

A Very Uncommon Complication Following Vaccination: Necrotizing Fasciitis and Myonecrosis: Case Report

Aşılama Sonrası Çok Ender Görülen Bir Komplikasyon: Nekrotizan Fasiit ve Miyonekroz

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ABSTRACT Necrotizing fasciitis (NF) and myonecrosis is a potentially lethal soft tissue infection characterized by extensive muscular, fascial and subcutaneous tissue necrosis. In this paper, we report an 18-month-old boy admitted to a health clinic three days after Hepatitis-B vaccine injection with cellulitis at his left lateral arm and axilla. He was recommended oral antibiotics, however in the fifth day after vaccination he became lethargic, there were pseudo-paralysis, edema, crepitus on palpation and cutaneous necrosis was observed at axillary region and at posterior arm. With the diagnosis NF and myonecrosis, all the necrotic tissue including pectoralis major, triceps brachii, and most of the rotator cuff muscles were excised. After cutaneous grafting, the wounds healed, but functional recovery of the shoulder joint was poor at 4 year follow-up. Early diagnosis of NF and myonecrosis with debridement of necrotic tissue can prevent severe life threatening complications

Key Words: Vaccination; complications; fasciitis, necrotizing

ÖZET Nekrotizan fasiit ve miyonekroz, yaygın kas, fasya ve subkutan doku nekrozu ile karakterize ve hayati tehlike yaratabilen bir yumuşak doku enfeksiyonudur. Bu yazıda Hepatit-B aşısı yapıldıktan üç gün sonra sol omuz ve aksillada selülit ile çocuk acil polikliniğine başvuran ve oral antibiyotik tedavisi verilen 18 aylık erkek hasta rapor edilmektedir. Aşıdan beş gün sonra çocuk letarjik şekilde ortopedi kliniğimize başvurmuş, muayenede sol kolunda psödoparalizi, ödem, palpasyonda krepitus, aksillada ve kolun posteriorunda yaygın cilt nekrozu tespit edilmiştir. NF ve miyonekroz tanısı ile nekrotik olan pektoralis major, triseps brachi ve rotator manşet kaslarının çoğu debride edilmiştir. Cilt greftleme ile yara kapatılmış ancak 4 yıllık takibinde omuz fonksiyonlarının iyi olmadığı tespit edilmiştir. NF ve miyonekroz, hayati tehlikeyi önlemek için erken tanı ve tedavi edilmesi gereken bir hastalıktır.

Anahtar Kelimeler: Aşılama; komplikasyon; nekrotizan fasiit

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World Health Organization(WHO) classified adverse reactions of vaccinations, depending on the cause, as follows: (1) vaccination-induced reactions (due to an effect of the vaccine itself or an idiosyncrasy); (2) reactions due to errors in storage, handling, manipulation and/or administration; (3) coincidental reactions (no causal relationship with the vaccine); and (4) unknown. (WHO) Although coincidental reactions due to irrelevant etiologies frequently occur after vaccination, all local reactions can be attributed to immunization itself. Hepatitis B vaccination has become widely accepted after early 1990s. Severe adverse events have been reported in adults, but they are relatively infrequent in children.¹

Necrotizing fasciitis (NF) is a potentially lethal soft tissue infection characterized by extensive fascial and subcutaneous tissue necrosis.²⁻⁴ It usually presents as a postoperative complication, and occurrence following trauma or without apparent cause is rare. Early recognition, aggressive surgical debridement and treatment with antibiotics are crucial for a successful outcome. In this paper, we report an 18-month-old boy with NF and myonecrosis of the left shoulder region that occurred after Hepatitis-B vaccine injection.

CASE REPORT

A-18-month-old, previously healthy child was admitted to pediatrics clinic with erythema and swelling in his left shoulder on the second day following a single dose hepatitis-B vaccine injection. Upon examination, he had a temperature of 38°C. The respiratory rate and the blood pressure were within normal limits. He was prescribed oral sulbactam ampicillin and paracetamol. His symptoms subsided then, but exacerbated thereafter, upon which he was admitted to our clinic on the 5th day after vaccination. He was lethargic and minimally responsive to painful stimuli. There were pseudo-paralysis, edema, crepitus on palpation which was supported by air shadows on the plain x-rays and cutaneous necrosis was observed at axillary region and at posterior arm (Figure 1). Laboratory examination (erythrocyte sedimentation rate, C-reactive protein and white blood cell count elevation) sug-

gested an acute infection. On the same day, all the necrotic tissue including pectoralis major, triceps brachii, and most of the rotator cuff muscles were excised (Figure 2). Although, the axillary/brachial artery and brachial plexus were intact; the shoulder had no motor function. The radial nerve had to be covered with a rotational latissimus dorsi muscle flap. Blood culture and intraoperative aerobic cultures were obtained and empiric treatment with intravenous cefazolin and gentamisin was started. Anaerobic culture could not be obtained. The results of all cultures were negative. After cutaneous grafting, the wounds healed, but functional recovery of the shoulder joint was poor at 4-year follow-up.

DISCUSSION

Hepatitis B vaccines (HBVs) are composed of purified preparations of hepatitis B virus surface antigen (HBsAg). In placebo-controlled studies, common side effects other than local reactions were reported to occur in a similar rate among vaccine recipients and individuals receiving a placebo. However, a number of controversial adverse events have been reported to be associated with HBVs, including rheumatoid arthritis (RA), diabetes, demyelinating diseases (e.g., multiple sclerosis), chronic fatigue syndrome, and more recently lymphoblastic leukaemia.⁵ Local reactions are reported to be common after HBV vaccinations in children. De Serres et al screened adverse events of HBV in 1130 children, and in a 7-day period after HBV im-



FIGURE 1: Clinical picture of the infant at admission; wide cutaneous edema around left shoulder and cutaneous necrosis at axillary region.



