

Impacted Foreign Body in the Anterior Nasal Cavity Presenting With Tooth Pain

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Foreign bodies pose a diagnostic challenge to clinicians, and nasal foreign bodies have the potential to lead to significant morbidity. Although foreign bodies in the nasal cavity are a commonly encountered problem in pediatric patients, a foreign body in the nasal cavity not associated with a trauma history is rare in adults. We recently experienced a 35-year-old man who presented with a foreign body in his right nasal cavity and anterior tooth pain. He was not sure what the material was, and we were not able to confirm the material type preoperatively. However, we found that a very large and thick material was impacted and totally obstructed the right anterior nasal cavity. We surgically removed it as a bone block and confirmed postoperatively that the material was glass. This case provided several lessons, and we would like to share our experience.

Keywords: Foreign body; Adult; Glass; Toothache; Nasal cavity.

INTRODUCTION

Foreign bodies offer a diagnostic challenge to clinicians, and nasal foreign bodies have the potential to lead to significant morbidity, such as dislocation, airway obstruction septal perforation, infection, and deep mucosal laceration [1,2]. It has been reported that nasal foreign bodies are more common in children than in adults, the right nasal cavity is the most common site, and common symptoms are nasal discomfort and nasal discharge [3]. The most common foreign bodies are various seeds, and plastic beads or buttons, batteries, stones, toy pieces, and food particles have also been reported to be common types [4]. We recently experienced the case of an adult patient who presented with a foreign body in his right nasal cavity and complained of concurrent tooth pain.

CASE REPORT

A 35-year-old man presented to our outpatient clinic with

tooth pain and a foreign body in the nasal cavity. He told us that something was accidentally put into his right nasal cavity one day ago, but it took place in a dark room and he did not know exactly what it was. He also complained of severe throbbing tooth pain in the anterior tooth region. He had no other medical history, including a neuropsychiatric diagnosis and trauma. On an endoscopic examination, something dark was identified in the patient's right nasal cavity; it was tightly fixed, filled the entire nasal cavity, and could not be pulled out (Fig. 1A). We inspected his teeth and oral cavity and found no abnormalities. In an X-ray of the paranasal sinus (PNS), a foreign body measuring approximately 2.5 cm×2.3 cm was identified in his right nasal cavity (Fig. 1B). It was located in a diagonal line to the nostril. We decided to perform foreign body removal under general anesthesia. As we could not initially identify the type of the foreign body material, PNS computed tomography (CT) was performed. A high-density foreign body measuring 2.7 cm×2.2 cm×1.6 cm was identified in the right anterior nasal cavity (Fig. 1C). The density was slightly higher than that of bone, and we still could not determine the type of material. Left maxillary sinusitis was also identified, and we planned to perform concomitant endoscopic sinus surgery for left maxillary sinusitis.

During surgery, we tried to remove the foreign body with crossing forceps, but the material was too hard, the surface was smooth, and the material was tightly impacted. Therefore, it was difficult to move the foreign body in an anterior

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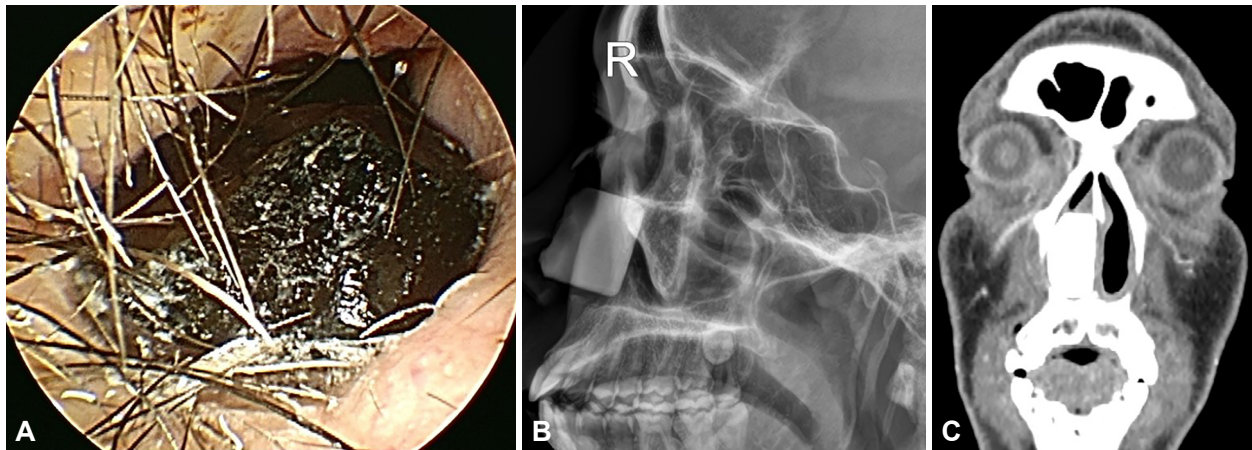


Fig. 1. Endoscopic and imaging findings of the foreign body before surgery. A: Nasal endoscopy showing a dark-colored hard material that totally obstructed the patient's right nasal cavity. B: Lateral paranasal sinus (PNS) X-ray demonstrating a foreign body measuring approximately 2.5 cm×2.3 cm in the right anterior nasal cavity. C: Coronal PNS computed tomography demonstrating high-density foreign body measuring 2.7 cm×2.2 cm×1.6 cm.



