**Nicolau Syndrome in 29 Months Boy: Another Report of Iran**

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**Abstract:** Nicolau syndrome (NS) is a very rare complication of intramuscular injections that leads to some degree of necrosis in skin, subcutaneous fat and muscles. The type of injected Drugs and wrong injection methods are the main factors for this iatrogenic syndrome. Here we report a 29 months boy, one of the Iranian children affected NS following the wrong intramuscular injection of Benzathine Penicillin. But he came back home without any major complication because of a good hospital care. Reports of mortality and severe morbidity of common injection drugs such as penicillin derivates will help to prevent such iatrogenic syndromes.

**Keywords:** Nicolau syndrome, Benzathine Penicillin, Embolia Cutis Medicamentosa, Livedoid Dermatitis.

**INTRODUCTION**

Nicolau syndrome is a very rare iatrogenic syndrome caused mostly by intra muscular injection of some drugs that leads to skin and soft tissues and muscle necrosis [1]. Another name of this complication is Livedoid Dermatitis and also called Embolia Cutis Medicamentosa. soon after injection Severe pain at the injected site followed by skin discoloration with erythematic and livedoid reticular patches presents. After that tissue become necrosis. Atrophic scars ,sepsis and limb amputation are some side effects of this syndrome and death because of compartment syndrome and sepsis have been reported in some patients [2]. This syndrome is mostly caused by intramuscular injections, although followed by subcutaneous and intra-articular injections have also been reported [3, 4, 6].

17 hours hemorrhagic rashes and livedoid reticular patches began from right lower Quadrant of abdomen till all right limb. After 24 hours, compartment syndrome began in right limb that colored doppler sonography revealed Pressure on the lower limbs veins. Extremity pulses like dorsalis pedis and posterior tibialis did not palpable.

**Consent**

Written informed consent was obtained from the patient's parent for publication of this Case report and any accompanying images.

**CASE REPORT**

A 29-months boy who lives in south of Iran, with full vaccination records and without any past medical history after suspicious to have streptococcal pharyngitis treated with penicillin benzathine. Drug was injected very fast and in upright position. Immediately after the injection, the patient suffered from pain at injection site and became discomfort .During first hours paresthesia developed in right lower extremity. After 2 hours, discoloration was generated in right limb. After

![Fig. 1: Livedoid reticularis feature after 24 hours](http://saspjournals.com/sjmcr)
Necrosis began in toes (Fig. 2). The patient was transferred to educational hospital and immediately was taken to operating room and right calf fasciotomy was done. Patient needed serial fasciotomy and medical treatment with pentoxifylline and subcutaneous heparin was administered. Regardless of intensive care systemic infection happened with Pseudomona Auroginosa and treated with systemic anti biotics CT angiography of right femoral artery after the first fasciotomy, showed decreased flow in posterior tibialis (Fig. 3).

Fig. 2: Necrotic toes

Because of delay in diagnosis and treatment of this syndrome 2 toes became necrosis and one of them amputated. After 2 months he discharged from hospital and after 6 months could walk again.

DISCUSSION

Nicolau syndrome also known as lividio like dermatitis or Emboli cutis Medicamentosa is a very rare Iatrogenic necrotizing skin syndrome happened mostly after intramuscular injections [1]. This syndrome has also been reported followed by subcutaneous, intra venous and even intra-articular injections [3-6].

This syndrome was first described in 1924 by Freudenthal followed by injection of Bismuth salt for treatment of syphilis [7]. This syndrome has been described with various drugs, such as penicillin, local anesthetics, corticosteroids, NSAIDs etc. [7] (Table 1).

After injection patient immediately complained of severe pain at the injection site, erythematic and skin lesions such as hemorrhagic and purlish lividio reticular patches spread. These are pathognomonic manifestations of this syndrome as happened in our patient [7, 9].

Table 1: Drugs causing Nicolau Syndrome

<table>
<thead>
<tr>
<th>Drugs</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSAIDs</td>
<td>Diclofenac, Piroxicam, Ibuprofen</td>
</tr>
<tr>
<td>Anti Biotic</td>
<td>Penicillin drivates, Tetracyclines, Gentamycin Streptomycin</td>
</tr>
<tr>
<td>Corticosteroid</td>
<td>Dexamethasone, Triamcinolone, Hydrocortisone</td>
</tr>
<tr>
<td>AntiPsychotic</td>
<td>Chlorpromazine</td>
</tr>
<tr>
<td>Vaccine</td>
<td>DTP</td>
</tr>
<tr>
<td>Anti Histamin</td>
<td>Diphenhydramine, Hydroxyzine</td>
</tr>
<tr>
<td>Local anesthia</td>
<td>Lidocaine</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>INFα, Vit K, Bismuth salts, B complex vitamins, &amp; Epinephrin</td>
</tr>
</tbody>
</table>

After few hours’ skin, subcutaneous fats and muscles become necrosis.

The exact pathogenesis of this syndrome still remains unclear. Perhaps Drugs micro crystals cause vascular damages. As seen in skin biopsy of these patients these crystals irritate and compress arteries and lead to Ischemia and tissue necrosis [7, 8, 10].

Ultra sonography of affected areas shows diffuse thickening with increase echogenecity of skin and subcutaneous layers. MRI (T2-weighted) shows edema and fluid collections at involved area [13].

It has no definitive treatment, but some preservative treatments depending on the severity and depth of the syndrome were described.

Serial debridement with dressing and some analgesic and vasoactive drugs such as pentoxifylline showed good effectiveness. Use of pentoxyphyline as vasoactive agent in combination with hyperbaric oxygen had beneficial effect in some records [11].

Yildiz et al. used hyperbaric oxygen in the treatment of NS to prevent the necrosis and to decrease amputations [12].

Because these patients are very high risk for infections, when any clue of septicemia happened treatment with antibiotics should be considered.
Correct injection techniques and familiarity with fatal side effects of incorrect injections are the most important principles.

One thing that should always be considered is use of right needle size and Z track method for injections. However aspirations before injection is very important to ensure no vessels are involved.

CONCLUSION
This syndrome basically is preventable. Reports of mortality and severe side effects of common injection drugs such as penicillin derivates will help to prevent such iatrogenic syndromes.

Abbreviations

REFERENCES