



H50 Around the World: A Short Case Series of Atypical Intracranial Bullet Tracks

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Learning Overview: While most bullet pathways within the brain follow a linear pathway, bullets may travel along the inner table of the skull and come to rest on the opposite side of the head, without directly causing deep brain injuries. The goal of this presentation is to show that penetrating intracranial gunshot wounds may travel along the inner table of the cranial vault and come to rest on the opposite side of the head without an exit wound and without penetrating the deep structures of the brain.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by recognizing a unique intracranial phenomenon. Bullet pathways in gunshot wounds of the head frequently are linear within the cranial vault, with a linear wound path between entrance site and the final resting place of the projectile. Although ricochets may occur, especially with smaller caliber projectiles or projectile fragments, these too tend to produce linear pathways between entrance and ricochet point, as well as ricochet point and the final resting place of the projectile. This presentation describes two cases in which projectiles entered the cranial vault and traveled along the inner table of the skull, coming to rest in the superficial brain on the side opposite the initial entrance site, with no deep brain injuries identified. This phenomenon may explain clinical situations wherein physical findings (entrance site) and radiographic projectile location suggest a pathway through the central brain, but where clinical findings do not support such a linear pathway.

Proposition: Penetrating intracranial gunshot wounds may travel along the inner table of the cranial vault and come to rest on the opposite side of the head without an exit wound and without penetrating the deep structures of the brain.

Case Descriptions: Case 1—A 19-year-old male sustained multiple lethal gunshot wounds, including of the head, following an altercation on a street corner. Paramedics noted a bleeding entrance wound in the left temporal region. Imaging revealed a bullet within the right posterior cranium. At autopsy, the medium-caliber (.38 special) projectile was noted to have entered the left temporal region and traveled along the inner table of the skull, stopping within the superficial right occipital lobe. There was no bullet track through the deeper aspects of the brain. Case 2—A 42-year-old male was found dead in an auto shop from a suicidal gunshot wound to his left submental chin. Imaging revealed a bullet within the right cranium. Autopsy revealed the large-caliber bullet traveled superiorly and entered the cranial vault via the left anterior cranial fossa. The bullet damaged the left frontal lobe, then traveled along the inner contour of the skull, crossing the midline before stopping within the right superficial parietal lobe. There was an absence of injury of the deep central structures of the brain.

Conclusions: The cases presented here may help explain potential circumstances in which a projectile is located radiographically on the opposite side of the head from the corresponding entrance wound, without evidence of deep brain injuries. The projectile may not have traversed the deep vital brain structures, and particularly in the absence of an exit wound, should not be assumed to have traveled linearly. Depending on the circumstances of the case, such an occurrence may help to explain the potential physical activity of a gunshot wound victim and/or the clinical/radiologic findings. The cases presented illustrate the possibility that bullets, even those larger than small-caliber bullets, may travel along the inner table of the skull before coming to rest on the opposite side of the head, without direct damage to deep brain structures.

Forensic, Intracranial, Firearm