

## Orbito-antro-cervical foreign body impaction: reminder of a CT scan and ultrasonography pitfall.

AA Olusanya and VI Akinmoladun

Department of Oral and Maxillofacial Surgery, College of Medicine,  
University of Ibadan, Ibadan, Nigeria

### Abstract

**Introduction:** Foreign body impaction within the maxillofacial region is not an uncommon occurrence. Imaging of such objects is of paramount importance to their retrieval in order to assess their relation to vital structures as well as avoid disruption of such structures while retrieving the foreign bodies. We report a case of wooden foreign body which traversed the maxillofacial region, imaging of which posed a significant challenge.

**Methods:** A sixteen year old female presented with a wooden foreign body impaction following a road traffic accident. Challenges in the course of investigation and events during the surgical retrieval of the foreign body are described.

**Result:** An unusual case of foreign body impaction transecting the right orbit, right antrum and the pharynx is presented. The inability of both Computed Tomographic scan and Ultra Sound scan to identify the path and relations of the impacted foreign body was also discussed.

**Conclusion:** Computed Tomography and Ultrasonography may not be sufficient to delineate the path and relations of an impacted foreign body especially if the nature of the foreign body is not metallic.

**Keywords:** Foreign body, computed tomography, ultrasonography.

### Résumé

**Introduction:** L'introduction de corps étranger dans la région maxillo-faciale n'est pas un événement rare. L'imagerie de ces objets est d'une importance primordiale pour leur récupération en vue d'évaluer leur relation avec les structures vitales ainsi que pour éviter la perturbation de ces structures lors de la récupération des corps étrangers. Nous rapportons un cas de corps étrangers en bois qui a traversé la région maxillo-faciale et dont l'imagerie un grand défi. **Méthodes:** Une demoiselle âgée de seize ans a été présentée avec l'introduction de corps étranger en

bois suite à un accident de la circulation routière. Les défis dans le cadre de l'enquête et des événements au cours de l'extraction chirurgicale du corps étranger sont décrits.

**Résultat:** Un cas inhabituel d'introduction de corps étranger sectionnant l'orbite droite, l'antre droit et le pharynx est présenté. L'incapacité des deux tomodensitométries et l'Ultra analyse sonore pour indiquer le parcours et les relations du corps étranger introduit ont également été abordés.

**Conclusion:** La tomodensitométrie et l'échographie peuvent ne pas être suffisantes pour délimiter le parcours et les relations d'un corps étranger touché surtout si la nature du corps étranger n'est pas métallique.

### Introduction

The maxillofacial region is a closely knitted region in the vicinity of several vital organs such as the globe, brain and the great vessels of the neck. Foreign body impaction into this region may therefore put any of these structures at great risk of injury which may be life threatening. It was remarkable to find a foreign body traversing an appreciable length within the head and neck region without resulting in significant morbidity. Impaction of a wooden foreign body poses a diagnostic challenge in that the three main modalities of imaging techniques may not categorically localize or outline such an impacted foreign body [1-3]. Here we report a case of an orbito-antro-cervical wooden foreign body impaction, imaging of which was not reliable.

### Case report

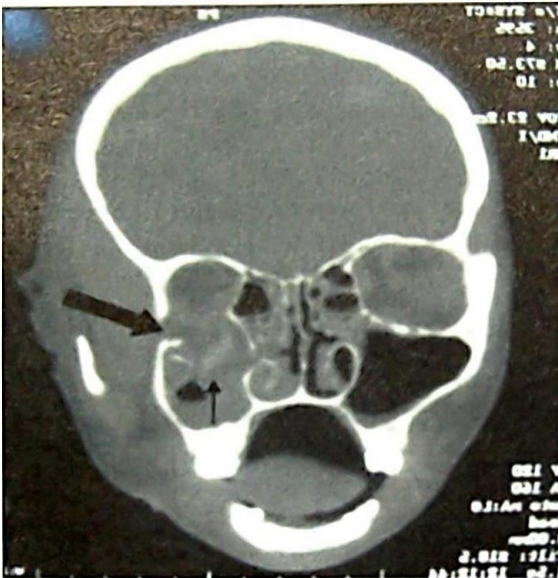
A sixteen year old female was brought into the accident and emergency department of our hospital following a road traffic accident. She was said to have been a back seat passenger in a salon car which collided with the rear of a lorry conveying bamboo sticks. Following the impact there was no history of loss of consciousness but there was bleeding from the nose and mouth. The ragged ends of 2 wooden objects were found protruding from the right orbit and the right temporal region (Figure 1).