FIGURE 2: Postoperative picture of the shoulder region after wide resection of necrotic skin and muscles.

munization, 24.2% of children suffered at least one adverse event.⁶ Among these reactions, cellulitis was the most common adverse reaction which mostly recovered with suitable medications. Our patient presented with local cellulitis and was treated accordingly, however the clinical condition deteriorated and NF with myonecrosis developed. Although the cause of this deterioration was unclear, close follow up of the patient with cellulitis could relieve early diagnosis of NF.

The possible cause of local soft tissue infection and NF in our case might be contamination of the needle during handling or manipulation, and direct inoculation of the microorganism into the subcutaneous and muscular tissues rather than the vaccine itself. There are no reports in the literature which presents NF as a direct result of Hepatitis B vaccine injection, however there are two papers reporting two adult patients who developed NF at the injection site. Saw et al reported a 55-year-old diabetic woman who developed a life-threatening necrotizing fasciitis after acupuncture treatment for osteoarthritis of the knee.⁷ Birkinshaw et al reported NF at the shoulder region as a complication of steroid injection of a painful shoulder in a previously healthy female.⁸ Necrotizing fasciitis with myonecrosis has not been reported in children as a complication of routine vaccination or injection. However, minor trauma and small punctures are

known causes of NF in children. Mordehai et al reported three infants with NF and myonecrosis, and minor trauma was the cause in two of his three patients.⁹ The cause may be physical injury or inoculation of microorganisms by the needle.

Necrotizing fasciitis is usually an adult disorder and is rare in pediatric population. It has been reported following minor trauma, insect bites, local and systemic infections and surgical procedures.^{3,9-14} It is also common after varicella infections.¹² The disease can be presented with cellulitis or small abscesses and primary diagnosis of NF can be misinterpreted. Wong et al reported that only 14.6 percent of his adult patients had a diagnosis of NF or a suspicion of NF on admission.⁴ Other clinical signs at initial presentation are tenderness beyond the apparent margins of infection, erythema, warmth of the skin to palpation and altered sensation. Moss et al reported that all of the 20 patients with NF in his series had altered consciousness.³ The infants could be lethargic and minimally responsive to stimulation or invasive procedures. Children with immune deficiency states, neutropenic states following chemotherapy are susceptible to NF as well.¹⁰

In conclusion, NF following a single injection may be initially misinterpreted as localized cellulitis, and initial suspicion may prevent further serious and life threatening complications.

REFERENCES

- Grotto I, Mandel Y, Ephros M, Ashkenazi I, Shemer J. Major adverse reactions to yeast-derived hepatitis B vaccines--a review. *Vaccine* 1998;16(4):329-34.
- Brook I. Microbiology and management of infectious gangrene in children. *J Pediatr Orthop* 2004;24(5):587-92.
- Moss RL, Musemeche CA, Kosloske AM. Necrotizing fasciitis in children: prompt recognition and aggressive therapy improve survival. *J Pediatr Surg* 1996;31(8):1142-6.
- Wong CH, Chang HC, Pasupathy S, Khin LW, Tan JL, Low CO. Necrotizing fasciitis: clinical presentation, microbiology, and determinants of mortality. *J Bone Joint Surg Am* 2003;85-A(8):1454-60.
- Duclos P. Safety of immunisation and adverse events following vaccination against hepatitis B. *Expert Opin Drug Saf* 2003;2(3):225-31.
- De Serres G, Duval B, Boulianne N, Rochette M, Dionne M, Fradet MD, et al. Importance of attributable risk in monitoring adverse events after immunization: hepatitis B vaccination in children. *Am J Public Health* 2001;91(2):313-5.
- Saw A, Kwan MK, Sengupta S. Necrotizing fasciitis: a life-threatening complication of acupuncture in a patient with diabetes mellitus. *Singapore Med J* 2004;45(4):180-2.
- Birkinshaw R, O'Donnell J, Sammy I. Necrotizing fasciitis as a complication of steroid injection. *J Accid Emerg Med* 1997;14(1):52-4.
- Mordehai J, Kurzbart E, Cohen Z, Mares AJ. Necrotizing fasciitis and myonecrosis in early childhood: a report of three patients. *Pediatr Surg Int* 1997;12(7):538-40.
- Murphy JJ, Granger R, Blair GK, Miller GG, Fraser GC, Magee JF. Necrotizing fasciitis in childhood. *J Pediatr Surg* 1995;30(8):1131-4.
- Barton LL, Jeck DT, Vaidya VU. Necrotizing fasciitis in children: report of two cases and review of the literature. *Arch Pediatr Adolesc Med* 1996;150(1):105-8.
- Peterson CL, Vugia DJ, Meyers HB, Chao SM, Vogt J, Lanson J, et al. Risk factors for invasive group A streptococcal infections in children with varicella: a case-control study. *Pediatr Infect Dis J* 1996;15(2):151-6.
- Viani RM, Lewis A, Bradley JS. Postoperative group B streptococcal necrotizing fasciitis in a previously healthy child. *Pediatr Infect Dis J* 1997;16(6):630-1.
- Taviloğlu K, Yanar H. [Necrotizing fasciitis]. *Turkiye Klinikleri J Surg Med Sci* 2007; 3(28):101-4.