SCINTIGRAPHIC DEMONSTRATION OF A BULLET TRACK IN THE BRAIN

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A scintigraphic demonstration of a bullet track in the brain is reported.

Brain contusion may be demonstrated scintigraphically. We report here a case in which the track of a penetrating bullet was demonstrated in the brain by scintigraphy.

CASE REPORT

A 48-year-old man shot himself with a pistol in the right temporal region. He did not lose consciousness and experienced only a slight headache in the left parietal region. Skull radiographs revealed the presence of a bullet in the left hemisphere and a track of small lead scraps, traversing slightly upward from the right temporal region to the midline of the skull (Fig. 1). The patient was referred to the neurosurgical clinic for removal of the bullet. Neurological examination revealed slightly increased tendon reflexes on the right side but no pathological reflexes. The left pupil was slightly larger than the right; the reactions to light were normal. It was decided not to remove the bullet. Scintiencephalography was performed 16 days after the attempted suicide. It showed a more or less round spot of abnormal radioactivity in the right basal fronto-temporal region corresponding to the site of entry of the bullet. A clearly delineated track of abnormal radioactivity was seen traversing the brain from the floor of the anterior

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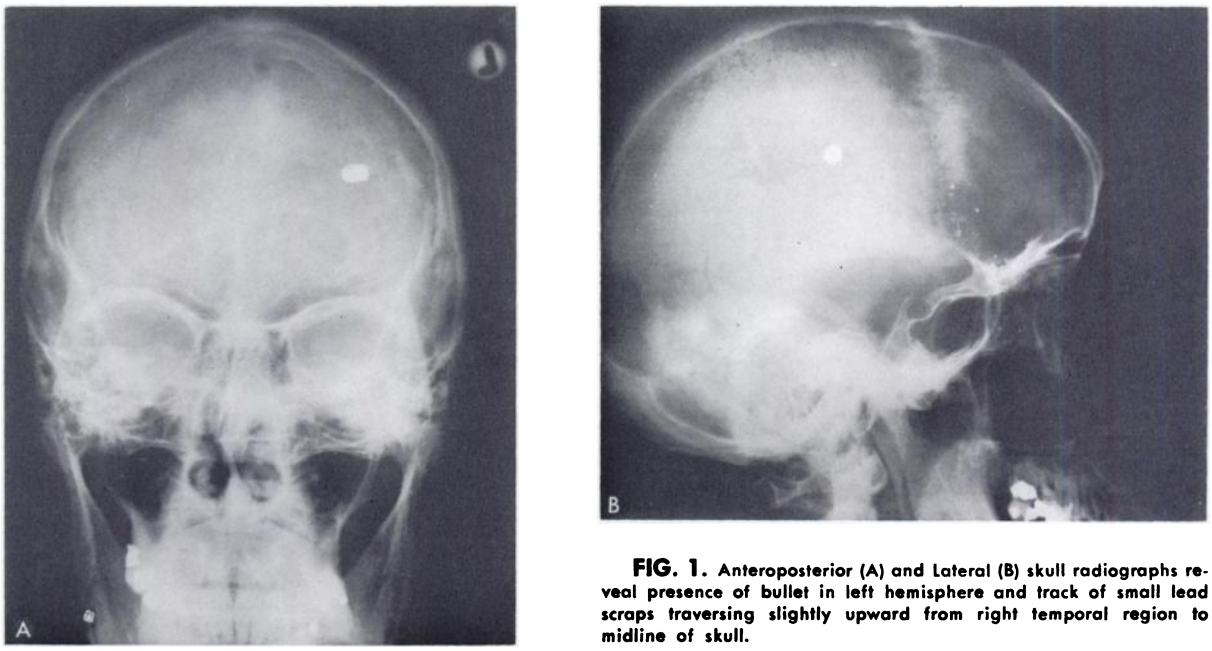

FIG. 1. Anteroposterior (A) and Lateral (B) skull radiographs reveal presence of bullet in left hemisphere and track of small lead scraps traversing slightly upward from right temporal region to midline of skull.

