

Case Report

Endoscopic trans-nasal removal of impacted bullet in the sphenoid sinus: a case report

Wijaya Juwarna^{1*}, Delfitri Munir²

¹Departement of Otorhinolaryngology, Murni Teguh Memorial Hospital and ²USU Hospital, Medan, Indonesia

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***Correspondence:**

Dr. Wijaya Juwarna,

E-mail: wijayajuwarna@yahoo.com

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ABSTRACT

Foreign body of the sphenoid sinus is a rare condition and most of the documented cases are shrapnel wounds. The most cases of sinuses foreign bodies are in maxillary and frontal sinus. Very few cases have been reported of lodgment of foreign body in paranasal sinuses. Garces and Norris reported that 70% of these foreign bodies usually appeared after maxillofacial traumas and 30% appeared during or after dental procedures of maxilla. A bullet impacted in the sphenoid sinus case in nineteen-year-old man was reported involving the anterior skull base. The bullet was safely removed with the trans-nasal endoscopic approach preserving the structures around the sphenoid sinus. Proximity of the sphenoid sinus to vital structures such as the optic nerve and internal carotid artery may render life-threatening complications. Adequate knowledge of the anatomical variations with regard to the sphenoid sinus and good preoperative planning are essential to ensure safe removal of foreign bodies, thereby avoiding catastrophic complications.

Keywords: Bullet, Sphenoid sinus, Endoscopic trans-nasal

INTRODUCTION

The occurrence of foreign body impaction in sphenoid sinus is extremely rare.¹⁻⁵ The maxillary sinus was affected in 75% cases and the frontal sinus is about 18%. Involvement of the ethmoid or sphenoid sinus is rare. A great variety of foreign bodies can be found in the paranasal sinuses. These may include wood, cotton, gauze, bullet, shrapnel, glass pieces, and bone wax.⁴ Foreign bodies reach the sphenoid sinus either through the orbit or the nasal cavity. Proximity of the sphenoid sinus to vital structures such as the optic nerve and internal carotid artery may render life-threatening complications. Removal of such foreign bodies requires good preoperative planning, sound anatomy, and knowledge of variations of the sphenoid sinus. Foreign bodies reach the sphenoid sinus either through the orbit or the nasal cavity. Proximity of the sphenoid sinus to vital structures such as the optic nerve and internal

carotid artery may render life-threatening complications. Removal of such foreign bodies requires good preoperative planning, sound anatomy, and knowledge of variations of the sphenoid sinus.⁵ Accessing the sphenoid sinus and removing the foreign body lodged in it would be a big challenge to any surgeon.⁶ We present a case of an impacted bullet in the sphenoid sinus after a weasel hunting accident and the trans-nasal endoscopic approach was used.

CASE REPORT

A 19-year-old gentleman was hit in the left-sided nose after a weasel hunting accident in August 2020 and complain of left-sided headache without loss of consciousness. Physical examination after three weeks revealed a slightly visible entry wound or scar was seen in the left-sided nose (Figure 1).



Figure 1: A slightly visible entry wound or scar was seen in the left-sided nose.

CT scan revealed a metallic artifact seen in the sphenoid sinus involving the anterior skull base (Figure 2 A and B).

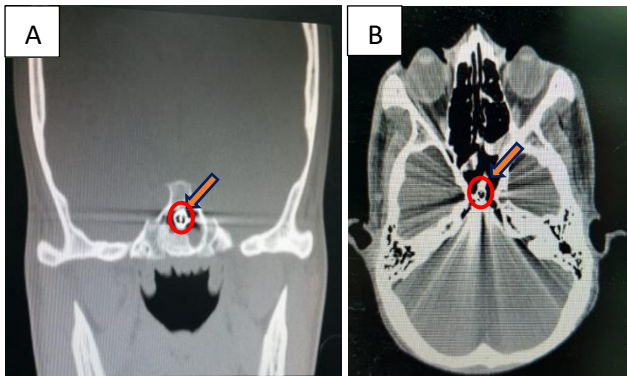


Figure 2 A and B: Coronal and axial CT revealed metallic artifact in the sphenoid sinus.

In 2nd September 2020, the patient underwent trans-nasal endoscopic removal of the bullet lodged in the sphenoid sinus involving the anterior skull base (Figure 3).



Figure 3: Intraoperative endoscopic picture of the bullet in sphenoid sinus.

Intraoperative findings of the bullet position were correlated with the CT scan findings. Removal of the

bullet was done by initially reduction the left middle turbinate and performed trans ethmoid sphenoidotomy. Bullet was dislodged very gently to the center of the sphenoid sinus using a seeker and full smoothly extraction using a straight forceps (Figure 4 A, B and C). Minimal cerebrospinal fluid leak was observed and minimal bleeding was seen.

