Case Reports and Technical Notes

An Unusual Metallic Foreign Body Within the Brain

Case Report

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The human race over the centuries has acquired a considerable capacity for successfully introducing foreign bodies into various body cavities through the many available orifices. Hamilton Bailey's statement with regard to one orifice, "the variety of foreign bodies which have found their way into it is hardly less remarkable than the ingenuity displayed in their removal," is very true. The successful self-introduction of a foreign body into the cranial cavity is more than usually difficult as it is a "closed box" and no ready means of ingress is available. But here, too, human ingenuity seems to have triumphed, as shown by the following case history.

Case Report

A young man, aged 19 years, was admitted to the Miraj Medical Center, India, in August, 1965, with a history of headache, vomiting, and low-grade pyrexia of 1 month's duration.

Examination. The patient was a vacant-faced youth of low intelligence who smiled often, in a fatuous manner. He was normally alert and complained of headache and neck pain. He exhibited marked neck stiffness. Neurological examination was normal, although it was difficult to hold his attention for long. The cerebrospinal fluid contained 278 cells/cm, of which 90% were polymorphonuclear and 10% lymphocytes; the CSF sugar content was 25 mg/100 cc and the protein content 75 mg/100 cc.

A provisional diagnosis of tuberculous meningitis, which is very common in India, was made, also because the boy had had some form of antibiotic therapy before hospitalization. A closer examination of the patient's skull revealed a depressed scar, about 1 inch in length, just behind the hair line to the left of the midline of the skull. A routine skull x-ray film (Fig. 1) revealed two linear foreign bodies near the midline of the skull, one stopping short in the substance of the brain at a depth of 5 cm. The other was nearby but traversed the brain and appeared to be lying with its deeper end in the interpeduncular region.

This surprising finding prompted a further inquiry into the patient's past habits. It was now elicited that, for the past 3 years, the patient had been in the habit of inflicting wounds to his head. He had been observed to beat his head with stones; he could offer no explanation as to why he was doing it, and would resent interference. The wounds had always healed after local treatment by a general practitioner. About 2 months before admission, the patient told his father that he had inserted three metal wires into his head, and, indeed, one was seen to be protruding from a wound in the scalp. The family physician had removed the protruding wire, and the wound had healed. Not unnaturally, the patient's assurances that two more wires were still in place were not taken seriously. Shortly afterward, he began to complain of headache and neck pain and ran a low-grade fever which was treated by various antibiotics. The failure of the symptoms to resolve brought about the patient's admission to hospital.

It was now clear that this was a case of purulent meningitis, the infection having been introduced by the metal wires. A brain abscess was not considered likely in the absence of focal neurological signs and normal optic discs. It was decided to attempt the removal of the wires, as the shorter of the two lay just at the level of the inner table of the
skull under the bony defect engineered by the patient's own efforts. No difficulty was anticipated in finding this superficial wire, and it was felt that this would lead to the second and longer one, which was lying parallel to and in contact with it.

Operation. On September 3, 1965, a small left frontal bone flap was raised, incorporating the patient's own "burr hole" in the flap. Scar tissue was present under this hole and tethered the dura to the brain at this point. The dura was carefully opened to expose the superomedial border, and the fibrous track in the brain lying just lateral to the superomedial border of the frontal lobe was easily identified. However, there was no sign of the wire. The frontal lobe was carefully retracted medially and the falx and corpus callosum exposed. The wire still was not seen. A small core of brain tissue was then excised over the fibrous track, and the track explored gently with suction and irrigation. Just as we were about to give up, one wire was seen at a depth of nearly 5 cm. This proved to be the shorter of the two. As this one had migrated so far away from the expected place, possibly due to the surgical interference, it was feared that the longer one might be pushed further downward in the attempt to locate it, with fatal transfixion of the brain stem. The attempt was therefore terminated and the wound closed. The patient regained consciousness promptly, and there was no neurological deficit.

Postoperative Course. Antibiotic therapy in the form of crystalline penicillin, 1 million units, 6 hourly, and streptomycin 0.5 gm 12 hourly, were given for the next 14 days. Serial lumbar punctures showed a steady fall in the cell count, and by September 14 the CSF was virtually normal, with 9 cells/cm and a protein count of 60 mg/100 cc. Clinically the patient was well.

Ten days later (October 5) frontal headache and neck stiffness returned. The CSF now contained 58 cells/cm with 63% polymorphonuclear cells, a sugar count of 62 mg/100 cc, and a protein count of 175 mg/100 cc. Next day a right frontal burr hole was made under local anesthesia; the right lateral ventricle was punctured and 40 ml of air exchanged for CSF. The ventriculogram showed dilated lateral and third ventricles which, however, were not displaced (Fig. 2). No air was seen in the fourth ventricle, and the appearance of the third ventricle suggested that the aqueduct was obstructed. The ventricular fluid was not under pressure, however, and the true significance of the roentgenograms was not appreciated. The ventricular fluid contained 64 cells with 75% polymorphonuclear cells and 100 mg of protein. After 2 weeks of reinstituted antibiotic treatment, the patient's temperature crept down to normal and his headache vanished. However, serial CSF cell counts continued to show figures ranging from 66 to 200. All antibiotics were withdrawn at this