

## **Glass Penetrating Skull Injury Mimicking Projectile Injury**

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The author reports no conflict of interest.

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### **CASE SUMMARY**

A 29-year-old man was involved in a motor vehicle accident as a driver in May 2021. According to the available history, his car overturned and hit a wall. Death was due to head injury. Diffuse brain injury was present. A small piece of glass penetrated the left occipital bone of the skull. What was remarkable was that this wound mimicked a projectile injury. Were it not for the small fragment of glass lodged within the central aspect of the bony wound defect, this wound could have been construed as that of a projectile injury.

A small shard of glass penetrated the left occipital aspect of the skull of the victim. This bony wound defect was located approximately 6 cm posterior-and-lateral from the greater wing of the left sphenoid bone. This bony wound defect showed inward beveling of bone. The tabula externa defect measured approximately 1 cm in diameter. The tabula interna defect measured approximately 1.5 cm in diameter. Were it not for the small fragment of glass lodged within the central aspect of this bony wound defect, it could easily have been construed as that of a projectile injury. The purpose of this article is to sensitize readers as to other projectile mimics (Figs. 1–4).

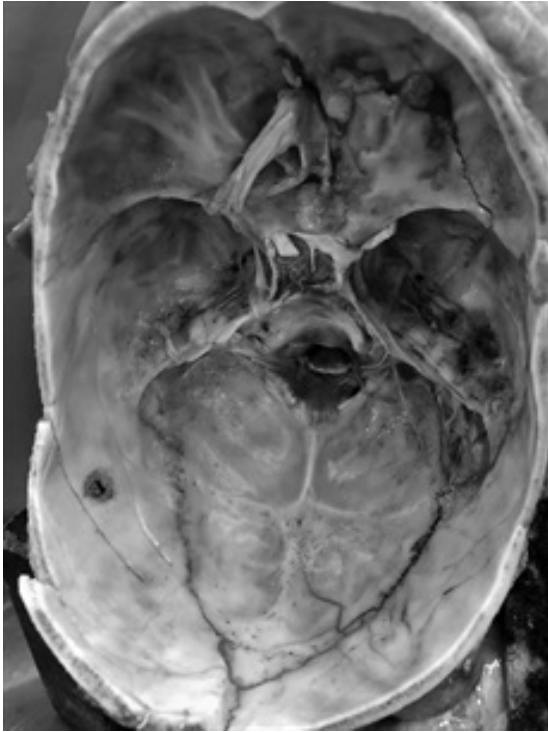


FIGURE 1: A small shard of glass penetrated the left occipital aspect of the skull. This bony wound defect was located approximately 6 cm posterior-and-lateral from the greater wing of the left sphenoid bone. This bony wound defect shows inward beveling of bone.

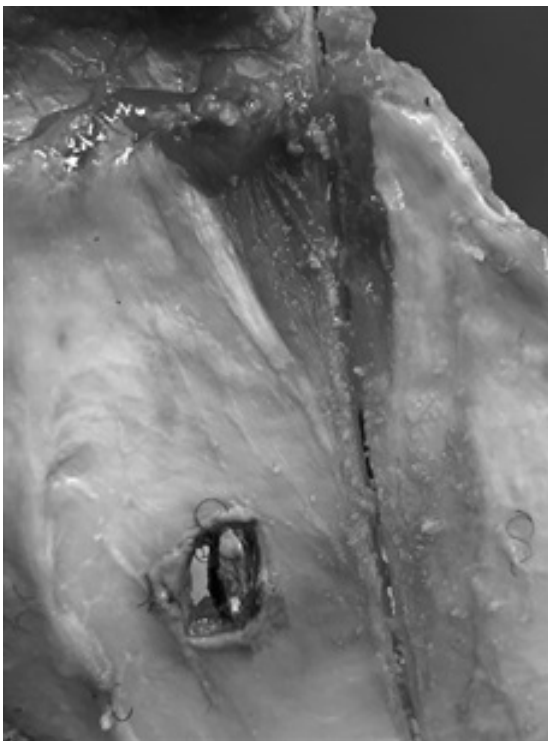


FIGURE 2: The tabula externa defect measured approximately 1 cm in diameter. This bony wound defect shows inward beveling of bone. A small fragment of glass is noted within the central aspect of the bony wound defect.

