Olgu Sunumu
Case Report

Nicolau Syndrome after intramuscular clindamycin injection

İNTRAMUSKÜLER KLİNDAMİSİN ENJEKSİYONU SONRASI NICOLAU SENDROMU

Erhan AYGÜN[1], Yakup YEŞİL[2], Mehmet Fatih KELEŞOĞLU[3]

[1]İstanbul Üniversitesi, İstanbul Tıp Fakültesi, Çocuk Sağlığı ve Hastalıkları Anabilim Dalı, Neonatoloji Bilim Dalı, İstanbul, Türkiye
[2]Kanuni Sultan Süleyman Eğitim Araştırma Hastanesi, Çocuk Sağlığı ve Hastalıkları Anabilim Dalı, İstanbul, Türkiye
[3]İstanbul Üniversitesi, İstanbul Tıp Fakültesi, Çocuk Sağlığı ve Hastalıkları Anabilim Dalı, Pediatrik Romatoloji Bilim Dalı, İstanbul, Türkiye

ABSTRACT
Nicolau syndrome is a rare complication of intramuscular injections caused by various drugs that presents with severe pain at the injection site. It is characterized by local aseptic necrosis, skin necrosis, and rarely, muscle necrosis on the injection site. Although it may rarely occur after intramuscular injection of anti-inflammatory drugs, corticosteroids, local anesthetics, penicillin and interferon, in our literature search we encountered no cases of Nicolau syndrome after clindamycin injections. Herein, we report a case of Nicolau sydrome that occurred after intramuscular clindamycin injection in the right-middle thigh because of its rarity.

Keywords: Nicolau Syndrome, clindamycin, intramuscular injection

ÖZ
Nikolau sendromu, enjeksiyon bölgesinde şiddetli ağrı ile ortaya çıkan çeşitli ilaçların neden olduğu kas içi enjeksiyonların nadir görülen bir komplikasyonudur. Lokal aseptik nekroz, cilt nekrozu ve nadiren enjeksiyon bölgesinde kas nekrozu ile karakterizedir. Antienflamatuar ilaçların, kortikosteroidlerin, lokal anesteziklerin, penisilin ve interferonun intramüsküler enjeksiyonundan sonra nadiren görülebilmesine rağmen, literatür araştırmamızda klindamisin enjeksiyonlarından sonra hiçbir Nikolau sendromu vakasıyla karşılaşılmadı. Bu yazıda, sağ orta uylukta intramüsküler klindamisin enjeksiyonu sonrası meydana gelen bir Nikolau sendromu olgusu sunuldu.

Anahtar Kelimeler: Nikolau Sendromu, klindamisin, intramüsküler enjeksiyon

Erhan AYGÜN
İstanbul Üniversitesi, İstanbul Tıp Fakültesi, Çocuk Sağlığı ve Hast. A.D., Neonatoloji B.D., İstanbul, TÜRKİYE
orcid.org/0000-0002-4495-5824

Nicolau syndrome was first reported in 1920 after the use of intramuscular bismuth salts for the treatment of syphilis [1]. In the pathogenesis, most reasonable hypotheses point towards arterial embolism of the drug itself or to ischemia resulting from periarterial injection. Periarterial injection can provoke ischemia either owing to compression when sizeable volumes are injected or owing to arterial vasospasm. Nicolau syndrome typically presents with the development of burning and stabbing excruciating pain after injection, along with pallor, followed by bluish-red reticulate erythema and the formation of a necrotic eschar that heals in a few days with an atrophic scar [2]. It has been associated with the injections of antibiotics, piroxicam, diclofenac, corticosteroids, local anesthetics, and sclerotherapy agents [3, 4].

DEU Tıp Derg 2019;33(3):257-260
J DEU Med 2019;33(3):257-260
doi: 10.5505/deutfd.2019.96658

Gönderim tarihi/Submitted:25.06.2019
Kabul tarihi/Accepted: 03.09.2019

We report a case with typical features of Nicolau syndrome that was noteable because of the rarity of the syndrome coupled with the fact that it has not previously been reported after clindamycin injection.

CASE

A boy aged 7 years was admitted with symptoms of diffuse pain, swelling, red discoloration, and patchy ecchymosis in the right thigh after injection of clindamycin for acute tonsillitis. There was no history of other trauma or use of systemic or topical medications. The patient was hospitalized for further evaluation. On examination, a well-defined, tender, large lesion of 15 × 5 cm with sharp borders was found at the top of the right thigh (Figure 1). Heterogenic echogenicity was seen in the ultrasound examination. Doppler ultrasound of the right lower limb was normal. Other system examinations were normal. Laboratory workup including kidney function, liver function tests, electrolytes, creatine kinase levels, complete blood count variables, and coagulation tests were normal. The patient was treated with systemic antibiotics (for suspected cellulitis), analgesics, and low-molecular-weight heparin. The patient's pain resolved in a few days but there was no significant improvement in the lesion. Nicolau syndrome was suspected and the patient was discharged without any treatment. At the end of the first month, there was partial improvement with hyperpigmentation and scarring (Figure 2). The last follow-up visit took place eight months after the incident and the wound was nearly completely healed (Figure 3).

Figure 1.

Figure 2.

Figure 3.

