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Case report

Penetrating transoral cranial injury by a chopstick through the jugular foramen: Report of a case

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ABSTRACT

A 57-year-old man attempted to commit suicide by thrusting a chopstick into his throat during a meal, resulting in penetrating injury into the cranium. Computed tomography revealed that the chopstick had penetrated the soft palate and passed through the jugular foramen to the cerebellum, damaging the internal jugular vein. The chopstick fractured in the lateral pharyngeal space and was impossible to observe directly from the oral cavity, requiring surgical cooperation with neurosurgeons to remove the object under general anesthesia. After one end of the chopstick body was identified in the deep portion of the styloid prominence, an approach was made from the neck to prevent hemorrhage and gas embolism in the affected internal jugular vein. The other end of the chopstick was identified near the jugular foramen and it was removed through the neck via occipital craniotomy. Post-operative management included sedation and artificial ventilation to manage brain contusion and edema and intracranial inflammation. The patient was gradually recovered and transferred to a general ward 4 weeks after the surgery. After 4 years, the patient retains clear mentation, but remains hospitalized in a rehabilitation hospital because of persistent quadriplegia.

1. Introduction

There are few case reports on injuries involving foreign bodies that penetrate the cranium through the oral cavity, and the optimal treatment of these injuries is controversial [1–6]. Surgical removal of the foreign body is often difficult because of poor surgical visibility. The risk of potentially fatal intra- or post-operative complications such as severe bleeding also exists [1,5]. Even if the damage does not reach the brain, severe infarction and secondary bleeding can also occur [7–13]. Because of the limited information on successful treatment of these injuries, it would be beneficial for clinicians who experience similar cases to publish case reports in an international journal, describing their diagnosis, treatment, peri- and post-operative management and any complications in detail. The sharing of clinical experiences between clinicians around the world could lead to better treatment for these patients. This case report describes a case of penetrating injury from the oral cavity through the jugular foramen into the cranium, and references ten similar cases reported within the past decade.

2. Case report

A 57-year-old male prisoner attempted to commit suicide by thrusting a chopstick through the mouth into his throat during a meal. He was found lying in the prison and immediately transported to Onshi Zaidan Saiseikai Yokohama Tobu Hospital. Upon admission, he had clear mentation and no obvious signs of neurological deficit. His blood pressure was 155/100 mmHg. His medical history included myocardial infarction for which he had received medical treatment. At presentation, an electrocardiogram (ECG) showed abnormal Q waves consistent with previous myocardial infarction.

There was a 1.5-cm laceration in the patient's soft palate, through which the end of the chopstick was invisible (Fig. 1). There was no significant bleeding. A prison officer accompanying the patient produced another segment of the broken chopstick, leading to the concern that the chopstick may have crossed the mouth and passed behind the soft palate, resulting in mechanical trismus. Therefore, computed tomography (CT) was performed immediately. The CT images showed that the chopstick had penetrated the soft palate and passed through the jugular foramen into the cerebellum (Fig. 2A–D). To assess the damage to the internal jugular vein, CT angiography was performed. CT angiography images showed no active bleeding or hematoma formation (Fig. 2E and F).

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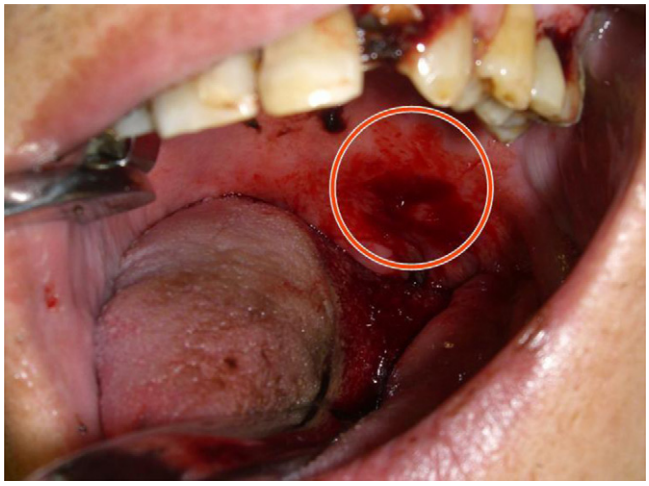

Fig. 1. Intraoral findings at initial presentation. Laceration of left soft palate caused by penetration with chopstick.

At this point, surgical removal of the foreign body from the wound was attempted under local anesthesia (2% lidocaine with 1/80,000 epinephrine). However, the foreign body was not directly palpable. The patient was then placed under general anesthesia for surgical removal in cooperation with neurosurgeons.