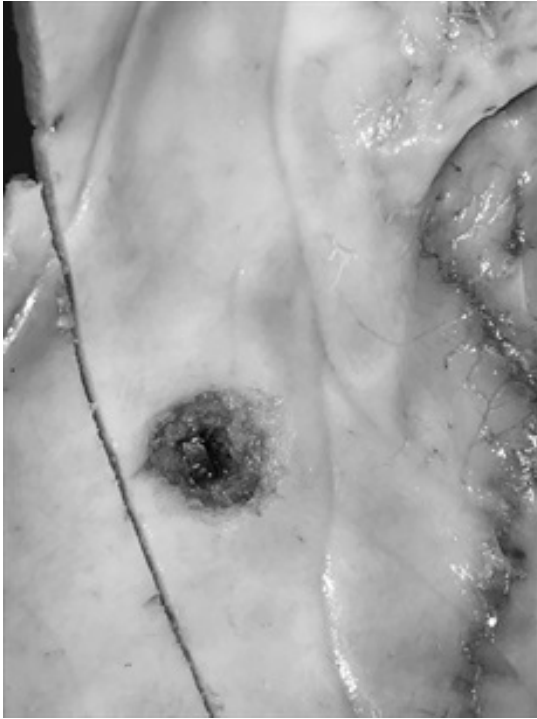


FIGURE 3: The tabula interna defect measured approximately 1,5 cm in diameter. This bony wound defect shows inward beveling of bone. A small fragment of glass is noted within the central aspect of the bony wound defect.

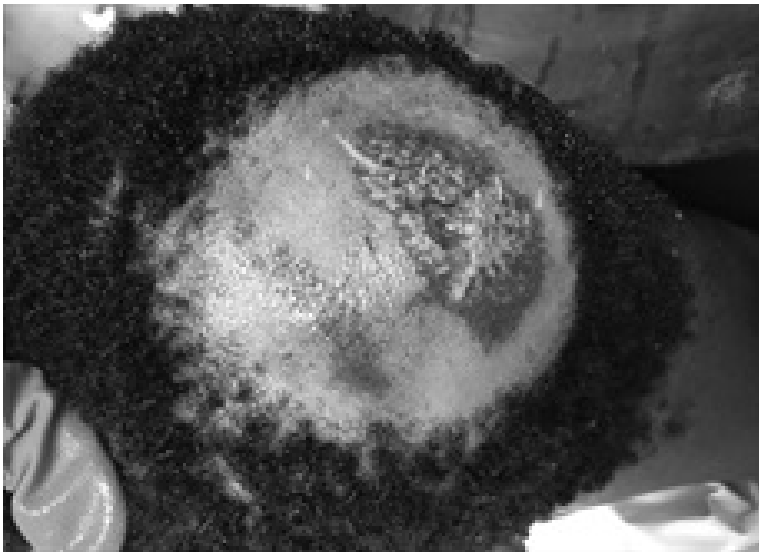


FIGURE 4: A photograph showing the original external wound.

## DISCUSSION

Foreign objects are often embedded into the skull during penetrating head trauma. Most of the intracranial foreign bodies occur around the orbit, frontal sinus, and the nasal areas because of the thinness of bone at such places. Numerous types of foreign bodies, such as wood, pellets, stones, umbrella tips, pencils, nails, keys, and knitting needles, have been reported in the literature.<sup>1</sup>

A case of penetrating head injury caused by glass was reported by Gray et al.<sup>2</sup> Rarely does glass cause such an injury. The potential for misdiagnosis of this type of injury has been discussed in the literature.

The breaking of flat glass, the size and distribution of fragments from a vehicle, has been described by Allen et al.<sup>3</sup> Please note that the forensic aspects of the different type of shattered glass, and their size and distribution, is beyond the scope of this article.<sup>3-7</sup>

A rare case of compound head injury in which a piece of glass had penetrated through the skull into the brain was also discussed by Sharma et al.<sup>8</sup> Sharma's case involved a 19-year-old male patient who accidentally fell from his bicycle. This led to an impact with the glass wall of a showroom. Skull radiographs were obtained and showed a radiopaque foreign body in the right temporal region. A computed tomography scan of the brain revealed a hyperdense foreign body that had penetrated intracranially through the squamous part of the right temporal bone. It had traversed the right temporal region of the brain, extending into the right occipital lobe. The glass carried a depressed bone fragment with it into the right parietal lobe of the brain.<sup>8</sup>

Srivastava et al<sup>9</sup> also reported a case of penetrating head injury caused by glass. A 9-year-old boy slipped on a bathroom floor. His right parietal scalp and right hand were cut by broken glass. CT head was done which disclosed a single, 3-cm long, radio-opaque foreign body penetrating through the skull bone into the right parietal lobe. Srivastava's case illustrated the necessity of exploring scalp wounds.

As mentioned, most of the intracranial foreign bodies occur around the orbit, frontal sinus, nasal and temporal area. Rarely does glass cause such an injury. Intracranial penetration of glass to the parietal region is rare because of the hardness and thickness of the overlying parietal bone.<sup>9</sup> This case describes penetration of the occipital bone by glass.

The minimum velocity required by a projectile to effect penetration of bone should be used with caution.<sup>10</sup>

The potential for misdiagnosis of this type of injury has been reported in the literature. The purpose of this article is to sensitize readers as to other projectile mimics.

## **ACKNOWLEDGMENTS**

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