Vision in the right eye could not be verified because patient was unable to open the eye as the upper eyelid was impaled by the foreign body as it entered the orbit.



**Fig. 1:** The ragged ends of 2 wooden objects were found protruding from the right orbit (black block arrow) and the right temporal region (black line arrow).



**Fig. 2:** CT scan showing fracture of the lateral wall (black block arrow) and floor of the right orbit (black line arrow). It is worthy of note that neither the presence nor path of the wooden foreign body is seen on the CT scan.

Intra-orally, there was no evidence of the foreign body traversing the oral cavity. The lateral cervical region on the contralateral side had a well circumscribed firm bulge of about 3 cm in widest diameter. This swelling was not mobile, not attached to overlying skin which appeared clinically normal. Plain radiographs did not show any evidence of the foreign body except for a homogenous radio-opacity of the right antrum. A computerized tomographic scan showed fracture of the lateral wall and floor of the right orbit and a faint outline of the orbital component of the foreign body bridging the floor of the same orbit without any demonstrable evidence of the foreign body impaction (Figure 2).

Imaging of the contralateral neck swelling on CT was not informative. Ultrasonography of the lateral cervical swelling using a 7.5 MHz probe was suggestive of a "calcified lymph node." There was no family relation or an individual previously known to the patient to ascertain if the swelling was there before the injury. A decision was made to retrieve the assumed orbito-antral foreign body under general anaesthesia.

Intraoperatively, the foreign body in the temporal region was relatively mobile unlike the one projecting from the right orbit which was very firm. The temporal one was separated from the surrounding soft tissue by blunt dissection. It was retrieved readily without complication and the residual defect was irrigated copiously with sterile saline solution. The defect was not closed primarily but packed with a ribbon gauze dressing impregnated with an antiseptic solution; argotone. The right orbit was then carefully explored to reveal an intact globe with the wooden foreign body bridging the floor of the orbit.

Access was gained into the right antrum via the right canine fossa. In the antrum an instrument was introduced between the floor and on the side of the foreign body. With the aid of this ledge the foreign body was gently pushed upwards while an aiding tug was made on the part protruding from the orbit. Simultaneously, the orbital contents were safely retracted away from the path of withdrawal. It was discovered that the contralateral cervical swelling began regressing while the foreign body was being withdrawn. The process was uneventful; there was no secondary injury to adjacent structures along the path of the foreign body withdrawal. The right antrum was subsequently evacuated of blood clots and residual wooden debris. The floor of the orbit was comminuted, the remnants of the fractured floor was put together with minimal residual defect. The right orbit and antrum were also irrigated copiously with



sterile normal saline. The canine fossa was closed and the lacerated upper eyelid was sutured.

The foreign bodies retrieved were bamboo splinters and a ring of same bamboo wood. The splinter retrieved (from the orbit) measured about 18 cm and the one from the temporal region about 15 cm in length (Figure 3).



Fig. 3: The splinter retrieved from the orbit (black block arrow) measured about 18cm and the one from the temporal region (black line arrow) about 15cm in length.

Postoperative period was uneventful. Patient made a full recovery and vision was intact in the right eye. A five-day course of prophylactic antibiotics of intravenous ceftriaxone and metronidazole was completed and the gauze dressing in the right temporal region was changed daily as the wound granulated progressively from its depth. This was later closed secondarily on sixth postoperative day following which patient was discharged home to be seen at subsequent follow up visits in the clinic.

### Discussion

The path of the foreign body in this report was unexpected. It was assumed, preoperatively that the foreign object on entering the right antrum from the floor of the right orbit, the splinter had penetrated the palate (floor of the antrum) on leaving it. This was not the case intraoperatively. In order to explain how the foreign body must have traversed craniocervical region from the right temporal region to the left cervical region without disrupting a vital structure, it must have passed behind the posterior wall of the antrum, sparing the floor, across the

narrow nasopharyngeal space and into the contralateral cervical region without fatally injuring any vital structure. This was an interesting occurrence.

The possibility of the orbital or temporal wooden object extending across the right antrum to the left cervical region was entertained but there was no evidence of trauma either within the oral cavity or the cervical spine which the foreign body was expected to have transected in its path. Also, had there been a relation or an individual known to the patient before the accident, to confirm the left cervical swelling was not there before the accident; the possibility of the foreign body transecting the entire craniocervical region posteriorly would have carried more weight.

