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CASE REPORT
OLGU SUNUMU

BCG Scar Reactivation as a Diagnostic Clue in Kawasaki Disease

Kawasaki Hastalığında Tanısal Bir İpucu Olarak BCG Skar Reaktivasyonu

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ABSTRACT

Kawasaki disease is an acute systemic vasculitis that generally affects children younger than five years of age. Infants, particularly young infants, may not fully meet the classical diagnostic criteria, making the diagnosis challenging. Bacillus Calmette-Guérin (BCG) scar reactivation has been described as a supportive clinical finding, particularly during the early phase of Kawasaki disease. In the presence of unexplained persistent fever, erythema and reactivation at the BCG vaccination site should alert clinicians to the possibility of Kawasaki disease, even when the typical clinical features are incomplete. In our case, initially evaluated with a preliminary diagnosis of an upper respiratory tract infection, Kawasaki disease was suspected based on a three-day history of fever, bilateral non-purulent conjunctivitis, a macular rash below the neck, lip hyperemia and BCG scar reactivation. Given that BCG vaccination is routinely administered at two months of age in our country, this case highlights the importance of BCG scar reactivation as an early clinical clue for the diagnosis of Kawasaki disease in infants.

Keywords: Kawasaki disease, infant, BCG scar reactivation

ÖZ

Kawasaki hastalığı, genellikle beş yaşın altındaki çocukları etkileyen akut sistemik bir vaskülittir. Küçük bebekler klasik tanı kriterleri tam olarak karşılamayabilir, bu nedenle tanı koymak zor olabilir. Özellikle Kawasaki hastalığının erken evresinde, Bacillus Calmette-Guérin (BCG) skar reaktivasyonu destekleyici bir klinik bulgu olarak tanımlanmıştır. Açıklanamayan yüksek ateş varlığında, tipik klinik bulgular tam olmasa bile BCG aşı yerinde gelişen eritem, BCG skar reaktivasyonu hekimler için uyarıcı bir bulgu olmalıdır. İlk başvurusunda üst solunum yolu enfeksiyonu ön tanısıyla değerlendirilen olgumuzda; 3 gündür olan ateş, bilateral non-pürülan konjonktivit, boyun altında maküler döküntü ve dudak hiperemisi ile birlikte BCG skar reaktivasyonu saptanması üzerine Kawasaki hastalığı düşünülmüştür. Ülkemizde BCG aşısının iki aylıkken rutin olarak uygulandığı göz önüne alındığında bu olgu, infantlarda Kawasaki hastalığı tanısında BCG skar reaktivasyonunun erken bir klinik ipucu olarak önemini vurgulamaktadır.

Anahtar kelimeler: Kawasaki hastalığı, infant, BCG skar reaktivasyonu

INTRODUCTION

Kawasaki disease (KD) is most commonly observed in children younger than five years of age, with the highest incidence occurring between six months and two years of age (1). The diagnosis of classic KD is established by the presence of fever lasting at least five days (with the day of fever onset considered day one), together with at least four of the following five principal clinical features: erythema and cracking of the lips, strawberry tongue and/or erythema of the oral mucosa; bilateral non-purulent conjunctivitis; maculopapular rash, diffuse erythroderma, or erythema multiforme-like eruptions; erythema and edema of the hands and feet in the acute phase and/or periungual desquamation in the subacute phase; and usually unilateral cervical lymphadenopathy (≥1.5 cm) (2,3).

The diagnosis of KD may be particularly challenging in young infants. In the presence of unexplained persistent fever, erythema at the Bacillus Calmette–Guérin (BCG) vaccination site should be considered a warning sign, even when the typical clinical features are not fully present (4). BCG scar reactivation in KD was first described by Dr. Tomisaku Kawasaki. Studies have reported that this finding occurs in approximately 30–50% of patients. Although it is not included among the diagnostic criteria, BCG scar

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reactivation is considered a useful and relatively specific clinical finding for early diagnosis, particularly in incomplete cases, as it typically occurs during the acute phase of the disease (5). In a study by Uehara et al., hyperemia, erythema or crust formation at the BCG vaccination site was observed in more than 70% of patients with KD aged 6–20 months (6). Furthermore, BCG scar reactivation has been included among the supportive findings in the sixth revision of the Japanese diagnostic guidelines (7).

The occurrence of erythema and crust formation at the BCG scar during the acute phase of KD was first reported in the Japanese literature in 1982 (8). Increased expression of the human 63-kDa heat shock protein (HSP) gene has been demonstrated during the acute phase of KD. This protein, also known as HSP63, is the human homolog of the HSP65 protein of Mycobacterium tuberculosis and shares approximately 65% amino acid sequence similarity. Therefore, it has been suggested that cross-reactivity between mycobacterial antigens contained in the BCG vaccine and possible infectious triggers of KD may contribute to the inflammatory response at the BCG scar (9).