A conventional S-shaped skin incision was made to approach the parotid gland, and expose the trunk of the facial nerve, styloid process and internal jugular vein. An occipital craniotomy was performed to find the tip of the chopstick near the jugular foramen (Fig. 3B). The chopstick was also palpable in the connective tissue behind the styloid process. The styloid process was surgically fractured to expose the tip of the chopstick. The chopstick was then carefully withdrawn through the entry wound to prevent intracranial bleeding (Fig. 3C). Internal jugular vein hemorrhage was controlled with cautery and fibrin glue. Tissue damaged by the chopstick was resected and a duraplasty was performed with a fascial graft. The removed segment of chopstick was approximately 6 cm in length and corresponded to the other segment of chopstick presented by the prison officer (Fig. 3D).

Postoperatively, the patient was transferred to the intensive care unit (ICU) and maintained on mechanical ventilation. Cerebral edema and contusion and intracranial hematoma were identified on postoperative CT, but gradually improved. Nine days later, signs of neurological recovery were observed, including eye and limb movement and improvement in respiratory function. Three weeks post-operatively, mechanical ventilation was discontinued. No evidence of brain abscess or infection in the head and neck regions were observed at any time during the post-operative period. The patient continued to recover and was transferred to a general ward. Four years later, although the patient has clear mentation, he remains hospitalized in a rehabilitation hospital due to persistent quadriplegia.

3. Discussion

Ten cases of deep transoral penetrating foreign bodies of the intracranial space have been reported in the past 10 years [1–6,14–17]. Seven of these were pediatric cases, and six of seven cases were caused by falls while holding chopsticks in the mouth. The two adult cases were both suicide attempts, as the case reported here.

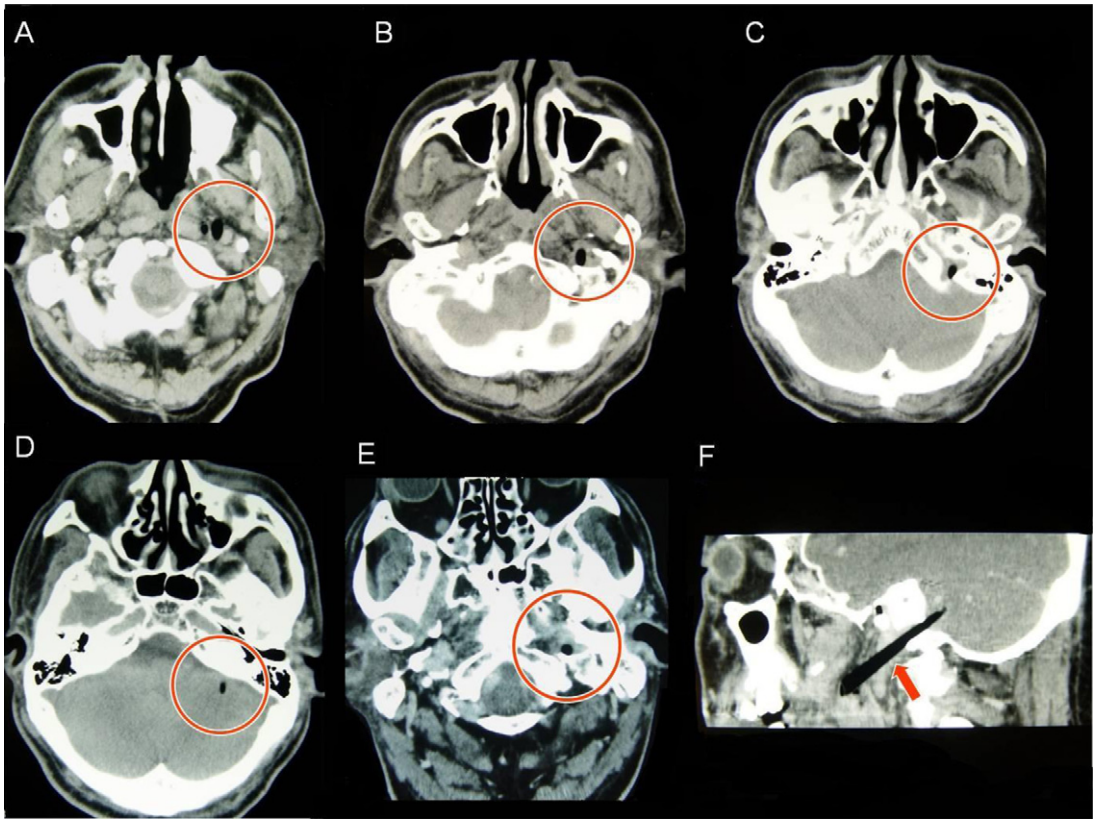

Fig. 2. Computed tomography images. (A–D) Plain CT axial images showing the foreign body as a round low-density area (inside red circle), penetrating the soft palate and passing through the jugular foramen to the cerebellum. (E and F) CT angiography images showing no active bleeding or hematoma. (E) Sagittal view enhanced CT showing the jugular foramen clearly. (F) Sagittal view enhanced CT showing the foreign body clearly.