

CASE REPORT

GANGRENE OF LEFT HAND FOLLOWING ACCIDENTAL INTRA-ARTERIAL INJECTION OF PHENYTOIN SODIUM

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Abstract

We report a three months old male child, who suffered from gangrene of the left hand due to accidental intra-arterial phenytoin injection. The baby was put on subcutaneous low molecular weight heparin and recovered completely. The case is being reported to the need of extra precaution during the administration of phenytoin and alternative drug; fosphenytoin should be considered for therapy of status epilepticus.

Key words: Phenytoin, gangrene, accidental intra-arterial injection

Introduction

Phenytoin is a commonly prescribed anticonvulsant and used to treat most types of seizure disorders and status epilepticus. The parenteral form of phenytoin is dissolved in 40% propylene glycol and 10% ethanol and adjusted to a pH of 12; sodium hydroxide is added to maintain solubility. Extravasation of the solution may cause skin irritation or phlebitis. Phenytoin administered intravenously at a rate higher than 1mg/kg/minute (50 mg/min) may cause hypotension and arrhythmias. These complications are believed to be secondary to the diluents, propylene glycol (1). Intra arterial phenytoin injection has been previously reported causing gangrene and amputation of digits (2). We report a case where intra arterial phenytoin was accidentally injected into left radial artery leading to gangrene in a baby with status epilepticus. Extra caution should be maintained while using such toxic drugs during emergencies. In case of difficult venous access, other routes such as intra-nasal or per-rectal should be sought or other alternative drugs should be used if possible.

Case Report

A 3 months old infant was referred to us with black discoloration of the left thenar eminence and the thumb. There was a 24 G cannula in the radial aspect of the left forearm. It was removed from the site immediately and put in the dorsal aspect of the right hand. The infant had been referred to us from a hospital outside and as per their discharge slip, he had presented in status epilepticus. There he had been given injection lorazepam and a loading dose of phenytoin in 1:3 dilution with normal saline. Suspecting phenytoin induced gangrene, we started low molecular weight (LMW) heparin (Enoxaparin) in the child and oral phenytoin was started as maintenance in dose of 5 mg/kg/day 12 hourly. Intravenous cloxacillin and metronidazole was also started and given for 10 days. A color doppler scan of the left forearm was done on day 2 of admission, revealing thrombosis of the right radial artery with a compensatory increase in flow in the ulnar division. The gangrene did not further increase in extent, and third day onwards the color of the affected region started to improve (Fig 1). The child

showed good recovery. After formation of superficial blisters, there was peeling off of the overlying skin. The color of the underlying skin was normal. (Fig 2) On day 14 the LMW heparin was stopped. The EEG of the infant revealed generalized seizure discharges. CT scan and MRI of cranium were normal. Other investigations including electrolytes and serum calcium were normal. No cause could be established for the seizures and the infant was discharged on day 14 as a case of seizure disorder with phenytoin induced iatrogenic gangrene of the left radial artery. A color doppler scan was done before discharge that showed resolution of the thrombus with improved perfusion in the left thenar aspect. An opinion was taken from the plastic surgeons, and no further active intervention was advised. On subsequent follow up, child showed good recovery with no recurrence of seizure.

Figure-1: Swelling of left hand with black scabbed lesions on thenar eminence and thumb on day 3.



Figure-2: Photograph of the hand with lesions on day 14.



Discussion

Phenytoin is an antiepileptic used for seizure control both during emergency and as an oral drug. Being very alkaline; extravasation of phenytoin can lead to severe phlebitis and thrombosis. Other acute side effects of phenytoin are ataxia, tremors, nystagmus and encephalopathy. It may also lead to fatal cardiac arrhythmias. Sentenie et al. have described a similar case as ours where inadvertent intra-arterial phenytoin injection led to digital gangrene and subsequent amputation. (2) Extravasation of phenytoin may result in the -purple glove syndrome. (3,4) The incidence of phenytoin extravasation is between 3% and 7% and results in a chemical cellulitis, which may progress to necrosis requiring amputation. (5)

In hand, the presence of the deep palmar arch fed dually by the radial and ulnar arteries serves as a protective factor in the accidental thrombosis of any one artery. There is considerable overlap in the area of distribution of the arteries and reduction of flow in one is compensated by an increased flow in the other. This could have been one of the mechanisms for the limited damage as seen in our case.

Awareness may decrease the likelihood of phenytoin extravasation injury. A patent IV catheter should be used to infuse phenytoin, accompanied by liberal infusion with saline (6). Systematic monitoring will permit discontinuation of the infusion at the first sign of extravasation (7). Tucking the extremities should be avoided, if possible. Fosphenytoin, may be considered in management of status epilepticus as there are no reports till date of such extravasation injury.(4) Drugs such as hyaluronidase (8) and nitroglycerine (9) have been used in phenytoin extravasation . In our case LMW heparin was given to prevent thrombus extension. The thrombus started to show resolution on day 7 onwards and by day 14 it had completely resolved. The child at 4 weeks of follow up showed good functional and cosmetic recovery.

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E-published: 1st May 2012. **Art#**28

DOI No. 10.7199/ped.oncall.2012.28

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