In this case report, we present a six-month-old male infant diagnosed with Kawasaki disease (KD) at an early stage, based on a three-day history of fever and signs of reactivation at the BCG vaccination site.

CASE REPORT

A six-month-old male infant presented to the pediatric emergency department with a complaint of fever that had begun three days earlier. He had initially been evaluated with a presumptive diagnosis of an upper respiratory tract infection and was discharged on amoxicillin/clavulanic acid, along with antipyretic treatment using ibuprofen and paracetamol. During home monitoring, the fever reached a maximum of 39.1°C. As the fever decreased only transiently with antipyretics and subsequently recurred, the patient was readmitted to the pediatric emergency department and hospitalized for further evaluation and management.

He was born at 39+3 weeks of gestation, weighing 3250 grams, as the first child of a healthy 29-year-old father and a healthy 28-year-old mother. There was no prior history of hospitalization. He had received routine vaccinations appropriate for his age, had been exclusively breastfed for the first six months, and had recently transitioned to complementary feeding. There was no consanguinity between the parents, and no known family history of disease. The patient had no cough, rhinorrhea, diarrhea, constipation, or irritability during urination. Urine color and odor were normal. There was no recent history of infection among family members.

On initial physical examination at admission, the patient was conscious and alert, with appropriate responsiveness to his surroundings. The anterior fontanel measured 1×1 cm and the posterior fontanel was closed. The tonsils and oral mucosa were normal, and otoscopic examination was unremarkable. Bilateral nonpurulent conjunctivitis, hyperemia, and mild desquamation of the lower lip, and a macular rash tending to coalesce in the subcervical region were observed. No lymphadenopathy was detected in the postauricular, axillary, supraclavicular, or inguinal regions. A noticeable raised area measuring 0.5 cm x 0.5 cm and redness (reactivation) was observed at the BCG injection site on the left arm (**Figure 1a/1b**). There was no diaper rash in the genital area. The fingertips and toes were normal. Respiratory and cardiovascular examinations were unremarkable. The abdomen was soft, bowel sounds were normal, and no organomegaly was detected. Neurological examination revealed age-appropriate reflexes, with muscle strength assessed as 5/5.

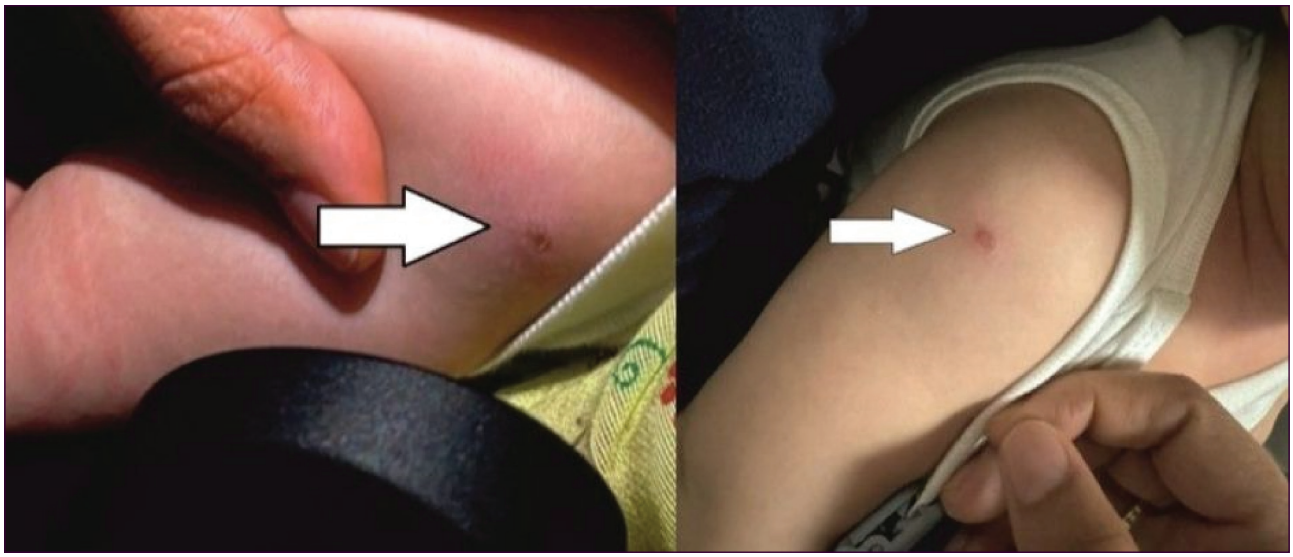

Figure 1a/1b. A noticeable swelling and redness (reactivation) measuring 0.5 cm x 0.5 cm at the BCG injection site on the left arm

