Brain injury from a spent bullet descending vertically

Report of five cases

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This is a report of five cases in which a bullet penetrated the vertex of the skull and brain, apparently during its vertical descent after having been fired into the air.

Key Words · brain injury · spent bullet

A bullet penetrating the skull after a direct hit causes severe and even fatal brain injury. However, we have come across an unusual mechanism of brain injury. It is sometimes the custom of the people in the Middle East to shoot their guns straight up in the air as a way of expressing joy in happy circumstances, such as weddings and national occasions. The bullet climbs in the air until it comes to a standstill, then falls in free descent with sufficient force to penetrate the skull. We have seen five cases of brain damage caused in this way, all in children.

Case Reports

Case 1

While having supper in a refugee camp hut, this 3-year-old child suddenly lost consciousness, and his parents noticed blood on the top of his head. There was a bullet hole in the corrugated tin roof of the hut over his head. When admitted to the hospital, the child was unconscious and remained so for 3 hours. On recovery he was found to have mild right hemiparesis and nystagmus with lateral gaze. X-ray films of the skull showed that the bullet had entered the top of the left parietal region and settled in the left cerebellar hemisphere (Fig. 1). The posterior fossa was explored and a bullet weighing 7.5 gm extracted from the cerebellum. The patient's postoperative condition and progress was satisfactory.

Fig. 1. Bullet in posterior fossa; point of entry (arrow) is in the vertex of the skull.

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Case 2

While standing at the door of his house, this 11-year-old child suddenly fell unconscious. Blood was noticed on the top of his head. He was stuporous when admitted to the hospital but moved all limbs in response to painful stimuli. Fundi showed bilateral papilledema. X-ray films of the skull showed a bullet deep in the right frontal region with a wound of entry in the top of the right parietal region (Fig. 2). Through frontal craniotomy a bullet weighing 8 gm was extracted from the frontal lobe where it was found lying loose in a cavity full of clotted blood and necrosed brain. The cavity communicated with the ventricle. Postoperatively the patient remained unconscious and died 48 hours later.

Case 3

During the 1967 Middle East war this girl, then 3 years old, was standing in the doorway of her house when she cried out but did not lose consciousness. Blood was noticed on the top of her head. First-aid treatment was given to the scalp wound in the right frontal region. No more was done although it was noticed that she had left-sided weakness. In 1969, she was taken to a doctor with a complaint of persisting weakness and headache. Skull x-ray films taken then showed a bullet in the left occipital region with a point of entry at the top of the skull in the right frontal region (Fig. 3). The left posterior fossa was explored and a bullet weighing 2.5 gm was found intradurally just beneath the skull, surrounded by adhesion. Postoperatively the child did well.

Case 4

While having supper in a refugee camp hut this 2-year-old child lost consciousness. The parents not knowing what was wrong took him to the hospital. Blood was noticed on the scalp, and the child was unconscious and cyanosed. He had apparently aspirated vomitus. X-ray skull films showed a bullet in the left occipital region with a point of entry in the top of the left parietal bone near the midline. Resuscitation was attempted, but the child died 4 hours later. Later investigation revealed a bullet hole in the corrugated tin roof of the hut over the spot where the child had been standing.

Case 5

Twelve days before admission, while standing in front of her house this 1-year-old child suddenly lost consciousness for a few minutes. She was taken to a doctor who sutured a scalp wound in the top of the left parietal region posteriorly near the midline. The parents were not satisfied and a few days later took her to another doctor, because the child was not looking well and was vomiting. On admission to the hospital the child was neurologically normal. X-ray films of the skull showed a bullet lodged among the neck muscles, with a point of entry into

Fig. 2. Bullet lying vertically in the frontal region; arrow shows point of entry.

Fig. 3. Bullet in the occipital region.

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the skull 2 cm above and to the left of the lambda, and a point of exit through the right side of the occipital bone. The bullet, which weighed 7.5 gm, was easily extracted and the entry wound repaired.

Discussion

The site of entry in each case was at the top of the skull, which strongly suggests that the bullet descended vertically. That the five patients reported were all young children could be mere coincidence, or because a child's skull is softer and thinner than that of an adult, although one would expect adults to be more exposed to this type of injury. We believe that in these cases the bullet was shot up in the air, reached a point of standstill, and then descended with enough velocity to penetrate a child's skull.

There were two deaths in the series; in one of these there was a ventricular penetration and hemorrhage, which carries a poor prognosis.

In this case also the bullet was of a large size (8 gm). In the other fatal case, the patient died as a result of vomitus inhalation. The three remaining patients tolerated the injury quite well.

Summary

We have reported five cases in which children sustained injury of the brain from a bullet which apparently descended vertically and penetrated the skull. The brain damage in these cases was less than that sustained through a direct hit.

References


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