

CORRESPONDENCE

PERIOPERATIVE MEDICINE

Drug extravasation: can ultrasound-guided puncture and aspiration help?

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Summary: The authors have drawn the attention towards perhaps a common complication during intravascular techniques, and a novel use of ultrasound to aspirate the extravasated fluids / drugs to minimize the damaging effects.

Abbreviations: GA: general anesthesia; MAC-age: Age-adjusted minimum alveolar concentration

Key words: Patient Safety; Perioperative; Point-of-Care Ultrasound; Anesthetics

Citation: Vankdavath L, Karim HMR, Arora P. Drug extravasation: can ultrasound-guided puncture and aspiration help? *Anaesth. pain intensive care* 2022;26(6):836–837; DOI: [10.35975/apic.v26i6.2073](https://doi.org/10.35975/apic.v26i6.2073)

Received: October 14, 2022; **Accepted:** November 10, 2022

Drug extravasation in anesthesia and critical care practice is primarily preventable and imperative for the quality of healthcare delivery. Extravasation damage can cause disability from increased risk of infection and acute compartment syndrome as the damage can involve soft tissues, neurovascular components, tendons, and joints and even cause tissue necrosis.^{1,2} While propofol extravasation is well-reported, propofol and vecuronium extravasation in their clinical course are probably not reported yet. Here, we report a case highlighting the use of point-of-care ultrasonography for guiding aspiration punctures.

A 46-year-old gentleman with a T2-T3 intramedullary extradural lesion, underwent hemilaminectomy and excision under GA. The patient was induced through an 18G IV cannula secured preoperatively in the right hand with fentanyl 80 µg, propofol 100 + 40 mg, and succinyl choline 100 mg. Inj. vecuronium 5 mg was used as a muscle relaxant to facilitate tracheal intubation. GA was maintained with oxygen, nitrous oxide and isoflurane at MAC-age 1–1.2. After prone positioning, endotracheal tube and line positions were again evaluated. However, after one and a half hours, swelling over the hand around the Venecath was noticed: extravasation of drugs was suspected. The swelling extended to the palmar space and the thenar eminence. A total of 3 mg vecuronium in 1 mg bolus aliquots and 1 G paracetamol had been infused through this line. Intraoperatively slight diastolic hypertension was noted; 100 mg propofol in 20 mg aliquots was also administered to control it. Although

the recovery from anesthesia seemed to take longer than usual, it did not fulfil the delayed recovery criteria. Nevertheless, he was more sedated than usual even after one hour postoperatively.

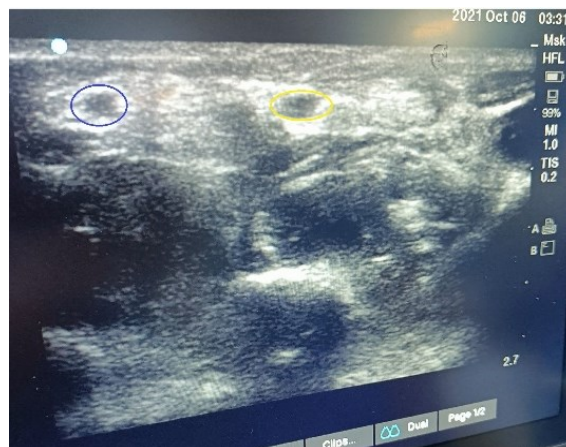


Figure 1: Showing the patent radial and ulnar artery on USG

The use of the active Venecath was abandoned. Subsequent drugs and fluids were administered through a new Venecath on his left foot.

Aspiration was tried through the affected line, but no back-flow was noted; Venecath was removed. On examination of the involved hand, radial and ulnar pulsations were present; the swelling was fluctuant, and the overlying skin was slightly discoloured. Pulse-oximetry assured pulsatile flow with a good plethysmograph (Figure 1a satellite), but the PI was

towards the lower side. US showed patency and flow in radial and ulnar arteries (Figure 1); color and doppler were used to confirm it.

