

Accidental intra-arterial injection of midazolam and pethidine during endoscopy: a reminder that a routine procedure can result in disaster

A cannula for venous access was placed in the antecubital fossa of a 60-year-old man for the delivery of analgesia and sedation during colonoscopy, and 5 mg midazolam and 50 mg pethidine were injected. The patient complained about heat, burning, and ongoing pain in his right forearm. The skin of the forearm was red, with some white spots similar in appearance to hives. After an infusion system was connected to the cannula, it became evident that there was backflow of arterial blood, and it was realized that the cannula had been placed in a small artery. Immediate infusion of 20 mL of 0.9% saline solution, 10 mL of lidocaine 0.5%, and 20 000 units/24 hours of heparin into the involved artery resulted in symptomatic relief within 8 hours and there were no negative sequelae.

Accidental intra-arterial injection of these drugs can lead to severe tissue damage, resulting in compartment syndrome, gangrene, and amputation [1,2]. Although there are no specific guidelines for the management of unintended arterial drug injection, some successful strategies can be gleaned from published case reports [3,4]. The management should include dilution of the drug in the arterial vasculature, vasodilation to counteract vasospasm, and anticoagulation to prevent thrombosis. A combination of vasodilators (calcium-channel blockers, iloprost, papaverine, lidocaine), sympathetic nerve plexus blockade, and anticoagulant/thrombolytic agents (heparin, urokinase, tissue plasminogen activator, platelet aggregation/thrombokinasase inhibitors) have circumvented the need for surgical fasciotomy or thrombectomy in the past [3].

There are a number of recommended precautions that should ensure safe venous access and avoid unintentional intra-arterial drug injection [3,5] and these are illustrated in **Figures 1** and **2**. Because pain is a typical symptom of inadvertent arterial injection, health personnel should be particularly aware of patients who might not be able to report this symptom and who are therefore at increased risk (such as unconscious, pedia-



Figure 1 Precautions for safe venous access. A blood pressure cuff should be used instead of a tourniquet because a tight tourniquet can suppress arterial pulsation. The cannula should not be closed with a screw cap. Always connect an infusion system to the cannula because this will reveal any backflow of arterial blood.

tric, or mentally handicapped patients). We think that this report is noteworthy because it is possible that most endoscopists are not aware of this rare complication and are also not familiar with the management of this emergency situation.

Endoscopy_UCTN_Code_CPL_1AN_2AB

S. Saad¹, J. Horn²

¹ Department of Visceral, Vascular, and Transplantation Surgery, University Witten-Herdecke, Clinic Cologne-Merheim, Cologne, Germany

² Department of Anaesthesiology, University Witten-Herdecke, Clinic Cologne-Merheim, Cologne, Germany



Figure 2 Avoid the marked “danger” areas, which have been reported to have a prevalence of abnormal arteries of 1%–14% [3]. The brachial artery and the basilic vein can be very close together in the antecubital fossa. Abnormal arteries are not infrequently encountered in the forearm, where arterial branches from the radial and ulnar arteries sometimes form a superficial vascular network. Alternatively, veins on the dorsum of the hand or foot can be used to gain venous access, but, even there, unintended intra-arterial injections have been described [5]. In cases where there has been unintended intra-arterial injection of drugs, associated with severe tissue damage, the cannula should not be removed from the involved artery and a vascular surgeon should be consulted.

References

- 1 Goldberg I, Bahar A, Yosipovitch Z. Gangrene of the upper extremity following intra-arterial injection of drugs: a case report and review of the literature. *Clin Orthop Relat Res* 1984; 188: 223–229
- 2 Goldsmith D, Trieger N. Accidental intra-arterial injection: a medical emergency. *Anesth Prog* 1975; 6: 180–183
- 3 Sen S, Chini E, Brown M. Complications after unintentional intra-arterial injection of drugs: risks, outcomes and management strategies. *Mayo Clin Proc* 2005; 80: 783–795
- 4 Andreev A, Kavrakov T, Petkov D, Penkov P. Severe acute hand ischemia following an accidental intraarterial drug injection, successfully treated with thrombolysis and intraarterial iloprost infusion: case report. *Angiology* 1995; 46: 963–967
- 5 Ghouri AF, Mading W, Prabaker K. Accidental intraarterial drug injections via intravascular catheters placed on the dorsum of the hand. *Anesth Analg* 2002; 95: 487–491

Bibliography

DOI 10.1055/s-2007-966408

Endoscopy 2007; 39: E198–E199

© Georg Thieme Verlag KG Stuttgart · New York ·
ISSN 0013-726X

Corresponding author

S. Saad, MD

Department of Visceral, Vascular, and
Transplantation Surgery
University Witten-Herdecke
Clinic Cologne-Merheim
Ostmerheimerstr. 200
51109 Cologne
Germany
Fax: +49-221-8907-8561
stefansaad@aol.com