Management of an Unusual Intranasal Foreign Body Abutting the Cribiform Plate: A Case Report and Review of Literature

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Abstract
A 35-year-old man with history of schizophrenia presented three weeks after placing a screw in his nose. CT showed a screw in the right ethmoid sinus abutting the cribiform plate. While most nasal foreign bodies occur in children and are removed at the bedside, intranasal foreign bodies in adults often require further assessment. Due to a concern for skull base defect, the patient was brought to the OR for removal of the screw. With possible skull base or intracranial involvement, it is important to evaluate the mechanism of injury and intervene in a controlled environment.

Introduction
Intranasal foreign body is a common chief complaint among the pediatric population. There were 6,418 cases (3.2%) in a 5-year nationwide study of all ED visits and only 214 involved adults.[1] Certain foreign bodies such as button batteries and sharp objects require careful evaluation. Due to the low incidence of intranasal foreign bodies among adults with different mechanisms of injury, most literature report individual cases. Here, we present an adult patient who inserted a screw into his ethmoid sinus that involved the anterior skull base.

Case Report
The patient is a 35-year-old male with schizophrenia who presented with a screw he placed in his right nostril three weeks prior. He reported hearing voices that told him to put the screw in his nose. He had a history of ingesting part of a can that required exploratory laparotomy for removal. He denied fever, nasal drainage, pain or vision changes. CT Head confirmed the foreign body with dehiscence of anterior cranial fossa prior to transfer to our institution.(Figures 1,2)

The patient was stable upon arrival and CT angiography did not reveal any intracranial vascular injury. MRI was deferred due to the potential interference of a screw in the magnetic field. Cultures were taken and intravenous antibiotics were started. Neurosurgery, Psychiatry, and Infectious Disease were consulted. The patient later underwent an elective right maxillary antrostomy, total ethmoidectomy and frontal sinusotomy with removal of anterior skull base foreign body. The screw was found to be covered in plastic. It was displaced inferiorly away from the skull base and maneuvered out of the nasal cavity. The skull base was inspected with no visible defect or cerebral spinal fluid leak. Surgicel and Evicel tissue glue was applied and held with Nasopore. The patient was discharged on post-operative day #2 on oral antibiotics.

Outpatient, the patient appeared well with repeat CT showing persistent elevation of the skull base.(Figure 3) MRI showed leptomeningeal enhancement but no pathologic concerns such as encephalcele.(Figure 4) He was seen six months later with no complaints. Ethmoid and frontal sinuses were patent but the maxillary os was not visible and there was synchia noted between the septum and inferior turbinate.(Figure 5) The patient has since been lost to follow up.

Discussion
Many reports of endoscopic removal of foreign bodies have been made since the advancement of transnasal endoscopic surgery in the 1980s. Pagella et al. also demonstrated endoscopic retrieval of dental implants using trocars.[2] These objects are often a result of accidental falls or projectiles with few as a result of intentional placement. Dodson et al. presented another case of a patient with schizophrenia that similarly placed multiple objects into the sinuses through the site of a molar extraction. Endoscopic retrieval of the objects involved creating a larger skull base defect with one foreign body that penetrated the ethmoid roof.[3]

There are many possible sequelae of these cases. Foreign bodies that violate the skull base can cause meningitis, brain abscess, CSF leak, and neural or vascular injury. Foreign bodies in the paranasal sinuses can cause chronic inflammation, cutaneous fistula, rhinolith, lead poisoning, and chronic pain.[3,4,5] While foreign bodies such as bullets are often left in soft tissue elsewhere in the body, most intranasal foreign bodies are removed due to increased risk for infection.[5,6] There are conflicting recommendations regarding prophylactic antibiotics but most favor antibiotic use.[6]

In one retrospective review of 13 retained metallic foreign bodies in the sinuses and/or skull base, three had involvement of the skull base like our patient.[6] The authors recommended that objects that are safely accessible and at risk for infectious complications should be removed. Due to the unique nature of each injury and the scarcity in which they present, there is little evidence-based protocol for the management of these injuries. However, Yarlagadda et al. proposed an algorithm based on their 10-year retrospective review.(Figure 6) In conclusion, we present a case of leptomeningeal enhancement due to an intranasal foreign body.

Conclusions
A skull base defect or intracranial involvement may not be apparent when evaluating a patient with an intranasal foreign object. Conversely, a patient with suggestive imaging may not have an alarming clinical presentation. In this case, the patient’s history and initial imaging was concerning for the need to repair a skull base defect. However, his ultimate outcome was benign. It is important to utilize appropriate resources in planning the management of these patients. Most patients will require operative exploration and possible repair.

References

Images:
- Figure 1: Intranasal screw with tip displacing the cribiform plate.
- Figure 2: Preop CT with radiopaque screw displacing anterior skull base.
- Figure 3: Postop CT with persistent elevation of anterior skull base.
- Figure 4: Leptomeningeal enhancement but no encephalocele or other pathology.
- Figure 5: Patent ethmoid and frontal sinus postop.

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