DISCUSSION

The prevalence of the complications occurring after intramuscular injections ranges from 0.4 to 19.3%. Complications include pain, hemorrhage, nerve damage, tissue necrosis, joint contractures, development of scar, hematoma, and pseudotumor. If the drug is injected into subcutaneous tissue instead of muscle, its absorption is delayed, which then leads to more tissue reaction. This reaction induces lichenification with local tissue necrosis and inflammation [2, 5].

Nicolau syndrome has been related to the administration of a variety of drugs including non-steroidal anti-inflammatory drugs (NSAIDs) such as diclofenac sodium, ketoprofen, and piroxicam; corticosteroids; diphtheria; tetanus and pertussis vaccines; meperidine; the penicillin group; and glatiramer acetate [6-11].

As far as we know, our patient is the first case first Nicolau syndrome associated with clindamycin in the literature. Nicolau Syndrome, a substantially rare clinical situation characterized by pain, skin discoloration, and necrosis, occurs following intramuscular drug injection [12]. This syndrome may be seen within a spectrum of symptoms ranging from simple skin ulcerations to sepsis and extremity amputations [13]. Our patient had symptoms of diffuse pain, swelling, red discoloration, and patchy ecchymosis in the right thigh.

There is no specific treatment for this syndrome. Conservative methods have been suggested such as wound dressing, debridement, bed rest, pain control, antibiotics for superimposed infections, vasoactive agents such as pentoxyphylline to impede the vasospasm, anticoagulants such as heparin, and hyperbaric oxygen have been found to be helpful [11, 14].

Even though this syndrome develops very rarely, it is an important cause of morbidity. It is an iatrogenic condition, in particular of injection administration in particular by nurses [14]. However, a seemingly simple procedure for healthcare workers, it needs to be done carefully. Some precautions have been suggested to prevent such cases [15, 16]. Aspiration must be practiced before the injection to ensure that the injection point is correct.

Although safe drug volumes in intramuscular injection administration change according to the patients' age and injection site, it must be 0.5-1 mL for deltoid muscle, 0.5-2 mL for the vastus lateralis, 0.5-3 mL for the ventrogluteal region, and 1.4-4 mL for dorsogluteal region.

Cold compress application after intramuscular injection should be avoided. If more than one injection is needed, different sites must be chosen instead of the same site. If the patient reports excessive unpredicted pain during administration, injections should be stopped. Care should be taken with the choice of needle size, region, and method to decrease complication rates after intramuscular injection administrations.

REFERENCES

1. Corazza M, Capozzi O, Virgilit A: Five cases of livedo-like dermatitis (Nicolau's syndrome) due to bismuth salts and various other non-steroidal anti-inflammatory drugs. J Eur Acad Dermatol Venereol. 2001;15(6):585-588.

2. Nischal K, Basavaraj H, Swaroop M, Agrawal D, Sathyanarayana B, Umashankar N: Nicolau syndrome: an iatrogenic cutaneous necrosis. J Cutan Aesthet Surg. 2009;2(2):92-95.

3. Sarifakioglu E: Nicolau syndrome after diclofenac injection. J Eur Acad Dermatol Venereol. 2007;21(2):266-267.

4. Ramelet AA, Parmentier L: Delayed Nicolau's livedoid dermatitis after ultrasound-guided sclerotherapy. Dermatol Surg. 2010; 36(1):155-158.

5. Kim SK, Kim TH, Lee KC: Nicolau syndrome after intramuscular injection: 3 cases. Arch Plast Surg. 2012;39(3):249-252.

6. McGee AM, Davison PM: Skin necrosis following injection of non-steroidal anti-inflammatory drug. Br J Anaesth. 2002;88(1):139-140.

7. Kim KK: Nicolau syndrome in patient following diclofenac administration: a case report. Ann Dermatol. 2011;23(4):501-503.

8. Lee DP, Bae GY, Lee MW, Choi JH, Moon KC, Koh JK: Nicolau syndrome caused by piroxicam. Int J Dermatol 2005;44(12):1069-1070.

9. Guarneri C, Bevelacqua V, Polimeni G: Embolia cutis medicamentosa (Nicolau syndrome). QJM 2012, 105(11):1127-1128.

10. Kienast AK, Mentze D, Hoeger PH: Nicolau's syndrome induced by intramuscular vaccinations in children: report of seven patients and review of the literature. Clin Exp Dermatol. 2008;33(5):555-558.

11. Ocak S, Ekici B, Cam H, Taştan Y: Nicolau syndrome after intramuscular benzathine penicillin treatment. Pediatr Infect Dis J. 2006;25(8):749.

12. Hamilton B, Fowler P, Galloway H, Popovic N: Nicolau syndrome in an athlete following intramuscular diclofenac injection. Acta Orthop Belg. 2008;74(6):860-864.

13. De Sousa R, Dang A, Rataboli PV: Nicolau syndrome following intramuscular benzathine penicillin. J Postgrad Med. 2008;54(4):332-334.

14. Uzun S, Arslan F: Commentary on Tang FI, Sheu JS, Yu S, Wei IL, Chen CH (2007) nurses relate the contributing factors involved in medication errors. Journal of Clinical Nursing 16, 447-457. J Clin Nurs. 2008;17(17):2375-2376.

15. Dadaci M, Altuntas Z, Ince B, Bilgen F, Tufekci O, Poyraz N: Nicolau syndrome after intramuscular injection of non-steroidal anti-inflammatory drugs (NSAID). Bosn J Basic Med Sci 2015, 15(1):57-60.

16. Pullen RL: Administering medication by the Z-track method. Nursing. 2005;35(7):24.