

An Unusual Case of Cutaneous Gangrene

MAHALINGAM SOUNDARYA, KUMAR RANJITH, BHAT KAMALAKSHI

ABSTRACT

Benzathine penicillin is used intramuscularly for the prophylaxis of rheumatic heart disease. We describe here, a child with cutaneous gangrene following an accidental intra-arterial injection of benzathine penicillin in the gluteal area, which was

resolved by symptomatic therapy. This is a dangerous but possible adverse effect of this commonly used drug, which can occur due to the practical difficulties which are faced in ruling out intra-arterial injection with this opaque and viscous preparation.

Key Words: Benzathine penicillin, Cutaneous gangrene, Intra-arterial injection

KEY MESSAGE

- The intra-arterial injection of Benzathine penicillin is a dangerous and possible adverse effect of this commonly used drug, which is used by paramedical workers in outreach centres. Hence, using the penicillin preparations with caution, and the immediate management of the complications if any, is the need of the hour.

INTRODUCTION

Benzathine penicillin is a drug which is commonly used for the secondary prophylaxis of rheumatic fever, which has a high incidence in our country. This drug is being given deep intramuscularly to children for many years and in children with valvular heart disease, a lifelong treatment is required. Hence, this drug is being administered in many smaller hospitals and outreach centres and even by paramedical personnel. We report here, an adverse event of this drug that is rare; so far, only few (3) cases have been reported, mostly in infants; it can occur even when the utmost caution is used in the administration of the drug, but it has near lethal consequences.

CASE HISTORY

A 9 year old boy, who was on secondary prophylaxis with Inj. Benzathine penicillin for rheumatic fever since 7 months, received an intramuscular injection of Benzathine penicillin in the right gluteal region, after being tested for hypersensitivity by using crystalline penicillin. The child was kept under observation for the next half an hour and was then discharged. As the child walked for about 5 minutes, he developed an excruciating pain over the injection site and in both the lower limbs, mainly in the calf muscles, more on the right side. There was no paresthesia. The right lower limb was pale and cold to touch and the injection site was tender but normal in colour. The child had tachycardia (130/min) and hypertension (170/90 mm of Hg). Peripheral pulses were felt normally in both the lower limbs [Table/Fig-1]. The neurological examination of the affected limb revealed hypotonia, areflexia, reduced power (2/5) and flexor plantar response. The other limb also showed similar findings, but with a better tone and power (3/5). The response to any sensory stimulus was inconsistent. An immediate I.V. access



[Table/Fig-1]: Gangrenous areas at site of injection at 6 hrs

was secured and one dose of injection hydrocortisone was given. Hot water compresses, I.V. fluids and analgesics were started simultaneously. After about 45 minutes, there was a reduction in the pain and erythematous patches were noticed over the tender oedematous right gluteal region and over the tip of the toes, which became more prominent after 12 hours [Table/Fig-2].

Six hours after the injection, there was a gradual neurological recovery, as was evident through an improved muscle power (4/5), a normal muscle tone, diminished reflexes (1+) and normal sensations over the right lower limb. Also, there was improvement in the temperature of the right lower limb. By 18 hours, there were multiple irregular cutaneous gangrenous patches over the swollen, tender, right gluteal region and the distal 1/3rd of the right foot, along with a restriction of the hip movements and discolouration

of the tip of the glans penis [Table/Fig-3]. The child was started on I.V. heparin and antibiotics (Piperacillin + Tazobactam, Amikacin). Heparinization was continued for 4 days with regular monitoring of the PT-INR. USG showed oedematous gluteal maximus with no evidence of haematoma or joint effusion. Arterial Doppler was normal in both the lower limbs. At 44 hours, a fasciotomy was done [Table/Fig-4]. The blood and tissue cultures were sterile. In view of the hypertension, nifedipine was added, which was continued for 4 days and was then stopped. The blood investigations on day



[Table/Fig-2]: Gangrenous area of the distal extremity of the same limb



[Table/Fig-3]: Gangrene of tip of penis and scrotal region



[Table/Fig-4]: Fasciotomy site over the gangrene



[Table/Fig-5]: Healed area over the site of injection after 3 weeks



[Table/Fig-6]: Healed areas over distal extremities of same limb

1 showed leucocytosis (16750/cmm) with neutrophilia (87%), a borderline platelet count (1.56 lakh) and elevated liver enzymes (SGPT=396); urea, creatinine and electrolytes were normal. The child was discharged after 8 days once the symptoms improved and he was able to walk with mild pain. At review after 2 weeks, he had an antalgic gait with healed skin lesions over the gluteal region and peeling of the skin over the previous gangrenous patches over the anterior 1/3rd of the foot [Table/Fig-5 and 6]. The child is currently on oral penicillin V prophylaxis and is neurologically normal.