Fig. 2. Glass foreign body removed from the patient's anterior nasal cavity.

direction. As we tried to grasp it, it moved posteriorly. Therefore, we placed a thin elevator into the upper and posterior nasal cavity behind the foreign body to prevent its posterior translocation, and tried to roll it into the anterior nasal cavity. When it moved anteriorly to a minimal extent, we grasped it with crossing forceps and forced it out. After removing the foreign body, we found that it was glass (Fig. 2). As it was very hard and thick, the foreign body was not broken, and we were able to remove it as a single block. Anterior ethmo-maxillary sinusotomy was then performed in the left paranasal sinus. The nasal cavity was clear, and mild laceration was observed

after removal of the foreign body. After surgery, the patient reported that his tooth pain also improved. One day after the operation, he was discharged without any complications.

DISCUSSION

We identified several lessons from this case. First, an impacted foreign body in the anterior nasal cavity could induce tooth pain. Tooth pain of nonodontogenic causes could originate from various reasons, including referred pain from the sinonasal cavity. The anterior two-thirds of the nose are innervated by branches of the maxillary division V2 of the trigeminal nerve [5,6]. Pain perceived by the patient could actually be of sinonasal cavity origin [5]. Our patient perceived continuous throbbing tooth pain in his right anterior tooth region, and the pain was relieved after foreign body removal. Therefore, we hypothesized that the hard, large foreign body, which was impacted in the anterior nasal cavity and pushed on the nasal floor and nasal vestibule area, might have induced referred pain through stimulation of the trigeminal nerve. Second, a glass foreign body demonstrates high intensity on imaging (slightly higher intensity than bone). In our patient, the glass foreign body showed higher density than the surrounding bony structures. For foreign bodies in the nasal cavity, conventional plain radiography is usually the initial imaging modality. However, CT is the most accurate tool, particularly when a nonopaque object is anticipated or the foreign body is located inside pneumatized areas [7]. A previous study reported that cone-beam CT (CBCT) was equally accurate in visualizing metal, stone, and tooth particles. Furthermore, CBCT was better than CT in detecting glass particles in the periosteum. Magnetic resonance imaging is more sophisticated, but it cannot be applied initially in cases with a sus-

pected foreign body of unknown composition [7]. Therefore, in cases of foreign bodies in the sinonasal cavity whose composition is not accurately known, we suggest that at least CBCT should be considered as an initial imaging tool. Finally, if it is not possible to determine the type of material based on imaging, the clinician should prepare for the possibility that the material could be broken during surgical removal, especially if the foreign body is large and impacted in the nasal cavity. In our case, as the glass foreign body was tightly impacted in the anterior nasal cavity, we grasped it strongly and applied a substantial amount of strength to take it out. Fortunately, the surface of the glass material was very smooth and it was quite thick, as we identified on preoperative CT images; therefore, we were able to remove it in a single block without breaking it. If the foreign body is broken into multiple pieces, some of the pieces may not be completely removed. Glass may be present for weeks or years, causing chronic sinus pain or pain of unknown origin. Therefore, CT images should be carefully reviewed regarding the size, thickness, and condition of the surface area, and the possibility of the material breaking should be considered before surgery.

Ethics Statement

This study was approved by the Institutional Review Board of Chung-Ang University Hospital (IRB number 2301-001-19451). Getting informed consent was waived from the IRB.

Availability of Data and Material

The datasets generated during and/or analyzed during the current study are not publicly available due to the patient's privacy, but are available from the corresponding author upon reasonable request.

Conflicts of Interest

Hyun Jin Min who is on the editorial board of the *Journal of Rhinology* was not involved in the editorial evaluation or decision to publish this article. All remaining authors have declared no conflicts of interest.

Author Contributions

Conceptualization: Hyun Jin Min. **Data curation:** Jae Hyoung Choi. **Formal analysis:** Jae Hyoung Choi. **Investigation:** Hyun Jin Min. **Methodology:** Hyun Jin Min. **Project administration:** Kyung Soo Kim. **Resources:** Hyun Jin Min. **Software:** Hyun Jin Min. **Supervision:** Kyung Soo Kim. **Validation:** Kyung Soo Kim. **Visualization:** Jae Hyoung Choi. **Writing—original draft:** Jae Hyoung Choi, Hyun Jin Min. **Writing—review & editing:** Hyun Jin Min.

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