What’s New in MRI Hazards?

Two issues have recently come to light concerning magnetic resonance imaging (MRI) hazards. The U.S. Food and Drug Administration (FDA) has received reports of patients with second- and third-degree burns on skin under electrocardiogram (EKG) electrodes attached to cables. These burns were noted after the patients underwent MRI. Some burns were serious enough to require plastic surgery.¹

Even if the EKG electrodes and cables are MRI compatible, radiofrequency fields occurring during MRI may heat the electrodes to the point where they produce burns on patients. This is more likely to occur when the electrodes are not in complete contact with the skin surface. The resulting air gap disrupts the electrical pathway, producing a build-up of heat at the electrode’s center or a current arc from the electrode to the skin.¹

Another hazard was identified in a report recently submitted to PA-PSRS. An MRI procedure was immediately discontinued when a metal artifact was noted on the images. Upon further patient interview, it was discovered that the patient had previously undergone a procedure involving ingestion of a PillCam™ (i.e., capsule endoscopy). The PillCam had not passed from the patient’s gastrointestinal system prior to the MRI. The MRI was stopped before the patient sustained any injury.

Patient Safety Strategies

The following tips may reduce the risks associated with these hazards.

- Include on an MRI screening checklist questions concerning the following:
  - PillCams: date of use; date passed from gastrointestinal system
  - Electrodes/cables: whether MRI compatible; methods used to completely affix to skin

- During the MRI, closely observe the images for unexpected metal objects, and immediately stop the procedure if such objects are noted on the images.

- Use MRI-compatible electrodes and cables.¹

- Do not use electrodes after their expiration date.¹

- Search in clothing, sheets and covers, and on the patient for electrodes and cables and remove these devices when they are no longer needed for patient monitoring.¹

- Affix electrodes completely to the skin surface by drying the area, removing excess hair, and avoiding air gaps.³

- Do not loop cables; keep a blanket between the patient’s skin and cables.¹

- After the MRI, assess the patient for skin integrity issues at electrode sites.¹

- If a burn/injury occurs:¹
  - Treat according to prescriber’s orders.
  - Document the occurrence in the medical record.
  - Report to/notify appropriate departments of the occurrence.
  - Sequester the equipment involved, according to facility policy, for evaluation by biomedical engineering department and/or the manufacturer.

Note


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