Laboratory investigations performed on the first day of hospitalization showed a white blood cell count of 11200/mm^3, an absolute neutrophil count of 5600/mm^3, an absolute lymphocyte count of 3900/mm^3, hemoglobin of 10.6 g/dL, and a platelet count of 288000/mm^3. Biochemical analyses revealed aspartate aminotransferase of 347 IU/L, alanine aminotransferase of 205 IU/L, creatinine of 0.23 mg/dL, glucose of 100 mg/dL, and albumin of 34 g/L. Among acute phase reactants, C-reactive protein (CRP) was 55 mg/L (reference range 0–5), and the erythrocyte sedimentation rate (ESR) was 69 mm/hour (reference range 0–20). No atypical cells were observed on peripheral smear; neutrophil predominance was present, erythrocytes were hypochromic and microcytic, and the platelet count was adequate, with no toxic granulation detected. Urinalysis showed leukocyte esterase 1+ and leukocytes 3, with no erythrocytes or protein detected; urine culture showed no growth, and blood cultures showed no growth. Chest radiography, abdominal ultrasonography were normal. Echocardiographic evaluation performed at the time of diagnosis revealed no structural heart disease, and left ventricular systolic function was assessed as normal. Regarding the coronary arteries, the diameters were measured as follows: left main coronary artery (LMCA) 2.2 mm (Z-score: 1.13), left anterior descending artery (LAD) 1.7 mm (Z-score: 0.95), circumflex artery (Cx) 1.5 mm (Z-score: 0.52), and right coronary artery (RCA) 1.6 mm (Z-score: 0.77). All coronary artery Z-scores were found to be within normal limits, and no evidence of coronary artery dilation or aneurysm was observed. Epstein–Barr virus, cytomegalovirus, and respiratory viral panel results were negative. Because the patient had no purulent conjunctivitis or signs of an upper respiratory tract infection, no history of contact with a patient with measles, and a rash distribution that was not typical of measles, measles was not considered in the initial differential diagnosis. Furthermore, since the patient had a fever while the rash was present, roseola (sixth disease) was not considered in the differential diagnosis. Laboratory findings are presented in **Table 1**.

Our patient presented with a three-day history of fever and met only three of the classic diagnostic criteria for KD. Additionally, reactivation at the BCG vaccination site was observed. Although echocardiography revealed no abnormalities, liver enzyme, ESR, and CRP levels were elevated. Considering that reactivation at the BCG site during the course of KD typically occurs between the second and fourth days of the illness—and given that viral infections had been ruled out—a diagnosis of atypical KD was considered (within the first 24 hours of admission). Treatment was initiated with intravenous immunoglobulin (IVIG) at a dose of 2 g/kg, administered as a 12-hour infusion. Acetylsalicylic acid at a dose of 80 mg/kg/day was added to the treatment regimen. A gastric protective agent was also included in the regimen to prevent gastrointestinal side effects. The patient experienced a single episode of fever during the IVIG infusion. No further fever was observed after the completion of IVIG therapy, and conjunctival findings resolved. BCG scar reactivation improved approximately 18 hours after IVIG administration. Thrombocytosis was not detected during the subacute phase, and additional findings such as periungual desquamation did not develop. Following a 48-hour period without fever, it was planned to continue antiplatelet therapy (low-dose acetylsalicylic acid) at a dose of 5 mg/kg/day for 8 weeks.

Administration of live vaccines (measles, mumps, rubella, and varicella) was planned for 11 months after IVIG treatment, and the family was informed accordingly. Influenza vaccination was also recommended for the patient and family. The patient was discharged with plans for continued follow-up in cardiology and rheumatology outpatient clinics. No complications developed during the follow-up period, and echocardiography findings (assessed 2 and 6 weeks after treatment) were found to be normal. Written informed consent for publication of this case report and the accompanying images was obtained from the patient's legal guardians.

