

## CLINICAL IMAGE

**Cranial Impalement: A Late Discovery of a Non-Metal Foreign Object**Francisco J. Lugo Rincón-Gallardo, MD,<sup>1</sup> Ana P. Mendoza-Gaona, MD<sup>1</sup>

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A 64-year-old farmer was brought to the emergency department after he was found lying on the ground. He had been herding sheep in the fields prior to being found. He was disoriented, and left facial edema was seen, as well as a small laceration on the left side of his upper lip and hematic traces in the oral cavity. Head computed tomography (CT) revealed a 122-Hounsfield-unit (HU) linear foreign body that penetrated the base of the skull (Figure 1). Seven days later, a new CT scan revealed an increase in density (137 HU) of the penetrating body (Figure 2). Infectious complications developed, and despite antibiotic therapy, progressed to septic shock and death. The material of the penetrating foreign body was never identified.

Detection of head-penetrating foreign bodies remains a challenge, mainly because they may not be visible on clinical examination, and some materials, like wood, are barely visible on CT scans. Wooden foreign bodies demonstrate increasing HU over time (within

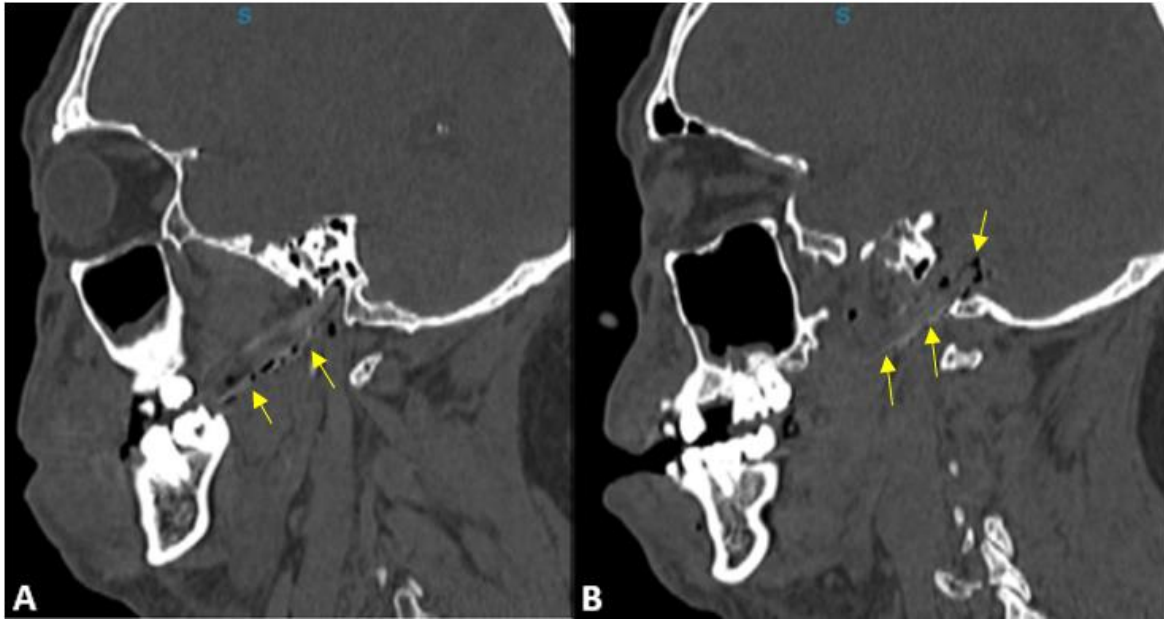
approximately one week), probably caused by the gradual absorption of blood and liquid into porous dry wood. We hypothesize that the farmer had a wooden walking stick with a sharpened tip. Somehow, he tripped and as he fell, he got stabbed with the cane in the face, penetrating the base of the skull. The impact caused the tip of the cane to break off. As soft tissue swelled, the remains of the cane became embedded in the soft tissue, leaving no trace of the foreign body on clinical examination.

**Notes**

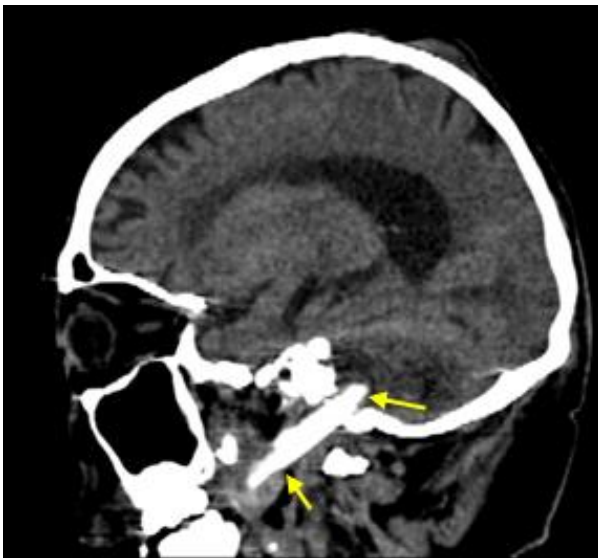
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**Figure 1.** A. Sagittal computed tomographic scan of the head showing a 122 HU linear foreign object (yellow arrows) seen from the left lower molars in a direction towards the base of the skull. B. Crossing of the base of the skull by the foreign object (yellow arrows).



**Figure 2.** Sagittal head CT seven days later showed an increase in the Hounsfield units (137) of the foreign object.

**REFERENCES**

1. Peterson, J. J., Bancroft, L. W., & Kransdorf, M. J. Wooden foreign bodies: imaging appearance: Imaging appearance. *AJR. American Journal of Roentgenology*. 2002; 178(3), 557–562. doi:10.2214/ajr.178.3.1780557
2. Krimmel, M., Cornelius, C. P., Stojadinovic, S., Hoffmann, J., & Reinert, S. Wooden foreign bodies in facial injury: a radiological pitfall. *International Journal of Oral and Maxillofacial Surgery*. 2001; 30(5), 445–447. doi:10.1054/ijom.2001.0109
3. Kudo, S., & Takei, T. *Computed tomography settings for optimal detection of wooden foreign bodies*. *The American Journal of Emergency Medicine*. 2016; 34(11), 2237–2238. doi:10.1016/j.ajem.2016.08.025
4. Voss, J. O., Maier, C., Wüster, J., Beck-Broichsitter, B., Ebker, T., Vater, J., Dommerich, S., Raguse, J. D., Böning, G., & Thieme, N. Imaging foreign bodies in head and neck trauma: a pictorial review. *Insights into Imaging*. 2021; 12(1), 20. doi:10.1186/s13244-021-00969-9
5. DenOtter TD, Schubert J. Hounsfield Unit. In: StatPearls. Treasure Island (FL): StatPearls Publishing; March 9, 2022.