both T_1 and T_2 spin echo sequences is characteristic (as in our patient) of methemoglobin in extracellular location. The heme iron is in the ferric state (Fe^{+++}), causing shortening of T_1, and surrounded by water molecules, causing elongation of T_2. This MRI behavior of hematomas can be present from a few days until several weeks after the sudden bleeding phenomenon, a condition often encountered in clinical practice. This type of signal is pathognomonic of organized hematomas in the late subacute phase.

We managed bilateral proptosis with subperiosteal orbital hemorrhage conservatively, based on a lack of eyelid ecchymosis, palpable lesion, and laboratory findings. The corneal exposure was treated while anticipating other options. One can argue that blood aspiration might accelerate resolution; however, with an uncertain diagnosis, it is considered unwise to insert a needle in an orbit. Magnetic resonance imaging scans are helpful in making the diagnosis of subperiosteal hemorrhage, and conservative management is advised.

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Hyphema Caused by a Metallic Intraocular Foreign Body During Magnetic Resonance Imaging

Christopher N. Ta, MD, and R. Wayne Bowman, MD

PURPOSE: To report a 63-year-old man with a retained intraocular foreign body who developed a hyphema during magnetic resonance imaging (MRI) of the brain.
METHODS: Case report and review of the current literature on ocular injury caused by intraocular foreign bodies when subjected to an electromagnetic field.
RESULTS: Our patient underwent a brain MRI, and the intraocular foreign body caused a hyphema and increased intraocular pressure. The presence and location of the intraocular foreign body were determined by computed tomography (CT).
CONCLUSION: Magnetic resonance imaging can cause serious ocular injury in patients with ferromagnetic intraocular foreign bodies. This case demonstrates the importance of obtaining an occupational history, and, when indicated, a skull x-ray or CT to rule out intraocular foreign body before an MRI study. (Am J Ophthalmol 2000;129:533–534. © 2000 by Elsevier Science Inc. All rights reserved.)

A 63-YEAR-OLD MAN WHO UNDERWENT A HEART TRANSplant 11 months prior to admission presented with a 5-day history of fever, headaches, and change in mental status. A brain magnetic resonance imaging (MRI) study was obtained. Immediately after the MRI, the patient complained of sudden pain and loss of vision in the left eye that occurred while he was in the MRI scanner. The patient was a metal worker but denied any intraocular injury.

On examination at the bedside after the MRI, his visual acuity with a near card (with correction) was RE: 20/30 and LE: counting fingers at 3 inches. The intraocular pressure was RE: 12 mm Hg and LE: 30 mm Hg. His right pupil was reactive. His left pupil was minimally reactive at 6 mm. No afferent pupillary defect was detected. Examination of the right eye was normal except for a moderate cataract. The left eye had a 2-mm paracentral corneal scar and a 50% hyphema. The lens had moderate nuclear sclerosis. Fundus examination revealed an attached retina with no vitreous hemorrhage.

A metallic intraocular foreign body was suspected. An orbital computed tomography (CT) scan revealed a radiodense intraocular foreign body in the inferior anterior chamber in the left eye (Figure 1). The right orbit had a foreign body just outside the globe in the inferior temporal quadrant (Figure 2).

Treatment included bedrest, elevation of the head of bed 30 degrees, scopolamine, prednisolone acetate, timolol, and brimonidine. By hospital day 5, the left eye had an intraocular pressure of 14 with a 1-mm blood clot and retinal flame hemorrhages. There were also scattered subconjunctival hemorrhages in both eyes. Unfortunately, our patient developed multiorgan failure and died. The cause of death is unknown, but sepsis or thrombocytopenic thrombotic purpura was suspected.

