ABSTRACT

Magnetic resonance imaging is considered to be a reasonably safe diagnostic assessment too. This only holds true when safety precautions are followed. When an oversight does occur the result can range from minor injury to irreparable harm to either the patient or personnel working close to the scanner. One such complication associated with magnetic resonance imaging is thermal burn injury.

BACKGROUND

A 12 year old patient was admitted secondary to weeks of intermittent fevers and rash. The patient had a complex medical history that included a diagnosis of William’s syndrome. Manifestations of the syndrome in this patient included supravalvular aortic stenosis, hypertension, impaired cognition and severe anxiety. Co-existing problems included cyclic vomiting syndrome and feeding dysfunction that required total parenteral nutrition. Her hypertension was difficult to manage and she was scheduled for an MRA/MRI of the kidneys to rule out renal artery stenosis, a possible complication secondary to William’s syndrome. Due to her complex medical history general anesthesia was determined to be the safest route. A careful inhalational induction was performed. Prior to entrance into the scanner, as per protocol, the patient and her clothing, which consisted of a hospital gown and an ace bandage, were superficially inspected for any metal or conducting objects. The ace bandage was wrapped around her chest and back covering her central line. This had been done to prevent the patient from continuously picking at it. A hand-held ferromagnetic detection instrument was used to confirm the absence of metallic items. The MRI scan was uneventful. Upon emergence from anesthesia the patient was found to be hypertensive and extremely agitated. As this was not far from her baseline she was provided with analgesic medication for comfort. Once the effects of anesthesia diminished she was still hypertensive and agitated. Her parents confirmed that her current condition was a change from her baseline. Several hours after the scan the patient’s ace bandage was removed for closer inspection of the central line. Underneath the bandage, an ECG lead was found on her right upper back. Beneath the lead was a two by two centimeter full thickness burn.

MR Thermal Burn

SafeScan® Target Scanner™

Thermal Injuries Trend

IU MRI Safety Time Out

SafeScan Target Scanner Role: A sensitive ferromagnetic detection product when positioned closely to threat object. The signal being detected by any ferromagnetic detection system diminishes as the cube of the distance.

The target scanner is properly used as a double-check device safety precaution after the patient has been medically cleared to enter the magnet zone.

MR thermal injuries were on an upward trend as reported by the FDA and may have been due to dramatic increase in the number of MR procedures. In February 2008 the Joint Commission highlighted increasing patient safety issues with MR imaging by releasing a Sentinel Event Alert. ECRI cited MR imaging-related thermal injuries among its 2010 top 10 list of technology hazards

There is an increasing trend towards the use of checklists in hospitals with multiple studies demonstrating a decrease in complication rates. Although useful checklist content needs to be routinely reviewed and evaluated.

CONCLUSIONS

Most of the adverse events that occur in practice are not due to equipment or system malfunction, but to improper patient management. All members of the clinical team must play a roll in preventing these adverse events. Special attention needs to be paid to pediatric and nonverbal patients who are unable to communicate pain or discomfort. In the setting of a burn injury signs may not present immediately leading to delayed diagnosis and treatment. Recent trend has shown a decrease in thermal injuries, possibly due to increased awareness along with reevaluation and revision of existing protocols.

REFERENCES