 7-year-old boy and to raise awareness of this condition among healthcare professionals.

Collection of medical history, analysis of physical, laboratory, and instrumental examination findings.

The diagnosis of KD was established in accordance with the 2017 American Heart Association guidelines [7]. In addition, a literature search was conducted to identify and analyze previously reported similar cases.

The research was carried out in accordance with the principles of the Declaration of Helsinki. The informed consent of the patients was obtained for conducting the studies.

Clinical case

A 7-year-old boy was admitted to the Kyiv City Children’s Clinical Hospital No. 1 on the 4th day of persistent high fever, presenting with sore throat, general weakness, and enlarged tender cervical lymph nodes. Physical examination revealed swelling in the right submandibular region with tenderness on palpation. Oropharyngoscopy demonstrated oropharyngeal asymmetry due to rotation of the right posterior palatal arch, which appeared hyperemic and edematous. The boy was hospitalized in the Ear, Nose, and Throat (ENT) department with a presumptive diagnosis of right posterior palatal arch abscess. Laboratory evaluation showed elevated inflammatory markers, including C-reactive protein (CRP) at 48 mg/L and erythrocyte sedimentation rate (ESR) at 32 mm/h. The laboratory findings are summarized in Table 1.

Table 1

Laboratory parameters of the patient

Complete blood count	Day of illness								
	4 th	6 th	7 th	8 th	9 th	10 th	11 th	12 th	14 th
Red blood cells, $\times 10^{12}/L$	4.32	4.54	4.18	4.3	4.03	4.59	4.02	4.05	3.76
Hemoglobin, g/L	115	121	110	115	110	121	106	106	98
Platelets, $\times 10^9/L$	308	493	648	621	717	797	869	1024	1106
White blood cells, $\times 10^9/L$	15.1	22.2	17.7	21.6	22.6	22.9	11.3	11.5	9.4
Band neutrophils, %	5	2	5	9	6	3	2	3	2
Segmented neutrophils, %	83	86	73	74	57	80	54	59	63
Eosinophils, %	0	0	1	0	7	1	6	4	3
Basophils, %	0	0	0	0	0	0	1	0	0
Monocytes, %	9	6	9	7	3	6	13	8	11
Lymphocytes, %	3	6	9	9	23	10	23	26	21
Erythrocyte sedimentation rate, mm/h	32	40	38	50	-	46	65	65	59
Selected biochemical parameters									
C-reactive protein, mg/L	48	96	-	-	24	-	24	12	10
Procalcitonin, ng/mL	-	-	0.12	-	-	-	-	-	-
Urinalysis									
Leukocytes, per high-power field	-	0–1–2	-	-	-	-	-	-	-
Bacteria	-	absent	-	-	-	-	-	-	-

A puncture of the swollen area was performed, but no purulent content was obtained. Cefotaxime was initiated empirically according to the preliminary diagnosis.

On the 3rd day of hospitalization, the above-mentioned clinical symptoms persisted. Magnetic resonance imaging (MRI) of the soft tissues of the neck was performed, revealing signs of right-sided tonsillitis and cervical lymphadenopathy, without evidence of abscess formation (Figure 1).

Due to the lack of response to empirical Cefotaxime therapy during the first three days of hospitalization – manifested by persistent daily high fever, lethargy, markedly reduced appetite, painful cervical lymphadenopathy, and sustained elevation of inflammatory markers on laboratory testing (Table 1) – the patient was switched to treatment with Ceftazidime and Azithromycin (the latter was replaced with Clindamycin after three days). Tests for influenza, COVID-19, and acute Epstein-Barr virus (EBV) and cytomegalovirus (CMV) infections were negative. Throat swab culture revealed non-group A hemolytic streptococcus, *Streptococcus viridans*, and *Staphylococcus aureus*. Fungal culture was negative.

On the 7th day of illness, the department physicians noted an increase in platelet count and, subsequently, the appearance of bilateral conjunctival injection (Figure 2), without purulent ocular discharge.

KD was suspected, which allowed a reassessment of the clinical course, laboratory, and instrumental findings. Based on the combination of clinical manifestations (fever lasting more than 5 days, bilateral non-purulent conjunctivitis, «strawberry» tongue, cervical lymphadenitis, and dry lips) and laboratory results (CRP – 96 mg/L, anemia – hemoglobin 98 g/L, leukocytosis – $>15 \times 10^9/L$, platelet count – $>450 \times 10^9/L$ after the 7th day of illness), a diagnosis of incomplete KD was established.

