

# Asymptomatic contrast medium extravasation

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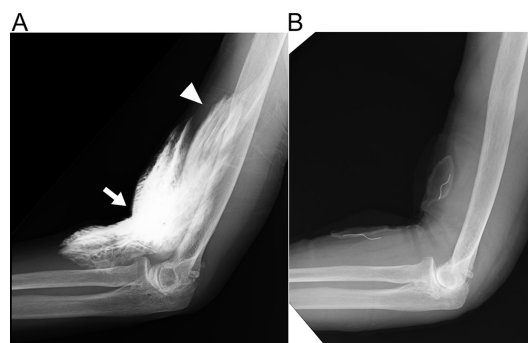
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## DESCRIPTION

A 72-year-old man was referred for a contrast-enhanced multidetector coronary CT examination. A physician tried to place an angiocatheter (BD Insyte Autoguard Winged, 20G, 1.1×25 mm) into the right median basilic vein; however, the vein could not be punctured correctly because it was difficult to detect owing to the tortuosity of the patient's vascular network. Therefore, the median cephalic vein was punctured. However, when the entire outer plastic tube was placed into the vein, the intravenous infusion failed to drop. When the outer plastic tube was pulled back by about 2 mm, the infusion was able to drop properly and the tube was fixed at that position. Before the infusion of contrast medium (CM), landiolol was injected through this catheter to reduce the patient's heart rate (HR). When the physician injected landiolol by hand, no resistance was felt and the HR of the patient was reduced from 81 to 73 bpm. Thereafter, 62 mL (4.7 mL/s) of CM was injected by using an automated injector (Nemoto, Dual Shot GX7). During the injection, the patient did not report any symptoms and the pressure monitor did not detect pressure higher than 13 kg/cm<sup>2</sup>, which is the upper limit of our protocol (figure 1A). The wave shape was only slightly different from that recorded from the same patient during an accurate infusion (figure 1B). As there was no contrast enhancement on CT, the physician examined the patient and found slight swelling in the arm. A simple radiograph of the right arm showed collection of CM in superficial soft tissues of the antecubital fossa and subfascial extravasation in the biceps muscle compartment (figure 2A). Although the patient did not have diabetes, a peripheral disease, or an impending skin necrosis, which are the usual indications for incision and drainage, he was referred to a dermatologist before his symptom and condition become worse. He underwent skin incisions and drainage of CM. The CM disappeared 1 day after drainage (figure 2B).



**Figure 2** Simple radiograph of the right arm. (A) Contrast medium (CM) in superficial soft tissues of the antecubital fossa (arrow) and subfascial extravasation of the biceps muscle compartment (arrowhead) were detected. (B) CM was undetectable 1 day after drainage.

The incidence of extravasation during contrast-enhanced CT with power injection is estimated to be 0.45%.<sup>1</sup> When extravasation occurs, patients usually experience symptoms such as pain, discomfort, numbness, burning sensation and stiffness in the injection site. In a previous study, 79% of patients had localised swelling after extravasation, 24% had pain, and 8% were asymptomatic.<sup>2</sup> The risk factors for CM extravasation depend on the injection technique and patient characteristics.<sup>3</sup> In this case, use of an automated injector, puncture of a suboptimal site, atrophy of the subcutaneous cellular tissue and fragile veins of the elderly patient were the risk factors. Interestingly, the pressure monitor of the automated injector could not detect the abnormal injection and the pressure wave was similar to that of a normal infusion.

This case report reminds clinicians about the risk of CM extravasation and of placing too much confidence in the use of a pressure monitor.

## Learning points

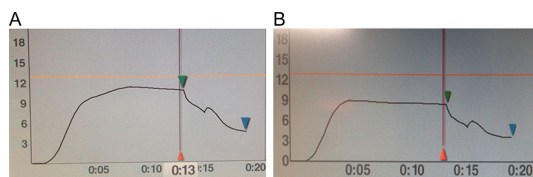
- ▶ Asymptomatic extravasation may occur when using an automated injector.
- ▶ The pressure monitor of an automated injector cannot always detect extravasation.

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**Contributors** YA collated information regarding the case and performed the needle puncture. SB treated this patient for extravasation. TS involved in the management of the case. YA and SH contributed to writing the manuscript. All authors have read and approved the final manuscript.

**Competing interests** None declared.

**Patient consent** Obtained.



**Figure 1** Pressure monitor results during infusion of contrast medium. The vertical axis shows the pressure (kg/cm<sup>2</sup>) and the horizontal axis shows the infusion time (s). (A) Pressure monitor results when extravasation was present. (B) Pressure monitor results in the same patient when extravasation was absent.



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