Limitations of plain radiographs, CT and MRI when imaging wooden objects are not unknown in literature [1-3]. Wooden objects may appear hypodense on CT in an acute setting but their internal striated structure may become apparent as water is absorbed from the surrounding structures with time [3,4]. Wooden foreign bodies on CT have been documented to simulate air because of their low attenuation [2,5-7]. Kantarci *et al* [5] described the use of a multidetector computed tomography and multiplanar reconstruction for the imaging of a wooden foreign object traversing the neck via the glabella. This object, they reported, was not detected by the conventional radiograms and standard CT thus corroborating what happened in the present report case. Fujimoto *et al* [8] in their report of three cases with intracranial wooden foreign bodies stated that it is difficult to confirm intracranial foreign body accurately by means of only plain skull film and usual CT scans and that it is useful to know the CT values for various objects.

Peterson *et al* [1] retrospectively reviewed 12 patients with surgically confirmed wooden foreign bodies and found that with MR imaging, wooden foreign bodies displayed a variable signal intensity that was equal to or less than that of skeletal muscle on both T1- and T2-weighted images. CT showed the retained wood as linear cylindrical foci of increased attenuation. Wood was highly echogenic and revealed pronounced acoustic shadowing on sonography [1]. They concluded that the imaging appearance of wooden foreign bodies is variable and that imaging can be quite specific when taken in the appropriate clinical setting. They further stated that sonography is frequently under-utilized but it proved most useful for the evaluation of retained wooden foreign bodies in their study [1]. However, this was not the case in our report; had the findings of the ultrasonography



confirmed that the left cervical swelling was due to a wooden foreign object instead of 'a calcified lymph node', the path of the foreign body would have been better understood and the surgical plan for retrieval would have included an open surgical intervention instead of the closed method of retrieval with its potentially fatal possible complications like injuries to major cervical blood vessels.

In conclusion it appears the use of CT scan as an imaging modality for an impacted wooden object is unreliable, especially in the acute phase. In a centre where sophisticated modalities of imaging such as a multidetector CT are not available, such as ours, the surgeon is faced with a dilemma of investigating the vicinity of an impacted wooden foreign, the knowledge of which will aid in the planning of the surgical retrieval of such an object.

## References

1. Peterson JJ, Bancroft LW, and Kransdorf MJ. Wooden foreign bodies: imaging appearance. *AJR Am J Roentgenol.* 2002 Mar;178(3):557-562.
2. Ginsberg LE, Williams DW 3rd and Mathews VP. CT in penetrating craniocervical injury by wooden foreign bodies: reminder of a pitfall. *AJNR Am J Neuroradiol.* 1993 Jul-Aug;14(4):892-895.
3. Krimmel M, Cornelius CP, Stojadinovic S, *et al.* Wooden foreign bodies in facial injury: a radiological pitfall. *Int J Oral Maxillofac Surg.* 2001 Oct;30(5):445-447.
4. Imokawa H, Tazawa T, Sugiura N, *et al.* Penetrating neck injuries involving wooden foreign bodies: the role of MRI and the misinterpretation of CT images. *AurisNasus Larynx.* 2003 Feb;30 Suppl:S145-147.
5. Kantarci M, Ogul H and Karasen RM. Detection of a giant wooden foreign body with multidetector computed tomography and multiplanar reconstruction imaging. *Am J Emerg Med.* 2007 Feb;25(2):211-213.
6. Myllylä V, Pyhtinen J, Päivänsalo M, *et al.* CT detection and location of intraorbital foreign bodies. Experiments with wood and glass. *Rofö.* 1987 Jun;146(6):639-643.
7. Yano H, Nishimura G, Sakamoto K, *et al.* An intracranial wooden foreign body without neurological findings: case report. *J Trauma.* 1995 May;38(5):830-832.
8. Fujimoto S, Onuma T, Amagasa M and Okudaira Y. Three cases of an intracranial wooden foreign body. *No ShinkeiGeka.* 1987 Jul;15(7):751-756.
9. Porter MD and Schriver JP. Ultrasound-guided Kopans' needle location and removal of a retained foreign body. *SurgEndosc.* 2000 May;14(5):500. Epub 2000 Mar 24.

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