On the same day, treatment with intravenous immunoglobulin (IVIG) as a single infusion was initiated, along with acetylsalicylic acid, which led to rapid clinical improvement. By the following day after IVIG administration, the boy became afebrile, his activity quickly recovered, his eyes appeared brighter, his appetite returned, and the cervical lymph nodes decreased in size. Echocardiography performed on the 10th day of illness revealed no abnormalities of the myocardium or coronary arteries. The boy was discharged on the 4th day after IVIG administration (the 13th day of

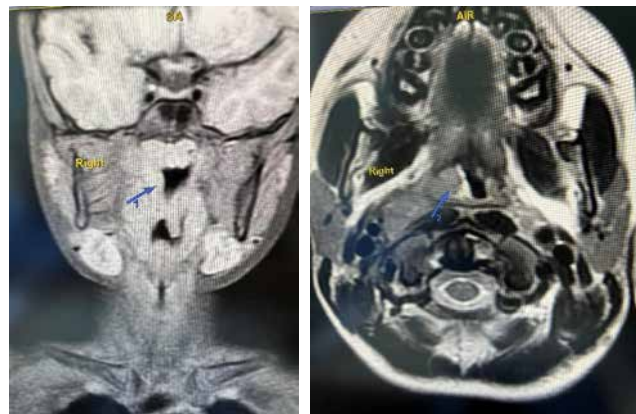


Fig. 1. MRI findings: right-sided tonsillitis and cervical lymphadenopathy. The right palatine tonsil is enlarged with well-defined but irregular contours; its structure appears homogeneous. A peripheral hyperintense MRI signal due to edema is observed (indicated by arrows)



Fig. 2. Bilateral non-exudative conjunctival injection in the patient

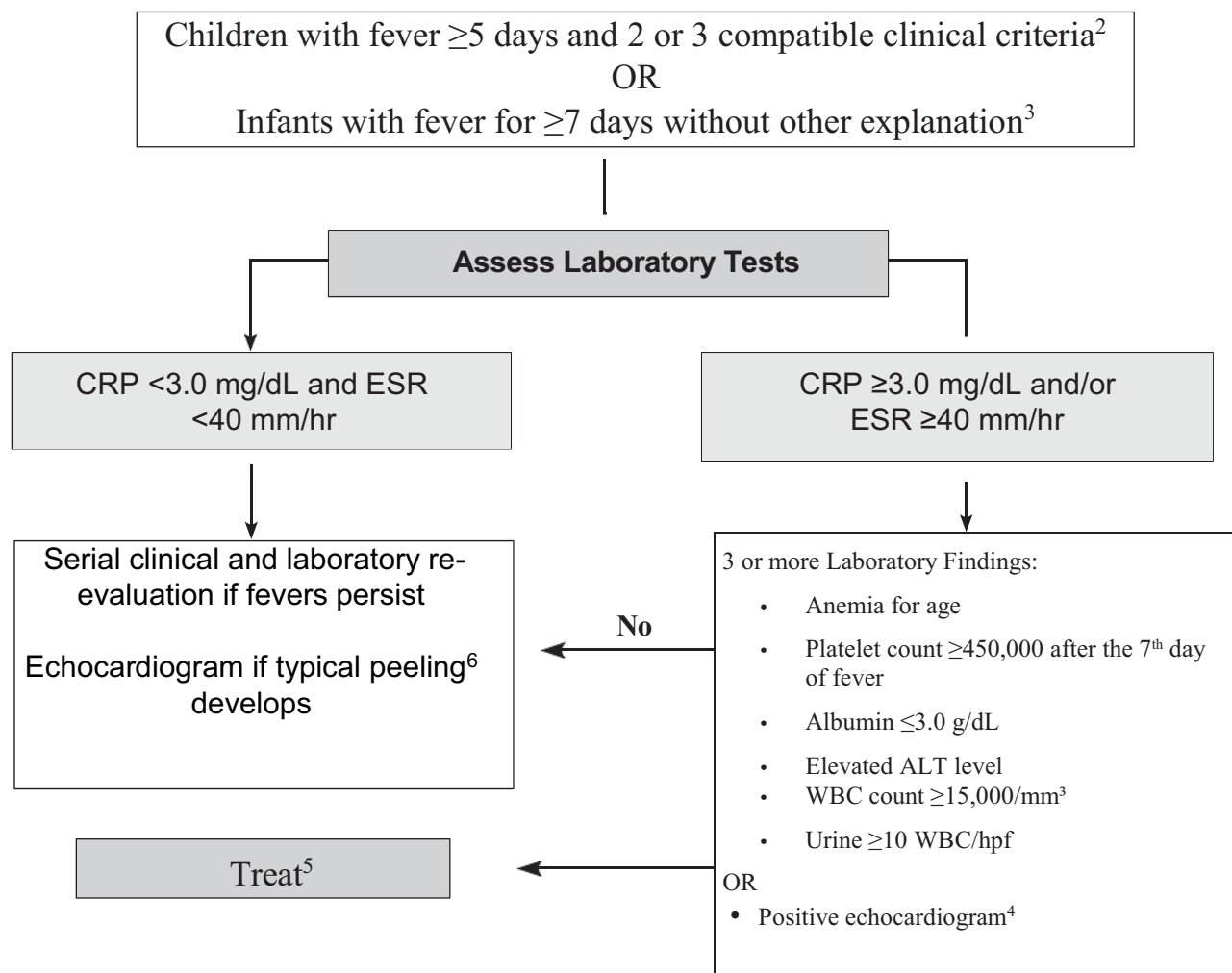
illness, 10th day of hospitalization) in a condition close to satisfactory.

