

Introduction

Infiltration and extravasation are known complications of IV fluid administration. Infiltration refers to the inadvertent leakage of non-vesicant, irritant fluid into surrounding tissues, while extravasation involves vesicant, potentially damaging cytotoxic fluids. Both can result in significant tissue injury if not promptly recognized and managed. The severity of injury depends on the volume and degree of toxicity of the infusate, ranging from mild localized swelling to limb-threatening compartment syndrome, requiring surgical intervention.

Extravasation of noncytotoxic agents is often underreported compared to cytotoxic agents and recommended management for these events can be unclear.

Case

- A 68-year-old male with a history of type 2 diabetes presented with 10/10 left arm pain following the administration of 500 mL of dextrose 10% solution through a left antecubital IV.
- The IV was removed during transport upon report of pain. Physical examination revealed a tense and swollen left upper arm with increased diameter compared to the contralateral side.
- To minimize further swelling, the patient was kept in an upright seated position and a finger traction device was applied to elevate the affected arm above heart level, promoting drainage.
- General surgery was consulted due to concern for possible progression to compartment syndrome, and the patient was admitted for overnight observation.
- By the following day, the swelling and pain had resolved without complication and patient was discharged.



Figure 1. Example of finger traction device used to maintain elevation of affected extremity in ED setting⁴

Risk Factors
High-volume infusion (>1000mL)
High osmolarity agent
Poor vein condition
Parasthesia, neuropathy
Impaired neurocognition or communication
Young children and elderly
IV site insertion across joint

Table 1. Risk factors of extravasation⁵

Discussion

- Extravasation events can cause life-threatening injury if severe.
- Management involves stopping the infusion immediately upon suspicion of injury, attempting aspiration from the IV using a small syringe before removing cannula, and elevating the affected extremity. The affected area should be marked in order to monitor and depending on severity, surgical consult can be considered [1].
- Dextrose 10% causes injury due to its high osmolarity and is classified as intermediate risk. Hyaluronidase can be administered if severe but is often not indicated. Use of warm compress can help disperse fluid throughout tissue. [2]
- Emphasis should be placed on proper IV placement, reduction of risk factors (Table 1), and site monitoring after IV medication administration to prevent extravasation injuries.
- Patients should be monitored during administration of IV medication for signs of extravasation such as induration, leakage, or pain. Patients should be informed of symptoms of injury and should report any pain or changes in sensation while receiving IV medication [3].

References

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