

Severe burn injury associated with misuse of forced-air warming device

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To the Editor:

A 64-year-old male was admitted to our department with a third-degree burn on his left ankle. His medical history revealed type 2 diabetes of 12 years' duration and coronary bypass surgery 3 weeks previously. The patient claimed that he had noticed large blisters on his left ankle when he awoke from anesthesia after coronary bypass surgery. After detailed questioning it became evident that because the patient began complaining of cold after surgery, he was heated with a forced-air warming system. The nozzle of the device was not connected to the blanket, however, and hot air at 40–43°C was blown directly on to the patient's legs for nearly 2 h. On examination, a third-degree burn of 12 × 5 cm in size and surrounding hyperemia was documented (Fig. 1). His pedal pulses were absent bilaterally. The 10-g-Semmes–Weinstein monofilament test revealed

reduced sensation suggestive of diabetic peripheral neuropathy. The patient required 3 months of wound care and hyperbaric oxygen therapy to heal the wound.

Forced-air warming is one of the most frequently used methods of patient warming in the operating room [1]. This device comprises an electrical heater unit, a hose, and a blanket. Hot air generated by the electrical heater is transferred to the blanket via the hose. Burn injuries associated with forced-air warming systems are extremely rare when the device is used according to the manufacturer's instruction [2]. However, improper use of the devices exposes patients to a considerable risk of burn injury [3]. Moreover, even if the device had been used adequately, the connection could have come off accidentally. General misuse of this system is detaching the hose from the blanket and blowing hot air directly on to the patient's skin. This practice is called "hosing". Hosing causes concentration of hot air at a single spot for an extended time period. Although a few cases including a severe burn injury of lower extremities have been reported [4], the dangers of "hosing" are not known by everyone. The Food and Drug Administration has issued a warning and requested submission of hosing-associated hazards [5]. In addition, one of the manufacturers has started a campaign by posting a website (<http://stophosing.com>) to inform clinicians about the dangers of the use of forced-air warming units without blankets [4].

Our patient had both diabetic angiopathy and sensory neuropathy. We think that diabetes also increased the risk of burn injury in our patient. Diabetic angiopathy and neuropathy makes skin more vulnerable to injuries. Because of diabetic sensory neuropathy in his lower extremities, the patient did not perceive the temperature of the hot air correctly and hence could not warn the technician to stop hosing.

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Fig. 1 Third-degree burn injury on patient's left ankle

This case taught us two things. First, forced-air warming units should always be used with a blanket in accordance with the manufacturers' instructions. Second, healthcare

professionals who care for diabetic patients should keep in mind that diabetic patients are prone to thermal injuries because of diabetic angiopathy and sensory neuropathy. Last, but not least, burn injuries caused by improper use of forced-air warming devices can expose health institutions and physicians to medico-legal liability.

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