Discussion

KD is an insidious condition that can present with symptoms resembling many infections of various localizations. Cases of KD mimicking purulent lesions of the peritonsillar region have been reported in the medical literature, although such presentations are uncommon. The major concern with KD is that approximately 25% of untreated patients, who do not receive timely and adequate therapy with intravenous immunoglobulin, will develop coronary artery involvement of varying severity [2]. More than 50% of children with KD present with atypical manifestations, which may lead to delayed or incorrect diagnosis and result in significant vascular damage. Less common presentations include otitis media, torticollis, symptoms mimicking deep neck infections, meningism, and acute tonsillitis. Signs such as stridor, neck pain, and dysphagia are less frequently observed in KD compared to retropharyngeal abscesses [8].

Lymphadenopathy, as a diagnostic criterion for KD, is the least common, occurring in 50–75% of

Evaluation of Suspected Incomplete Kawasaki Disease¹



Notes: 1 – In the absence of a “gold standard” for diagnosis, this algorithm cannot be evidence-based but rather represents the informed opinion of the expert committee. Consultation with an expert should be sought any time assistance is needed. 2 – Clinical findings of KD are listed in Table 3. Characteristics suggesting that another diagnosis should be considered include exudative conjunctivitis, exudative pharyngitis, ulcerative intraoral lesions, bullous or vesicular rash, generalized adenopathy, or splenomegaly. (3) Infants ≤6 months of age are the most likely to develop prolonged fever without other clinical criteria for KD; these infants are at particularly high risk of developing coronary artery abnormalities. (4) Echocardiography is considered positive for purposes of this algorithm if any of 3 conditions are met: Z score of left anterior descending coronary artery or right coronary artery ≥2.5; coronary artery aneurysm is observed; or ≥3 other suggestive features exist, including decreased left ventricular function, mitral regurgitation, pericardial effusion, or Z scores in left anterior descending coronary artery or right coronary artery of 2 to 2.5. (5) If the echocardiogram is positive, treatment should be given within 10 days of fever onset or after the tenth day of fever in the presence of clinical and laboratory signs (CRP, ESR) of ongoing inflammation. (6) Typical peeling begins under the nail beds of fingers and toes. ALT indicates alanine transaminase, and WBC, white blood cells.

Fig. 3. Algorithm for the evaluation of suspected incomplete KD [3]

cases, whereas the frequency of other classical KD criteria is about 80–90%. Cervical lymphadenopathy is described as an initial manifestation in only 12% of cases. Deep neck infection-like presentations occur in fewer than 5% of KD patients with head and neck involvement [1,6].

In our patient, KD was first suspected after the rise in platelet count in the CBC, even before the onset of conjunctival injection. However, intravenous immunoglobulin was administered only three days after the increase in platelet count. In Ukraine,

KD traditionally was associated with thrombocytosis (unpublished, empirical observations of the authors). Nevertheless, KD should be considered in any child with persistent fever lasting more than five days, accompanied by signs suggestive of «bacterial» infection unresponsive to antibiotic therapy, and when there is no clear correlation between clinical and instrumental findings.

In this case, the diagnosis of incomplete KD could already have been established on the 7th day of illness (the 4th day of hospitalization), based on the

2017 American Heart Association algorithm [3] (Figure 3), by combining clinical features—fever >5 days, cervical lymphadenopathy, marked oropharyngeal hyperemia – with laboratory findings: age-adjusted anemia (hemoglobin 110 g/L), platelet count $648 \times 10^9/L$, leukocytosis $22.7 \times 10^9/L$, absence of response to antibiotic therapy, bacterial-type hematological changes, and absence of peritonsillar abscess formation.

