ACCIDENTAL INTRA-ARTERIAL DRUG INJECTION (A Case Report)

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Introduction

Intra-arterial drug injection is a rare emergency. The condition was first reported in 1942 by Van der Post [1]. Such accidental injections result in acute ischemia of the affected extremity and digital gangrene is common. The problem is increasingly being encountered in drug addicts ('main liners') [2]. Prompt recognition and early treatment is necessary to prevent amputation and permanent disability [3]. We report a case of accidental intra-arterial drug injection which was successfully managed by intra-arterial thrombolytic therapy.

Case Report

A 29-year-old serving soldier was admitted to a peripheral Military Hospital on 11 Dec 95 for a perianal abscess. He was treated first with oral antibiotics and later with intramuscular cloxacillin. An 'intravenous' injection of cloxacillin was administered to him in the right cubital fossa in the morning of 17 Dec 95. He was assured that this would be less painful than the intramuscular injection. Towards the end of the injection he developed excruciating pain over the medial aspect of the forearm and the middle, ring, and little fingers. Clinical examination revealed a bluish discolouration of these fingers and the affected part was cool to touch. A diagnosis of vasospasm or thrombosis was entertained and he was treated with intravenous fluids, injection phenargan, local heparin application over the affected part, oral nicotinic acid, and analgesics. Despite these measures pain persisted and he was unable to sleep. He was transferred to Pune for further management.

At admission on 23 Dec 95 he was restless and writhing in pain. Examination revealed that the medial 3 fingers were blue, mottled and cold; the latter extended to the medial part of the forearm. The ulnar artery pulsation was absent on the right side while it was well felt on the left. A 2 cm cord-like swelling was felt just below the cubital fossa in the long axis of the forearm. Doppler studies confirmed lack of flow in the ulnar artery.

Laboratory investigations (including coagulation profile) were within normal limits. He was diagnosed as a case of ulnar artery thrombosis, secondary to accidental intra-arterial drug injection, and was treated with systemic heparin, lomodex infusion, tablet nifedipine 10 mg 8 hourly, antiplatelet therapy in the form of tablet disprin 1 OD and analgesics including narcotic analgesics.

Despite these conservative measures there was no improvement in his condition. Angiography was performed on 01 January 96 and revealed non-visualization of the right ulnar artery and deep palmar arch due to thrombosis (Fig 1). Digital arteries to the medial 3 fingers showed diminished flow. He was treated with an intra-arterial thrombolytic agent. Urokinase in a dose of 50,000 Units dissolved in 10 mL of normal saline was injected in the brachial artery over 10 minutes followed by 2,00,000 Units over next 30 minutes. This was followed by infusion of heparin 1,000 Units/h for next 6 hours via the catheter sheath. The coagulation parameters were monitored. Check angiography after 6 hours revealed restoration of flow in the ulnar artery and improved blood supply to the affected digits (Fig 2). The patient showed a dramatic response: the pain disappeared and the affected parts regained normal temperature and colour over the next 48 hours. The pulsations returned in the affected ulnar artery. A small area of bluish discolouration over the ring finger persisted for a few days and then gradually disappeared. When reviewed 2 months later the patient was asymptomatic. The affected digits were normal in appearance and function and the radial and ulnar pulsations were well felt on the affected side.

Discussion

Injection of drug into an artery is a sporadic event. It may be accidental or associated with drug abuse. At first sight it appears puzzling because the simple expedient of withdrawing blood into the syringe prior to an 'IV' injection should preclude its occurrence. The brachial artery is the commonest site of accidental injection [4]. This has been attributed to a high bifurcation of the artery above the cubital fossa, resulting in injection in the

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Fig. 1 : Angiogram of arteries of the hand showing thrombosis of the ulnar artery and the proximal palmar arch following intra-arterial drug injection.

brachial or the aberrant ulnar artery [1]. Intra-arterial drug injection may cause vessel injury by one of several mechanisms. The vessel may be obstructed by inert particles or drug crystals. Hemolysis, platelet aggregation, vasospasm and venous thrombosis are the other contributory factors [2]. All this leads to acute thrombosis of the artery. Compromised blood supply to the digits due to this thrombosis may lead to gangrene.

Treatment of this injury consists of rest, analgesia, systemic heparinization, antiplatelet agents and anti-sludging agents like dextran. However, these measures rarely suffice alone and aggressive therapy is mostly indicated. Intra-arterial injection of vasodilators appears to be beneficial [5]. Intra-arterial tolazoline blocks arterial smooth muscle alpha-adrenergic receptors causing vasodilation. It also dilates precapillary arterioles and opens precapillary arteriovenous shunts in skin and has been effectively used in some patients [6]. Steroids decrease progressive tissue necrosis and have been tried orally, intravenously or intra-arterially. Decadron has been used in the dose of 40-70 mg intra-arterially with encouraging results [3].

Since arterial thrombosis is the final common pathway for injury, intra-arterial thrombolytic therapy appears a logical treatment in this condition. Both streptokinase [6] and urokinase [7] have been occasionally employed with good results. The present patient responded dramatically to intra-arterial urokinase therapy. Using the percutaneous transfemoral (Seldinger) technique, the catheter

Fig. 2 : Repeat angiogram showing restoration of flow in the ulnar artery following successful thrombolytic therapy.

ter is advanced close to the area of thrombosis and a bolus of thrombolytic agent is followed by continuous infusion over the next few hours. Monitoring of coagulation parameters (Prothrombin time, activated partial thrombin time, plasma fibrinogen level) is mandatory to anticipate and prevent serious bleeding complications. Use of concomitant heparin infusion via the sheath is recommended to prevent pericatheter thrombosis. The two major complications associated with thrombolytic therapy are bleeding and anaphylaxis. The latter is more common with streptokinase. Contraindications to thrombolytic therapy include active internal bleeding, recent cerebrovascular accident, intracranial pathology, recent surgery or trauma, known allergy to the agent, and uncontrolled hypertension. Improvement following surgical exploration of the artery and irrigation with heparinized saline has also been reported for managing intra-arterial drug injection injuries [8], but is infrequently employed in clinical practice.

Accidental intra-arterial drug injection is a rare iatrogenic injury. A high index of suspicion is necessary for its recognition. An aggressive management strategy is required to prevent gangrene of digit. Intra-arterial thrombolytic therapy may result in an occasional dramatic improvement as in this case.

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