US guided cannula was placed into the prominent fluid pockets (Figure 2) at three sites, and gentle squeezing was performed; only a few drops came out but kept oozing from the puncture sites. The patient was advised to rest the limb in an elevated position; swelling subsided significantly by the next day without any further sequelae. The pain was managed with paracetamol and tramadol.

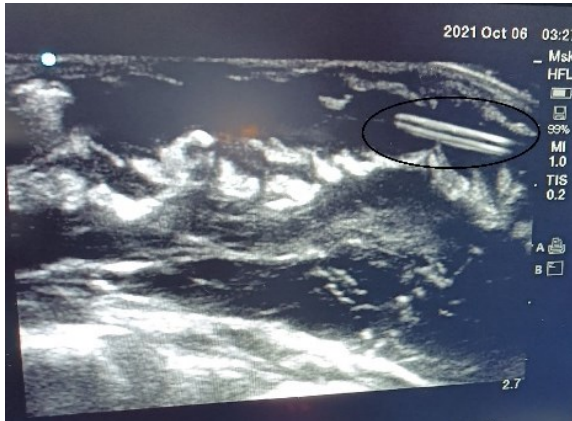


Figure 2: USG cannula placement in the extravasated drug pocket

Propofol extravasation is well reported. However, most cases show significant tissue injury, compartment syndrome, and even necrosis.^{1,3} Our patient had edema and skin discoloration but no significant tissue injury. However, there was prolonged recovery time due to the slow release of extravasated drugs. The pain in the hand might be due to drug-induced chemical injury / burn,⁴ mainly due to propofol and /or mechanical compression in the palmar space. Fortunately, our patient had no significant adverse events requiring further interventions. Patients with comorbidities such as malnutrition, peripheral vascular diseases and diabetes

may be prone to tissue necrosis secondary to its high lipid content.^{3,5} We tried an ultrasound-guided content aspiration, intending pressure reduction and imminent compartment syndrome risk mitigation. Propofol being a good culture media, the patient should also be followed up for infection, and antibiotic prophylaxis might also be considered. Surgical consultation should be obtained for the management of tissue necrosis if present.

Frequent inspections are suggested when the Venecath site is covered, to prevent such incidents.

Conflict of Interest

The authors report no conflicts of interest.

Ethical Approval

Not applicable

Author contribution

All authors took part in the management of this patient and manuscript preparation.

References

1. Basak P, Poste J, Jesmajian S. Propofol extravasation and tissue necrosis. *Indian J Dermatol.* 2012 Jan 1;57:78. [PubMed] DOI: [10.4103/0019-5154.92692](https://doi.org/10.4103/0019-5154.92692)
2. Karim HM, Ahmed G, Yunus M, Bhattacharyya P. Point to ponder while prescribing phenytoin sodium infusion in septic shock patients: A case-based discussion. *J Advanced Clin Rese Insight.* 2016; 3(1):38-40. DOI:[10.15713/INS.JCRI.101](https://doi.org/10.15713/INS.JCRI.101)
3. Schummer W, Schummer C, Bayer O, Müller A, Bredle D, Karzai W. Extravasation injury in the perioperative setting. *Anesth Analg.* 2005 Mar;100(3):722-727. [PubMed] DOI: [10.1213/01.ANE.0000154442.30278.3C](https://doi.org/10.1213/01.ANE.0000154442.30278.3C)
4. LeBlanc JM, Lalonde D, Cameron K, Mowatt JA. Tissue necrosis after propofol extravasation. *Intensive Care Med.* 2014 Jan;40(1):129-30. [PubMed] DOI: [10.1007/s00134-013-3137-z](https://doi.org/10.1007/s00134-013-3137-z)
5. Sharma R, Yoshikawa H, Abisaab J. Chemical burn secondary to propofol extravasation. *West J Emerg Med.* 2012;13:121-2. [PubMed] DOI: [10.5811/westjem.2011.6.6813](https://doi.org/10.5811/westjem.2011.6.6813)