This case highlights the importance of considering KD in the differential diagnosis of children presenting with prolonged fever, a presumed «bacterial» etiology, and lack of response to antibiotic therapy [2]. KD is characterized by a wide spectrum of clinical manifestations that are not part of its «classical» diagnostic criteria but may occur as expressions of systemic inflammation and vasculitis [9]. The diagnosis of classical KD [7] is based on the presence of fever lasting more than 4–5 days combined with at least four of the following criteria:

- bilateral conjunctivitis (80–90% of cases);
 - changes in the oropharyngeal mucosa: injected and/or cracked lips, «strawberry tongue,» enanthem (80–90% of cases);
 - palmar and/or plantar erythema or edema and/or periungual desquamation during convalescence (80–90% of cases)
 - polymorphous non-vesicular rash, particularly on the trunk (>90% of cases);
 - cervical lymphadenopathy (at least one lymph node >1.5 cm) (50% of cases).
- Clinical manifestations that may occur in KD include a broad spectrum of systemic features, among which are conditions that may mimic retropharyngeal phlegmon (non-purulent) [7].

Other clinical symptoms and laboratory changes observed in Kawasaki disease:

- **cardiovascular system:** myocarditis, pericarditis, valvular regurgitation, shock, coronary artery abnormalities, aneurysms of medium-sized noncoronary arteries, aortic root dilatation, peripheral gangrene;
- **respiratory system:** peribronchial and interstitial infiltrates on chest radiography, pulmonary nodules;
- **musculoskeletal system:** arthritis, arthralgia (synovial fluid pleocytosis);
- **gastrointestinal tract:** vomiting, diarrhea, abdominal pain, hepatitis, jaundice, hydrops of the gallbladder, pancreatitis;

Table 2

Serial echocardiographic examinations of the child

ECHO	No. 1	No. 2	No. 3
Day of illness	10	17	54
LMCA, mm	2.6	2.8	2.6
LMCA, Z-score	0.51	1.08	0.52
Interpretation	N	N	N
LAD, мм	2.4	2.5	2.3
LAD, Z-score	1.11	1.39	0.88
Interpretation	N	N	N
RCA, мм	2.6	2.8	2.2
RCA, Z-score	1.32	1.85	0.34
Interpretation	N	N	N

Notes: ECHO – echocardiography; LMCA – left main coronary artery; LAD – left anterior descending coronary artery; RCA – right coronary artery, N – normal ranges.

- **central nervous system:** marked irritability, aseptic meningitis (cerebrospinal fluid pleocytosis), facial nerve palsy, sensorineural hearing loss;

- **genitourinary system:** urethritis/meatitis, hydrocele;

- **other manifestations:** erythema and swelling at the Bacillus Calmette-Guérin inoculation site, anterior uveitis (on slit-lamp examination), rash and desquamation in the groin area, and clinical features mimicking retropharyngeal phlegmon.

Suspicion of KD allows for an expanded diagnostic work-up, including echocardiography with a focus on the coronary arteries. The first echocardiographic examination was performed on the 10th day of illness. The results are presented in Table 2, including findings from subsequent echocardiographic assessments.

According to echocardiographic examinations performed on days 10 and 17 of illness, as well as in the late follow-up period (day 54), no coronary artery involvement was detected, as evidenced by normal Z-scores. In this case, early administration of intravenous immunoglobulin was crucial in improving the patient’s condition and preventing potential serious complications, such as coronary artery aneurysms.

Although in most children (approximately 75%) KD resolves without the development of coronary artery aneurysms even in the absence of IVIG administration, it is virtually impossible to predict which patients will have a favorable course and which will develop coronary artery aneurysms. However, it has been demonstrated that administra-

tion of immunoglobulin within the first 10 days of illness reduces the risk of coronary artery involvement from about 25% to approximately 4% [7].

The case described by the authors highlights the necessity of a multidisciplinary approach in the diagnosis and management of atypical manifestations of KD. The boy was evaluated by pediatricians, otolaryngologists, an infectious disease specialist, an immunologist, a hematologist, a radiologist, and a cardiologist. Awareness of KD, interdisciplinary collaboration, and a comprehensive approach to the patient were key to establishing the correct diagnosis, providing appropriate treatment, and ensuring adequate follow-up.

Conclusions

Early recognition of KD and timely therapeutic intervention are crucial to preventing potential complications, such as coronary artery aneurysms.

Physicians across multiple specialties should remain aware of these atypical presentations to ensure prompt and accurate diagnosis and treatment. In addition, this case underscores the importance of considering KD in children with persistent fever unresponsive to antibiotic therapy, even when the initial clinical picture suggests localized bacterial infection. Raising awareness among clinicians, especially those working in emergency, infectious diseases, and surgical settings, may significantly reduce diagnostic delays and improve patient outcomes.

The patient's parents provided informed consent for the publication of this article.

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