DISCUSSION

An accidental intra-arterial injection of benzathine penicillin is a possible but hazardous side effect of this drug. Benzathine penicillin and Procaine penicillin, both being opaque and viscous preparations for intramuscular injection, the visualization of the aspirated blood is difficult and hence, there is no absolute possibility of being completely sure of avoiding the intravascular injection of the drug [1]. A spectrum of injuries, sometimes permanent, to the gluteal region, the distal extremities, the perineum and the spinal cord, has been documented, which results from the inadvertent intra-arterial injection, probably due to vascular occlusion by the large crystals of the penicillin salts [2]. On further analysis of the literature, it was postulated that the patient had received an unintentional injection of Benzathine penicillin into the gluteal artery and that he subsequently developed the 'Nicolau syndrome', which has been described as 'livedoid dermatitis' – a very rare complication of the intramuscular injections which manifest as

excruciating pain, immediately after the injection, followed by discolouration and oedema [3,4]. As the clinical features of such an accidental intra-arterial injection depend on the vessel into which the penicillin salt had been injected, dangerous and irreversible complications like progressive paralysis and paraplegia which are similar to transverse myelitis, have been described in the literature following the occlusion of the spinal vasculature. The earlier case reports have been documented in infants, wherein even profound complications like coma, convulsions and death have occurred [5].

Our case report reiterates the fact that the complications which are associated with an intramuscular injection of Benzathine penicillin, which have been described in the literature in the earlier decades and now have almost been forgotten, are still very significant. In peripheral health set ups where auxiliary health professionals administer the drug intramuscularly, these adverse events are

very much possible and they could end up in very dangerous and sometimes lethal side effects. Hence, using penicillin preparations with caution, awareness of the occurrence of such complications and their immediate management is the need of the hour.

REFERENCES

- [1] Wynne JM, Williams GL, Elliman BA. Accidental intra-arterial injection of Benzathine penicillin. *Arch Dis Child* 1978; 53: 396-400.
- [2] Weir MR. intravascular injuries due to intra-muscular penicillin. *Clin Pediatr (Phila)* 1988 Feb; 27/ 2: 85-90.
- [3] Wroneckik, Czernik J. Nicolau Syndrome. *Z Kinderchir* 1981 Apr; 32/4: 367-70. PMID 7282075
- [4] Ocak S, Ekici B, Cam H, Tastan Y. Nicolau syndrome – a complication of intra-arterial Benzathine penicillin. *Paed Infect Dis J*. Aug 2006; 25(8): 749. PMID-16874179
- [5] Stafford WW, Mena H, Piskun WS, Weir MR. Transverse myelitis due to the intra-arterial administration of penicillin. *Neurosurgery* 1984 Oct; 15(4):552-6.

AUTHOR(S):

1. Dr. Mahalingam Soundarya
2. Dr. Kumar Ranjith
3. Dr. Bhat Kamalakshi

PARTICULARS OF CONTRIBUTORS:

1. M.D Paediatrics, Kasturba Medical College, Mangalore (Affiliated to Manipal University), India.
2. M.D. Paediatrics, Kasturba Medical College, Mangalore, India.
3. M.D.Paediatrics, Kasturba Medical College, Mangalore, India.

NAME, ADDRESS, TELEPHONE, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Mahalingam Soundarya, Assistant Professor,
Department of Paediatrics, Kasturba Medical College Hospital,
Attavara, Mangalore. Pin 575001
E-mail: soundarya29@gmail.com

DECLARATION ON COMPETING INTERESTS:

No competing Interests.

Date of Submission: Jun 10, 2011
Date of peer review: Aug 22, 2011
Date of acceptance: Aug 22, 2011
Date of Publishing: Nov 11, 2011