

## CLINICAL CHALLENGES

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### Mitoxantrone-Induced Extravasation

#### Case Study

V.H., a 53-year-old male with a diagnosis of progressive relapsing, remitting multiple sclerosis and a history of diabetes, presented to the clinic for his trimonthly dose of mitoxantrone (Novantrone®, Immunex, Thousand Oaks, CA) 12 mg/m<sup>2</sup> immunosuppressive therapy. A peripheral 22-gauge IV was started on the dorsum of the left hand and verified for patency by establishing a good blood return and checking for signs of infiltration. A 0.9% sodium chloride flush line was started followed by the one-hour piggyback mitoxantrone infusion. Thirty minutes into the infusion, the patient noted burning, pain, and swelling at the IV site. He informed the nurse of the symptoms immediately. The infusion was stopped promptly, and the supervising nurse and the patient's physician were notified. At the time of this event, mitoxantrone was labeled as an irritant at this ambulatory infusion center. In the case of extravasation, the protocol dictated that the infusion be stopped and ice applied immediately. In addition, V.H. was instructed to apply ice to the site for 48 hours with the arm elevated. At his next appointment, the patient denied pain at the infusion site although he had a 1 cm by 1 cm area of discoloration. Three months later, after intermittent therapy with antibiotics and topical ointments, the site had developed an eschar over a 2 cm by 2.5 cm area of underlying necrosis. A plastic

surgery consultation was obtained. The plastic surgery team monitored the necrotic site for another two months without intervention (see Figure 1). During this time, the lesion extended to a 3 cm by 3 cm area of necrosis mandating that V.H. undergo debridement and skin grafting to promote healing of the necrotic site (see Figure 2).

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#### Clinical Problem Solving

Responding to this clinical interview by Enza Luke, RN, MSN, OCN®, is Linda Person, RN, MSN, AOCN®, an advanced practice nurse at the University of Southern California/Kenneth Norris Comprehensive Cancer Center and Hospital in Los Angeles.

#### What are some of the most important factors associated with chemotherapy extravasation?

Numerous factors have been identified with the incidence of vesicant extravasation; among them are the skill of the nurse performing the venipuncture and the method used for administering the drug. Nurses should be trained in performing venipuncture and managing all types of venous access devices, and their skills should be assessed annually. The knowledge to administer vesicant agents safely and the expertise to prevent and assess extravasation must be validated by observation of behavioral performance (Camp-Sorrell, 1998). These standards of practice have been outlined clearly in the Oncology Nursing Society's chemotherapy and biotherapy guidelines (Brown et al., 2001). The most important of these skills are using the forearm, not the hand, to establish a peripheral line; administering the vesicant drug via a bolus push through a free-flowing IV line; checking for a blood return every 2–3 cc or hourly for continuous infusions through a central line; and securing the needle and all connections with tape. Inadvertent needle dislodgment



Figure 2. Patient Approximately Two Weeks Following Skin Graft

or migration may cause extravasation or infiltration.

Accessing veins in areas with decreased circulation or sensation should be avoided when administering any drug that can cause tissue necrosis if extravasated. Additionally, veins located in close proximity to superficial nerves and tendons should be avoided if possible. These areas include veins on

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Figure 1. Patient Approximately Five Months After Extravasation