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Magnetic Resonance Imaging in Cochlear Implant Patients without Magnet Removal: A Safe and Effective Workflow Management Program

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Abstract : Background Cochlear implants (CIs) are currently the primary effective treatment for severe or profound sensorineural hearing loss. As China's population ages and the number of young children rises, the demand for MRI for CI patients is expected to increase. Methods Reviewed MRI cases of 25 CI patients between 2015 and 2024, assessed imaging auditory outcomes and adverse reactions. Use the adverse event record sheet and accompanying medication sheet to record follow-up measures. Results Most CI patients undergoing MRI may face risks such as artifacts, pain, redness, swelling, tissue damage, bleeding, and magnet displacement or demagnetization. Twenty-five CI patients in our hospital were reviewed. Seven patient underwent 3.0 T MR, the others underwent 1.5 T MR. The manufacturers are 18 cases in Austria, 5 cases in Australia and 2 cases in Nurotron. Among them, one patient with bilateral CI underwent 1.5 T MR examination after head pressure bandaging, and the left magnet was displaced (CI24RE Series, Australia). This patient underwent surgical replacement of the magnet under general anesthesia. Six days after the operation, the patient's feedback indicated that the performance of the cochlear implant was consistent with the previous results following the reactivation of the external device. Based on the experience of our hospital, we proposed the feasible management scheme of MRI examination procedure for CI patients. This plan should include a module for confirming MRI imaging parameters, informed consent, educational materials for patients, and other safety measures to ensure that patients receive imaging results safely and effectively, implify clinical. Conclusion As indications for both MRI and cochlear implantation expand the number of MRI studies recommended for patients with cochlear implants will also increase. The process and management scheme proposed in this study can help to obtain imaging results safely and effectively, and reduce clinical stress.

Keywords : cochlear implantation, MRI, magnet, displacement
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