Pantopaque on MR.

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Letters to the Editor

MR of Hemorrhage

A recent article by Edelman et al. [1] describes how acute hemorrhage can be imaged at moderate field strengths owing to the magnetic susceptibility effects of deoxyhemoglobin, which are more readily detected when using gradient echo techniques. We have recently developed a new class of superparamagnetic MR contrast material that has magnetic susceptibility effects that mimic, but are much more potent than, those predicted in acute and chronic hemorrhage (due to hemosiderin) [2]. In evaluating the contrast material (which consists of particulate iron oxide) with a magnetometer, we showed that the magnetic moment and, therefore, the magnetic susceptibility increased logarithmically with increased applied external field. Magnetization is most pronounced from 0.6 to 0.9 T; above 0.9 T only a modest increase (approximately 10%) is achieved with any further increase in external field strength. These data both predict and support the observations of Edelman et al. regarding the ability to image magnetic susceptibility changes at moderate field strength, and they also suggest the potential efficacy of contrast material that relies on magnetic susceptibility effects at a broad range of field strengths. Our data are based on particulate iron that is 150–250 Å. However, the different iron moieties involved in hemorrhage will each no doubt have a characteristic magnetic susceptibility profile at various field strengths.

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Risk of Ferromagnetic Ocular Foreign Bodies in MR

An article in *AJNR* [1] points out the risk of ferromagnetic ocular foreign bodies in MR imaging. We have recently encountered two patients with remote cataract surgery in whom the lens prosthesis is implanted by a metal stave. In these patients, a platinum wire extending 1–2 mm from the superior edge of the lens functions as a clip, anchoring the lens through an iridectomy. This type of cataract repair (Worst Platina IOL [2]) was once a commonly used form of cataract prostheses that has given way to nonmetallic staves. Platinum is mildly paramagnetic, having a low magnetic moment [3]. Therefore, these patients can be imaged without risk of disruption of the lens or possible complications, as discussed in the article by Kelly et al. [1]. To our knowledge, no previous mention has been made in the radiologic literature of the risk of studying postcataract patients with this method, and no complications have yet been reported. Patients who have had remote cataract surgery and ophthalmologists who have performed these procedures often have no ready recollection or documentation of the type of cataract implant used. Review of the ophthalmology literature suggests that the metal used in ocular implants appears safe for MR imaging. Study of the torque force exerted on the lens implant at various field strengths would be of interest to confirm these expectations.

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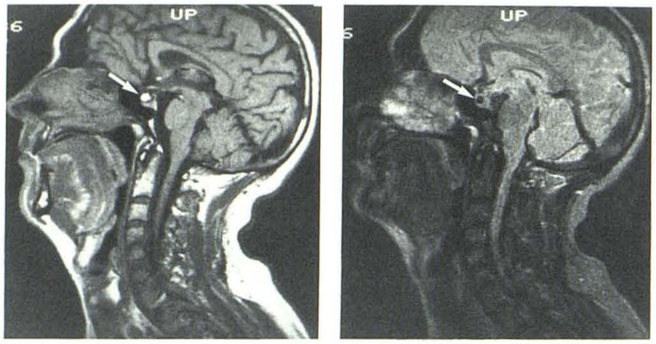
Pantopaque on MR

In reading the paper by Braun et al. [1] about MR of Pantopaque, we were surprised to find that Pantopaque did not fit the authors' limited definition of an MR contrast agent. In a review of MR contrast enhancement, Brasch [2] used a broader definition that included other agents besides paramagnetic compounds. He specifically mentioned lipids, and cited animal work with mineral-oil enhancement of bowel loops. Pantopaque clearly increases the contrast between the cortical bone of the spinal canal and the subarachnoid space on T1-



A B

Fig. 1.—Area of increased signal (*arrow*) was seen in sella on TR = 500 TE = 30 msec image (*A*), which is seen as relatively low signal (*arrow*) on TR = 2500 TE = 80 msec image (*B*). CT scan showed Pantopaque in sella.

weighted images. In our paper [3] we included images of a patient with metastatic disease to the spine in which Pantopaque was helpful in demonstrating compression of the spinal canal. While we agree that the definition used by Braun et al. reflects the popular view on the subject, we feel it is quite premature to limit the definition in this fashion. Certainly, conventional radiology embraces a variety of contrast agents, including air, barium, and iodine, without too much semantic quibbling.

In their conclusions, the authors limit their remarks to intraspinal Pantopaque. We would like to emphasize that Pantopaque may be confused with fat or hemorrhage anywhere in the subarachnoid space. It is particularly important to understand the T1 and T2 properties of Pantopaque when it appears in unexpected places (Fig. 1, above).

Finally, the authors suggest in their introduction that they "discovered" these properties of Pantopaque and that they "were subsequently reported by Mamourian and Briggs." We would like to point out that they presented their results at the RSNA 5 months after our article was submitted to *Radiology*, as the printed submission data attests. It is difficult to understand how the authors presume to claim this observation with this chronology in mind.

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Reply

We would like to assure Mamourian and Briggs that it was not our intent to "prematurely limit the definition" of an MR contrast agent. We simply opted for the "popular" (most widely accepted) definition of an MR contrast agent in the hopes of providing a clear and unambiguous presentation, without getting distracted with a discussion that is really not germane to the essence of the study—namely, the behavior of Pantopaque on MR.

We appreciate the authors pointing out to us that Pantopaque has similar relaxation characteristics anywhere in the subarachnoid space, including inside the cranial vault. Finally, nowhere in our manuscript do we say we were the first to discover this phenomenon. In addition, if the authors would like to quibble about dates of submission of abstracts or articles, we would like to remind them that the deadline for abstracts submitted for presentation at the 1985 RSNA was April 26th two months before the submission of their article.

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Use of Coils for Transcatheter Carotid Occlusion

I agree with Braun et al. [1] in their proposed use of coils for transcatheter carotid occlusion. We have similarly treated a 30-year-old-man with a giant, unruptured, partially thrombosed fusiform aneurysm of the cavernous segment of the right carotid artery that was considered unsuitable for surgery [2]. After an uneventful, long-lasting temporary closure of the right internal carotid artery by a non-detachable balloon catheter, and with monitoring of clinical and EEG findings, a small Gianturco coil was released 8-cm distal to the origin of the artery, followed by a second "security" coil, which resulted in complete closure of the aneurysm (Fig. 1). The postoperative course was uneventful and the cavernous sinus syndrome disappeared almost completely during the next 5 months. Angiographic controls (Fig. 2) confirmed exclusion of the aneurysm from the circulation, thrombosis of the right internal carotid artery with sparing of the ophthalmic artery, and complete vascularization of the right hemisphere by the left carotid artery through hypertrophied right anterior

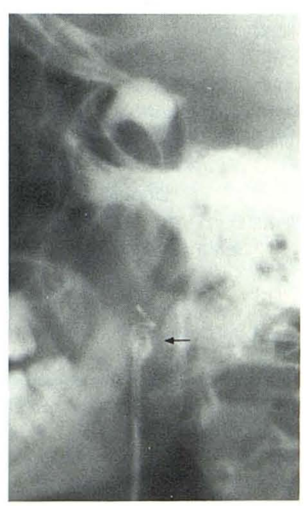

Fig. 1.—Small Gianturco coil (*arrow*) released 8-cm distal to origin of artery followed by second "security" coil resulted in complete closure of aneurysm.

Fig. 2.—Angiographic controls confirm exclusion of aneurysm from circulation.