

A 95-year-old man with Alzheimer's disease and diabetes mellitus was admitted because of a non-syncopal fall resulting in a head injury while in the toilet. On physical examination, his Glasgow Coma Scale score was 14/15 (eye 4, verbal 4, motor 6) and no external injuries or focal neurological deficit was evident. Cardiovascular, respiratory, and abdominal examination findings were unremarkable. Plain computed tomography (CT) of the brain was performed (Fig 1). His blood glucose concentration was normal.

Question 1: What is the abnormality in the computed tomographic brain?

A foreign body with metallic density was situated within the body of corpus callosum. A metallic foreign body in the brain could be either a projectile or a surgical implant, eg surgical clip. In our patient, however, the shape was not suggestive of a surgical clip. We therefore needed to re-inspect the CT brain for evidence of previous surgery, or a projectile entry site or parenchymal brain injury. On careful examination of the CT, bony fragments were evident beneath the inner table of the right parietal bone and hypodensities can be discerned within the parietal lobe of the brain (Fig 2), indicating the previous route of entry of a foreign body.

Question 2: Could any further history and/or physical examination be helpful?

To explore whether this foreign body was related to a current or remote injury, the patient's head was re-examined but yielded no features of an external injury. According to the relatives, there was no history of prior neurosurgical procedures but one of them recalled that the patient had talked about having survived a gunshot injury in his 20s (during World War II), but nobody believed his 'story'. The foreign body was therefore unrelated to his current fall. On physical examination of this right-handed patient, features of possible parietal lobe dysfunction (sensory or visual inattention, construction or dressing apraxia, spatial neglect and inattention, lower quadrantic hemianopia and astereognosis) were looked into, but none were present.

Question 3: What potential complications could arise from this abnormality?

A retained bullet in brain parenchyma has been associated with complications that could present after days, months, or years and include: brain abscess, migration of the bullet¹ and lead poisoning.^{2,3} Migration of the bullet may ensue due to gravity or abscess formation (with adjacent tissue softening).¹ Lead poisoning could present with anaemia,