Table 1. Patient's laboratory values

	Day 1 of hospitalization	Second day of hospitalization	After IVIG
White blood cell count/ mm^3	11200	10600	7000
Absolute neutrophil count/mm^3	5600	5400	1300
Absolute lymphocyte count/mm^3	3900	3700	4200
Hemoglobin gr/dL	10.6	9.5	9.1
Platelets/mm^3	288000	265000	263000
C-reactive protein mg/dL	55	105	29
Sedimentation rate mm/hour	69	-	-
Aspartate aminotransferase IU/L	347	35	23
Alanine aminotransferase IU/L	205	80	37
Albumin mg/dL	34	-	-

DISCUSSION

Diagnosing KD in young infants can be challenging because the disease is relatively uncommon in this age group and the classical diagnostic criteria are often not fully met. This may lead to diagnostic delays and an increased risk of serious complications, particularly coronary artery involvement. Therefore, a high index of clinical suspicion is required when evaluating young infants with fever for possible KD. BCG scar reactivation, characterized by hyperemia and induration, may provide an important early diagnostic clue, particularly during the first few days of illness. Studies have reported that BCG scar reactivation occurs more frequently in younger children, suggesting that it may facilitate the early recognition of KD in infants and serve as an early warning sign (1,4,10,11).

In a comprehensive review by Narchi et al., the prevalence of BCG scar reactivation among children with KD who had previously received BCG vaccination was 38.6% (10). This represents a relatively high prevalence. However, because BCG vaccination is not routinely administered in every country, the role of BCG scar reactivation in KD has not been fully elucidated. Furthermore, the study reported a lower incidence of coronary artery abnormalities among infants with BCG scar reactivation. Similarly, echocardiographic findings were normal in our patient (10).

Diniz et al. also investigated the relationship between BCG scar reactivation and KD (11). Their findings, together with those of other studies, suggest that although BCG scar reactivation is not included among the core diagnostic criteria for KD, it may have diagnostic value, particularly in young infants (1,6,9,11,12).

Although BCG scar reactivation is not included in the diagnostic criteria because BCG vaccination practices vary among countries, it may represent a useful supportive finding in countries where BCG vaccination is routinely administered during early infancy (10,11). In our case, the presence of BCG scar reactivation on the third day of fever contributed to the early consideration and diagnosis of KD.

CONCLUSION

BCG scar reactivation should be considered a potentially valuable early clinical clue for KD, particularly in young infants presenting with persistent fever and incomplete clinical manifestations.

ETHICAL DECLARATIONS

Informed Consent: Written informed consent was obtained from all participants who participated in this study.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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REFERENCES

1. Roh DE, Kwon JE, Kim YH. Bacille Calmette-Guérin Site Reactivation of Kawasaki Disease in Infants under 3 Months of Age: Relation with Diagnosis and Prognosis. Children (Basel). 2022;9(6):857.
2. Houska N, Albertz M, Ing RJ. Update on Diagnosis and Management of Kawasaki Disease: A Scientific Statement From the American Heart Association. J Cardiothorac Vasc Anesth. 2025;39(5):1103-1105.
3. Jone PN, Tremoulet A, Choueiter N, et al. Correction to: Update on Diagnosis and Management of Kawasaki Disease: A Scientific Statement From the American Heart Association. Circulation. 2025;151(13):e863.
4. Asbik O, El Hachmi I, Elouali A, Rkain M, Babakhouya A. An Unexpected Diagnosis of Kawasaki Disease in a Three-Month-Old Infant: A Diagnostic Trap. Cureus. 2025;17(7):e87088.
5. Rezai MS, Shahmohammadi S. Erythema at BCG Inoculation Site in Kawasaki Disease Patients. Mater Sociomed. 2014;26(4):256-60.
6. Uehara R, Igarashi H, Yashiro M, Nakamura Y, Yanagawa H. Kawasaki disease patients with redness or crust formation at the Bacille Calmette-Guérin inoculation site. Pediatr Infect Dis J. 2010;29(5):430-3.
7. Kobayashi T, Ayusawa M, Suzuki H, et al. Revision of diagnostic guidelines for Kawasaki disease (6th revised edition). Pediatr Int. 2020;62(10):1135-1138.
8. Takayama J, Yanase Y, Kawasaki T. Study of the changes of the site of the BCG inoculation in MCLS (in Japanese). Jpn J Pediatr 1982;86: 567-572.
9. Kara A, Türkkanı Asal G, Tezer H, et al. Kawasaki hastalığı ve BCG reaktivasyonu: Bir vaka takdimi. J Pediatr Inf. 2006;49:42-5.
10. Narchi H, Skinner A. Bacillus Calmette-Guérin scar reactivation (BCGitis) in Kawasaki disease: a scoping review. Eur J Pediatr. 2026;185(5):289.
11. Diniz LMO, Castanheira RG, Giampietro YG, et al. Diagnostic Value of The Reaction at The Bacillus Calmette-Guérin Vaccination Site in Kawasaki Disease. Rev Paul Pediatr. 2021;39:e2019338.
12. Park SH, Yu JJ, You J, et al. Clinical Significance of the Bacille Calmette-Guérin Site Reaction in Kawasaki Disease Patients Aged Less than 18 Months. Pediatr. Infect. Vaccine. 2018;25:148–55.