Several studies show that ferromagnetic bodies have significant movements when subjected to MRI, with the potential to cause intraocular injury. Lagouros and associates showed that all ferromagnetic materials (such as a BB pellet, a staple, or a screw) move during an MRI study in vitro when suspended in gelatin.[1] Three of four ferromagnetic bodies implanted in the vitreous of rabbits showed movement that caused retinal holes, detachment, and

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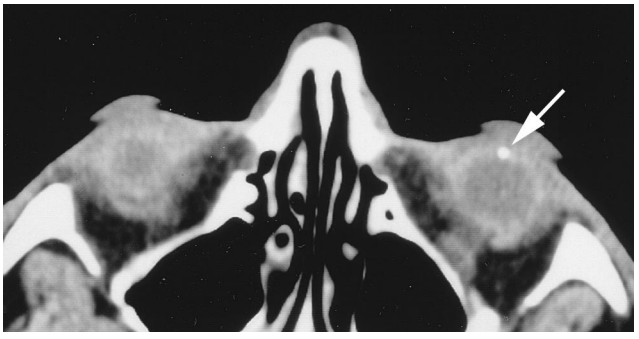

FIGURE 1. Orbital computed tomography shows a radiodense intraocular foreign body (arrow) in the anterior chamber of the left eye.

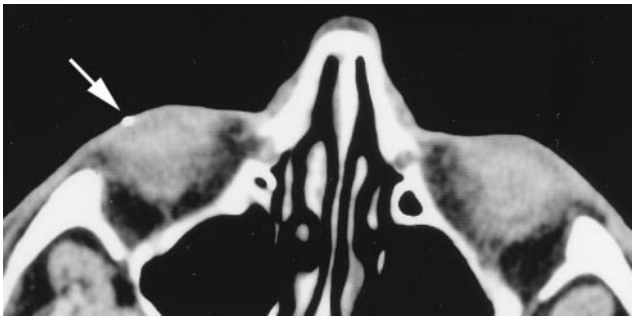

FIGURE 2. Orbital computed tomography shows a radiodense extraocular foreign body (arrow) in the inferior temporal quadrant of the right orbit adjacent to the globe.

dialysis.[1] The most recent study by Gunenc and associates demonstrated that implanted iron, chromium, and solder foreign bodies can move 7 to 10 mm inside bovine eyes during an MRI procedure.[2] In contrast, two published studies by Williams and associates[3] and Williamson and associates[4] did not show a high potential risk for ocular injury with ferromagnetic materials and MRI.

Our case demonstrated that serious ocular injuries can occur in patients with metallic intraocular foreign bodies who undergo MRI studies. Kelly and associates[5] reported a similar case that resulted in a vitreous hemorrhage. Both these reports stress the importance of obtaining a detailed occupational and surgical history before performing MRI studies. When indicated, an x-ray or CT with overlapping cuts should be considered to rule out an intraocular foreign body before an MRI study.

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Markedly Increased Unilateral Intraocular Pressure During Hemodialysis in a Patient With Ipsilateral Exfoliative Glaucoma

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PURPOSE: To report a man with markedly increased intraocular pressure in a unilateral exfoliated eye during hemodialysis.
METHOD: Case report.
RESULTS: A 75-year-old man with unilateral exfoliative glaucoma complained of blurred vision in his right eye during hemodialysis. The blurred vision always occurred during hemodialysis, and the intraocular pressure was increased during hemodialysis. The average increase in intraocular pressure during hemodialysis in the right eye was 22.5 mm Hg, and the intraocular pressure in the left eye remained in the normal range during hemodialysis. Argon laser trabeculoplasty was performed on the right eye, and a decrease in intraocular pressure was attained.
CONCLUSION: Physicians must be alert to intraocular pressure increases in these eyes during hemodialysis.

HEMODIALYSIS IS USED TO TREAT PATIENTS WITH SEvere renal failure, and various complications are associated with the procedure.[1–3] We describe a patient with unilateral glaucoma who developed markedly increased intraocular pressure in the ipsilateral eye during hemodialysis.

A 75-year-old man complained of blurred vision in his right eye during hemodialysis. He had renal failure and was undergoing hemodialysis three times weekly for 2 years. On examination, the corrected visual acuity levels were RE: 20/30 and LE: 20/25. The intraocular pressure measurements were RE: 56 and LE: 15 mm Hg. The right

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