

## Scalp burns from halo pins following magnetic resonance imaging

### Case illustration

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We report on the first case of a scalp burn from halo pins as a complication of magnetic resonance (MR) imaging. (Note that other patients at our institution have complained of a focal heating sensation at halo-pin sites during MR imaging.) A 58-year-old man with a cervical epidural abscess underwent an anterior cervical corpectomy and allograft fusion with cervical plating. Postoperatively, the patient was placed in a titanium six-pin halo-vest fixation device and underwent cervical MR imaging in a 1.5-tesla magnet. Afterward, burn marks were evident on the scalp at the right two posterior pins (Fig. 1). The stoic patient had clearly perceived significant burning pain during MR imaging, but did not notify the technicians.

Electrical current, radiofrequency energy, and microvibrational energy are plausible generators of heat during MR imaging.<sup>2-4</sup> As a halo pin transmits this energy to the skin, it is perceived as a heat sensation. Enough energy was produced to burn the patient's scalp in our case. The cause of MR imaging-related burns from halo pins and other medical devices is unknown but has been attributed to monitoring equipment and even skin tattoos.<sup>1,5</sup> Physicists and engineers must define the mechanisms that produce thermal injury so that preventive measures can be instituted. Theoretically, insulating any conductive pathways within the halo device at its interface with the patient's scalp should alleviate this problem. At our institution, a prototype of a nonconductive pin has caused no instance of burning or discomfort at the pin site during MR imaging.

### Disclosure

No medical doctor who has authored this study receives compensation from Jerome Medical or Hanger Prosthetic and Orthotics; however, Jeffrey Nemeth is employed by Hanger Prosthetic and Orthotics, and Lisa Tweardy is employed by Jerome Medical.

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FIG. 1. Photograph of MR imaging-associated scalp burns at the two right posterior pins in the six-pin halo construct. Note the evidence of an old pin site (left side).

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