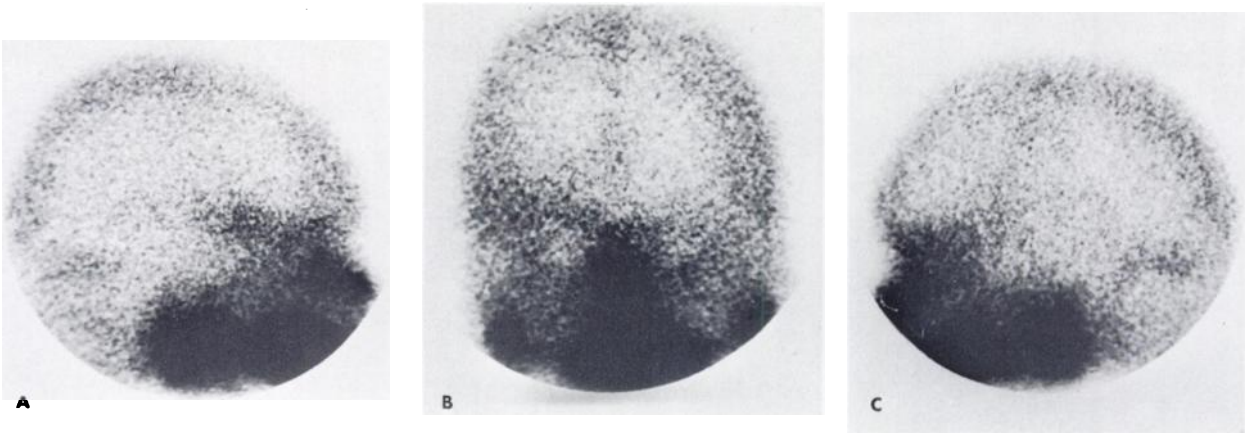

FIG. 2. A is right-lateral scintiencephalographic veiw. In basal fronto-temporal region small rounded area of abnormal radioactivity is noted, corresponding to site of entry of bullet. B is anterior view showing abnormal radioactivity in baso-lateral temporal region on right side due to brain contusion at site of bullet entry. C is left-lateral view. Clearly delineated track of abnormal radioactivity is seen traversing brain from floor of anterior fossa to upper coronal region. From here smaller track is seen to run somewhat more posteriorly ending at site of bullet which is not seen in this view.

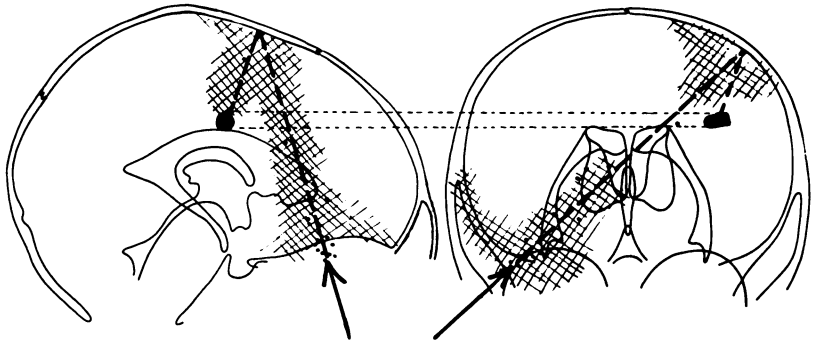

FIG. 3. Schematic drawing of skull in two directions showing site of bullet, localization of lead scraps, and zones of abnormal radioactivity with reconstruction of trajectory of bullet. Ventricular system has been inserted to identify position of cerebral structures. Bullet apparently passed between frontal horns, was stopped by parietal bone, and was reflected back some centimeters into cerebral tissue.

fossa to the upper coronary region. From here a smaller track was seen to run somewhat more posteriorly ending at the site of the bullet.

DISCUSSION

Penetrating missiles of foreign bodies cause direct damage to the brain tissue along their tracks. Missiles of high velocity have a severe disruptive effect while low-velocity bullets may damage only a small zone of brain tissues along their track. Additional lesions of blood vessels may cause severe hemorrhage. To the effect of the missile or foreign body itself may be added the impact of bone at the site of entry which can contribute to the brain damage.

As in brain contusion, damage to the brain tissue itself in penetrating injuries can only be demonstrated by scintiencephalography. Abnormal accumulations of radioactivity indicate the regions where the blood brain barrier function is disturbed. At the site of entry a larger zone of abnormal radioactivity may be due to the simultaneous impact of a foreign body and depressed bone. Of peculiar interest is the demonstration of the track of a bullet as shown in Fig. 1. No other method can show this track unless small fragments of lead are detached along the path of a bullet where bone has been impacted. Visualization of the track of a bullet by scintigraphy is useful because it reveals the regions of the brain which have been damaged and the extent of this damage. Moreover, the visualization may have medicolegal aspects in patients who survive penetrating injury of the brain.

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