
Case Report

Intravenous Injection of Diazepam to Cubital Vein Can be Complicated by Accidental Intra-Arterial Penetration and Gangrene

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We present an elbow disarticulation due to accidental intra-arterial injection of diazepam. Considering the risk of inadvertent and accidental intra-arterial injection of diazepam and its subsequent severe sequelae that are reported in the literature, we emphasize that intravenous diazepam should be administered with more hesitancy and care.

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Introduction

Diazepam is a well-known drug used in many disorders such as convulsion and anxiety. Despite its safety regarding systemic side effects, its local complications can be catastrophic. Many cases with accidental intra-arterial injection of diazepam have been reported in the literature.¹⁻⁵ Because the treatment of this incident is empirical, every effort should be taken to prevent its occurrence.

Case Report

A 26-year-old woman presented with headache and mild anxiety to emergency department at 3 a.m. Headache had been started from some hours ago. She was a known case of multiple sclerosis and had been treated with ergotamine for the last five years. She had no history of psychologic problems and had not taken any other drugs in the last month.

Vital signs were normal and general physical examination was unremarkable. A diazepam vial was ordered by the physician to be injected intravenously. Assuming the tip of the needle to be

in a vein at the anterior aspect of the right antecubital fossa, 10 mg diazepam was injected slowly by the nurse in-charge. The patient complained of severe knocking pain in the entire right forearm during the injection. Despite this pain, the injection was continued to the end and the patient discharged with some analgesics. Three hours later she was referred again to the same physician and received some more analgesics. At that time the patient was able to move her fingers but had paresthesia and severe pain. Seven hours later she was visited by the chief resident at the clinic of surgery and was admitted to the department of surgery because of pain, severe swelling, pallor, and absence of radial and ulnar pulses. She underwent an emergency vascular exploration for surgical help and 10 mL lidocaine (1%) was injected around the brachial artery. She was also heparinized. Seventy-two hours later an elbow disarticulation was done by an orthopedic surgeon because of dark skin and gangrene (Figure 1). Surgical exploration revealed that the tissues in the antecubital fossa and even a little bit proximal to the injection site were necrotic (Figure 2). Histopathologic examination confirmed infiltration of inflammatory cells and thrombosis.

Discussion

Several cases with irreversible complications of accidental intra-arterial injection of diazepam have been reported in the literature.¹⁻³

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Figure 1. Three days after the injection; the limb is gangrenous.

Diazepam is a well-known and effective drug in various diseases, but one should be aware of the fact that its intravenous injection could be catastrophic. Although the rate of thrombophlebitis increases with intravenous injection of diazepam,⁶ the main problem is its extravasation into the brachial artery where it can obliterate the blood flow through thrombus formation.

The pathogenesis of the thrombosis and gangrene that follow intra-arterial injection of diazepam is not fully understood; however, spasm of the artery and crystallization of the drug are among the main suggested causes.⁴ Thrombosis and arterial obliteration can occur several hours later, so the presence of distal pulses does not indicate that no tragedy is going to happen.⁵

In all cases presented in the literature, the patients had complained of a severe pain radiating to distal parts.¹⁻³ Hence, we strongly suggest to stop the injection if pain occurs. Accepting the aforementioned pathogenesis theory, the best



Figure 2. Reveals that all tissues including brachial artery are necrotic.

strategy to confront this event is to decrease the concentration of the drug. It is recommended that the needle to be left in place and the artery flushed with a vasodilator such as papaverine or procain.⁷ Heparin is mandatory because it inhibits the coagulation cascade. Sympathectomy, nerve block, steroids, hyperbaric oxygen, and streptokinase have been suggested as treatment modalities in the literature, but they have not improved the eventual outcome.^{8,9,10} Care should be taken to determine that any injection will not be intra-arterial and that perivascular extravasation will not take place.

Errors in technique of injection and compromised care as a consequence of overcrowded hospitals can enhance the probability of accidental intra-arterial injection.^{1,3,4,11} In this particular case, none of the patient's-related risk factors such as arterial anomalies and prematurity, which usually exist in other reported cases^{11,7} were present. It seems that lack of adequate knowledge of the physician and the nurse regarding complications of diazepam played the important role in development of this complication. The nurse who was injecting the diazepam was also overburdened in an extremely busy situation.

We emphasize on more hesitancy in intravenous diazepam injection in emergency rooms and more vigilance in recognizing the immediate complications.

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