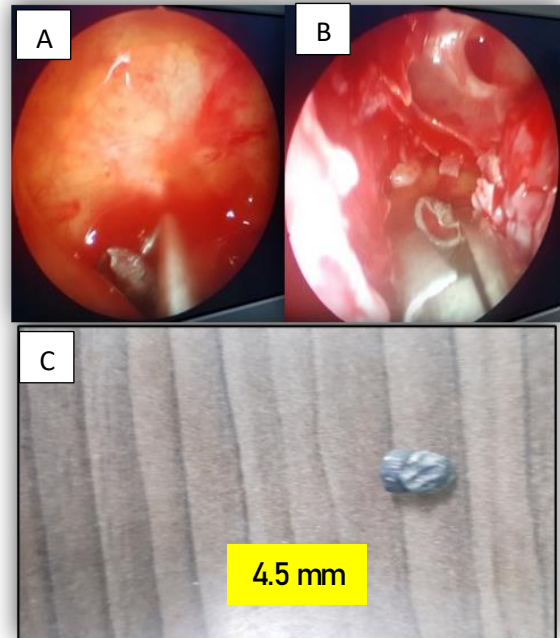


Figure 4: (A) Using sphenoid seeker removing the bullet to the center of sphenoid sinus and, (B) full smoothly extraction with a straight forceps, (C) the 4.5 mm bullet.

DISCUSSION

Foreign body of the sphenoid sinus is a rare condition. The sphenoid sinuses lie deep within the skull and behind the ethmoid air cells. The orbit, frontal and maxillary sinuses are the most commonly involved structures with penetrating foreign bodies. One study documented four sphenoid sinus foreign bodies out of 26.000 war wounds. Thus, foreign body lodged in the sphenoid sinus is a rare condition.⁴

The main and most important diagnostic procedure available is CT Scan of the head which can localize the foreign body as well as demonstrate bone fragments and other lesions. Coronal CT sections provide good views of the sphenoid and adjacent paranasal sinuses and possible intracranial penetration. Magnetic resonance imaging (MRI) is a usually less informative diagnostic procedure for adequate imaging of bones. Lastly, CT Scan can guide the surgical approach for extraction. Craniofacial CT Scan in our patient revealed the opaque foreign body within the sphenoid sinus. The CT Scan was helpful in localizing the foreign body and revealing involvement of

other structures such as bones and sinuses. It also showed that the foreign body could be removed with endoscopic trans-nasal approach.⁴

It is very common to see a foreign body in the nasal cavity or in the external ear canal but seeing it in likely places like the sphenoid sinus is such a surprise. Many factors need to be considered in the decision to extract it. One factor to consider is the approach to the sphenoid sinus. There are two different approaches to the sphenoid sinus: external and internal. The external, trans-ethmoidal approach involves subperiosteal elevation and ethmoidectomy.⁷ Internal approaches such as the trans-septal and trans-nasal are less invasive way to access the sphenoid sinus. Because of ease in access, minimal damage to surrounding mucosa and good exposure, the trans-nasal approach was used.⁸ Whatever approach the surgeon chooses, it is important to be familiar with surgical anatomy to prevent unwanted complications. Creativity also played a role in this procedure and quick thinking was needed since the foreign body was a round object and extracting it from such a limited space with utmost care using makeshift instruments was critically challenging.

CONCLUSION

Foreign body of the sphenoid sinus is a rare condition. Adequate imaging is important for localization and planning the optimal surgical approach for sphenoid sinus foreign bodies. Trans-nasal endoscopic approach proves an effective and safe technique for the removal of these foreign bodies and repair of the skull base defect.

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REFERENCES

1. Azwan NAB, Shanugam RKS, Teng KY. A nearly missed foreign body in frontal sinus. Int J Otorhinolaryngol Head Neck Surg. 2020;6(2):425-7.
2. Sharma R, Minhas R, Mohindroo N. An unusual foreign body in the paranasal sinuses. Indian J Otolaryngol Head Neck Surg. 2008;60(1):88-90.
3. Ramadass T, Prabhakaran M, Kumar VS. Air-rifle bullet in the sphenoid sinus. Air-rifle bullet in the sphenoid sinus. Indian J Otolaryngol Head Neck Surg. 1996;48:51.
4. Mendoza DJC, Chua AH, Castaneda SS. Transorbital removal of foreign body in the sphenoid sinus. Phillip J Otolaryngol Head Neck Surg. 2014;29(2):19-21.
5. Padiyar BV, Vats A, Dhiman A, Rai AK. Impacted bullet in the sphenoid sinuses. Dubai Med J. 2019;2:17-9.
6. Javierto AB, Hernandez JG, Roldan RA. Foreign body in the sphenoid sinus. Phillip J Otolaryngol Head Neck Surg. 2014;29(2):46-7.
7. Stamberger H, Hawke M. Surgical Operative Technique. Hurley R Editor. Essential of Functional Endoscopic Sinus Surgery. Missouri: Mosby. 1993;172.
8. Sharma R, Minhas R, Mohindroo N. An unusual foreign body in the paranasal sinuses. Indian J Otolaryngol Head Neck Surg. 2008;60(1):88-90.

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