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 MESSION
- 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 paresthasia. 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 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 oedematous patches were noticed over the tender 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 discoloration...
of the tip of the glans penis [Table/Fig-3]. The child was started on I.V. heparin and antibiotics (Piperacillin + Tazobactum, 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 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