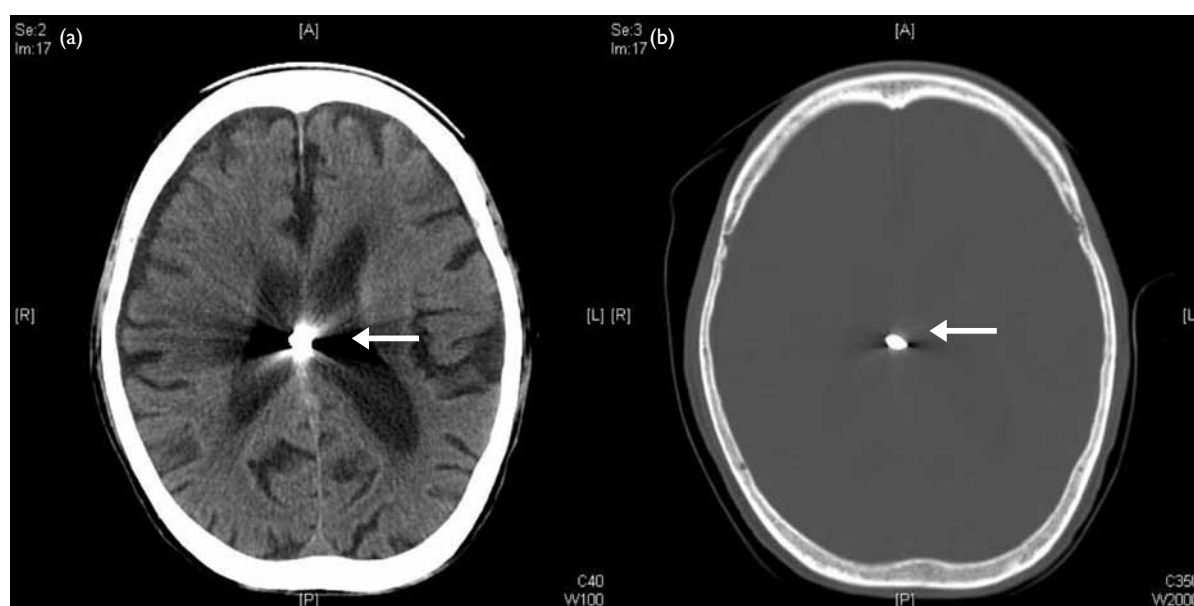


FIG 1. Computed tomographic brain images

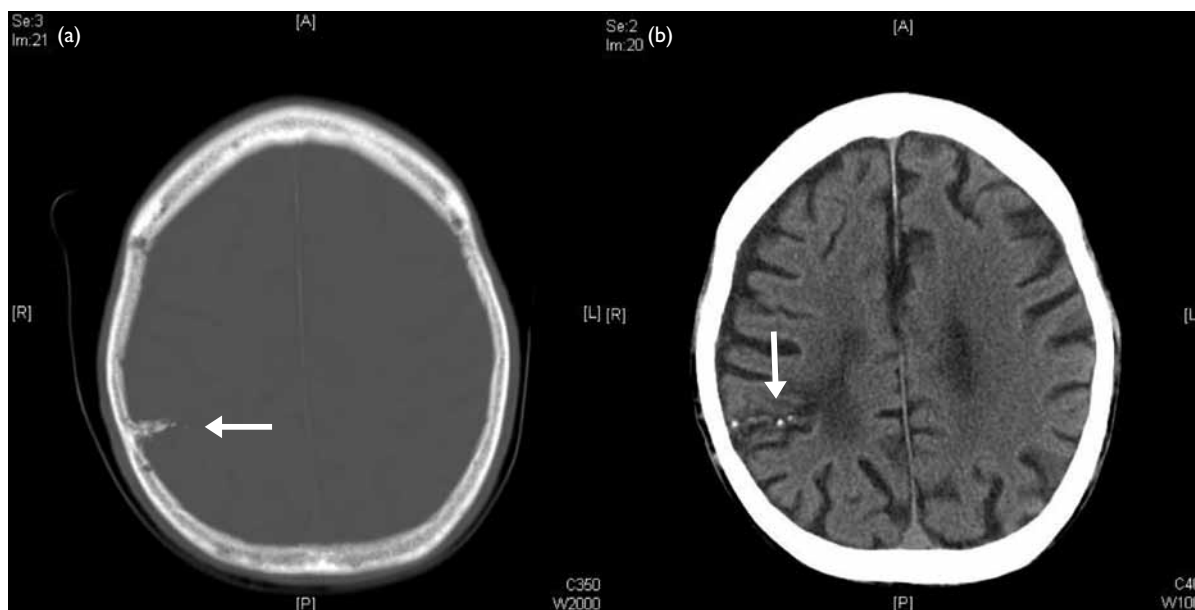


FIG 2. Computed tomographic brain images also noted bony fragments beneath inner table of the right parietal bone and hypodensities within the parietal lobe of the brain, indicating the previous route of entry of the foreign body

abdominal colic, nephropathy, encephalopathy and motor neuropathy,² but in this patient the blood lead level was normal. The absence of lead poisoning in our patient was likely due to lack of contact of the bullet with cerebrospinal fluid, which presumably avoided systemic absorption of lead.³

This case also highlights paying attention to a history of gunshot injury before proceeding to magnetic resonance imaging (MRI). Less than 20% of bullets are powerfully ferromagnetic, others weakly ferromagnetic, and others nonferromagnetic.⁴ It has even been suggested that the MRI properties of any type of bullet be tested using pig carcasses, before subjecting any patient with a retained bullet to MRI.⁵ However, in this instance the type of bullet embedded in this patient could not be determined. In practical terms it is therefore necessary to ask about any history of gunshot injury before proceeding to MRI examination.

Outcome of the patient

Given the advanced age of the patient and he was not enduring any obvious complications from the retained bullet, there was no need to remove it. The patient was therefore transferred to a convalescent hospital for fall rehabilitation.

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