Chopstick Injury Penetrating the Skull Base: A Case Report

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ABSTRACT

We describe an unusual case of a foreign body penetrating the skull base and lodging in the posterior fossa. A 38-year-old woman fell onto a chopstick while eating, causing it to impact into her mouth. The chopstick penetrated the oropharynx and the occipital bone via the jugular foramen to enter the posterior fossa intracranially, piercing the tentorium cerebelli and leaving a fractured tip in the occipital lobe. Three-dimensional reconstructive computed tomographic scans were obtained to view the trajectory and position of the chopstick. Reconstructed angiography revealed the proximity of the carotid artery and the jugular vessels to the foreign object. Safe access to the chopstick was via an occipital craniotomy to retrieve the distal portion and an ipsilateral retrosigmoid craniectomy to remove the proximal end. Provision was made to gain proximal control of all major nearby vessels in the event of any hemorrhage. Trauma causing penetration of a foreign body into the posterior fossa of the skull is rare due to its surrounding thick bone. Appropriate preoperative planning, including 3-D computed tomographic images and angiograms, are integral in the surgical approach for the safe removal of such objects.

KEYWORDS: Chopstick, penetrating trauma, posterior fossa, skull base

There are numerous case reports of penetrating injuries to the cranium with a wooden or metal chopstick.^{1–5} The injury is usually through the orbit, nose, ear, or thin-walled skull regions.^{5–9} Penetration of a foreign body into the posterior fossa is rare due to the surrounding thick bone.⁹ This report details an unusual case of a chopstick passing through the posterior wall of the oropharynx, through the jugular foramen, and into the posterior fossa. Detailed computed tomographic (CT) reconstructions were integral to the planning of surgical removal.

CASE REPORT

History and Examination

A 38-year-old woman was dancing at a wedding while eating food with chopsticks. She was inadvertently

pushed from behind, causing her to stumble and land on one of the chopsticks which became impacted in her mouth. In the emergency room, she was found to be cardiovascularly stable, maintaining her airway adequately with no hemorrhage or major secretions coming from the mouth. Neurologically, pupils were isocoric, 4 mm, and reactive. She was unable to speak but was alert and responding appropriately via a Mandarin-speaking translator. There were no other injuries. She was taken to the CT scanner with immobilization of the c-spine. The plastic chopstick had penetrated the posterior wall of the oropharynx, displaced the carotid artery laterally, and entered the posterior fossa via the left jugular foramen. The distal end had perforated the tentorium and had broken off in the occipital lobe (see Figs. 1A, B, and 2).

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Figure 1 (A, B) Computed tomographic reconstructions of the penetrating foreign body.

Operation

Antibiotics were started to cover oral microbial contaminants. Following awake fiber-optic nasal intubation in the emergency department (Fig. 3), she was taken to the operating theater immediately. A left occipital craniotomy was made to remove the distal fragment of the chopstick. A retrosigmoid craniectomy was performed to visualize the proximal fragment (Fig. 4), which was lying in the cerebellopontine angle, traversing the jugular foramen. The left transverse sinus was ligated using Ligaclips (Ethicon, Inc., Somerville, NJ) to achieve proximal control of the sinus. Provision was made to expose the jugular

vein in the neck but the vessel was not exposed prior to removal of the chopstick. Despite repeated attempts, the chopstick was stuck too firmly for direct removal. It was thus necessary to drill off the portion of the chopstick in the posterior fossa, and hammer the proximal portion back through the jugular foramen and out of the pharynx. Bleeding from the jugular foramen was controlled readily with Surgicel (Ethicon Inc.) and Floseal (Baxter Healthcare Corp., Fremont, CA). The defect in the posterior pharyngeal wall was sutured.

Postoperative Course

The patient was kept sedated and ventilated immediately after the operation because of cerebellar swelling with 25-degree head elevation, keeping her mean arterial pressure below 70 mm Hg. Day 2 postoperatively she was weaned off sedation and extubated. She was able to obey commands and move all four limbs normally. She had nystagmus and a left 9th, 10th, and 12th nerve palsy with reduced ipsilateral hearing but normal facial power. Speech and language therapists found severe pharyngeal dysphagia with decreased gag and cough reflex and decreased hearing in the left ear. She was placed on nasogastric feeding. Videofluoroscopy and nasoendoscopy showed a paralyzed left vocal cord. A mild quadrantanopia was also elicited on formal visual field testing. Uneventful rehabilitation took place with no cognitive impairment. An angiogram of the neck vessels, performed to exclude a vascular cause of the lower cranial nerve problems, ruled out dissection of the vertebral arteries. She was discharged from the hospital with plans for community speech and language therapy, audiology, outpatient voice clinic, and outpatient neurosurgical review.

Figure 2 Coronal computed tomographic angiography reconstructions showing the chopstick (C) in relation to the carotid artery (arrow), which has been displaced laterally. No internal jugular venous drainage is seen on the left.

Figure 3 Postintubation in the emergency room.

DISCUSSION

We found only one case of penetrating trauma through the jugular foramen¹⁰ causing foramen jugulare syndrome. In that case, the wooden object projected into the cerebellopontine cistern but did not directly affect brain parenchyma. Two other cases were found involving penetration through the base of the skull; one with a television antenna through the sphenoid sinus and pituitary fossa¹ and the second, a chopstick through the middle ear and petrous temporal bone.⁷

Neuroradiology is essential in preoperative diagnosis and surgical planning. Wood and plastic are

difficult to see on CT unless coated in glaze. Shards of wood absorb water molecules and can therefore exhibit a density as low as fat or air.^{10,11} Magnetic resonance imaging is able to distinguish wooden intracranial foreign bodies better than CT, and gadolinium can enhance the images of the surrounding tissue.¹² In this case, emergency tridimensional CT was integral to the accurate location of the plastic chopstick. In other circumstances, we acknowledge that a patient may not be stable enough to await thorough radiological imaging, and immediate surgery may be necessary.

Figure 4 Left retrosigmoid craniectomy showing the protruding proximal end of the chopstick in the cerebellopontine angle.

Two separate craniotomies were necessary to extract the wedged oblique object safely. Proximal control of the transverse sinus was necessary, and although provision for distal jugular vein control was made, it was not required as direct control of bleeding at the jugular foramen was uncomplicated.

Foreign bodies into the cranium may pose many immediate complications, such as pneumocephalus, intracerebral hemorrhage, contusions, and brain stem injury.^{2,12} In the long term, it can lead to abscesses, meningitis, and encephalitis.^{6,13} Early management with surgery to debride the wound and remove the fragments are necessary for good outcomes.^{3,14} Post-operative antibiotic treatment should be administered to prevent infections.²

NOTES

Consent was obtained from the patient for publication of the case and photographs.

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