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Subdermal Fluid for Skin Protection during Superficial Palliative Thermal Ablation

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Editor:

Radiofrequency (RF) ablation is increasingly being used to treat small tumors of the liver, breast, kidney, adrenal, and bone in addition to tumor debulking. RF ablation has been successful in the treatment of painful metastatic bone disease and has more recently been described for palliation of soft tissue cancer pain (1-3). Although a rare complication, skin burns from RF ablation have been reported during the tract-ablation portion of the procedure, along the edge of grounding pads, and from the insulating coating surrounding the needle being peeled off (4-6).

A 23-year-old man with sarcoma presented for RF ablation for pain palliation of three rapidly enlarging soft tissue masses in the right subscapula, right chest wall, and left flank. The lesions were hypoechoic on ultrasound, and the needle had free motion within the lesion suggesting a cystic component or necrosis which can make the heating process during ablation difficult and longer (7).

Due to the extremely superficial location of the lesions just under the skin and the potentially longer ablation time, the risk of skin burn was considered significant. As a result, 20 mL of 1% lidocaine was used as an anesthetic and more important, to insulate the skin and move the masses away from the skin by injecting in a subdermal location. The 3.8 cm × 3.5 cm right subscapular mass was ablated first. Before ablation, the distance between the skin surface and the superior margin of the tumor was 0.52 cm (Fig 1). After injection of 20 mL of 1% lidocaine, this distance increased to 1.14 cm (Figs 2-3). The ablation was then performed without complication or evidence of skin burn. The same technique was also applied to the other two lesions on the chest wall and flank. We commonly use a similar technique to prevent diaphragmatic injury for those perihepatic tumors close to the diaphragm and adjacent organs (8).

While we cannot recommend a minimum distance from the tumor to the skin that would prevent burn injury, in our own experience fluid protection is warranted when either two organs (ie, bowel and liver) or tumor and skin are less than 1.0 cm from each other. This simple maneuver may decrease the risk of ablating tumors that are very close to the skin surface and have the potential to result in significant burn injury during the heating process. The recommended minimum distance between skin and a vein being laser ablated is 10 mm (9), which supports the 10 mm threshold, but it may be an arbitrary number. However, further prospective study to determine the minimum distance to prevent skin burns and to confirm the safety of this approach is required.

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Figure (1).
Soft tissue sarcoma mass 0.52 cm beneath the skin surface.

Figure (2).
Needle (arrow) during subdermal injection of 20 mL of 1% lidocaine.

Figure (3).
Increased distance between skin surface and tumor after injection of lidocaine.