

# Technique for Foreign-Body Removal with the Use of Transnasal Endoscopic Prelacrimal Approach - A Case Report

Matteo Alicandri-Ciuffelli, Federico Calvaruso, Livio Presutti<sup>1,2</sup>, Giulia Molinari<sup>1,2</sup>

Department of Otorhinolaryngology, Head and Neck Surgery, University Hospital of Modena, Modena, <sup>1</sup>Department of Otolaryngology Head and Neck Surgery, IRCCS Azienda Ospedaliero Universitaria di Bologna, <sup>2</sup>Department of Specialist, Diagnostic and Experimental Medicine, Alma Mater Studiorum University, Bologna, Italy

## Abstract

**The Rationale:** Foreign body (FB) in the nasal cavities is a frequent cause of otolaryngology emergency consultation that sometimes requires surgical treatment. When there is involvement of the posterolateral wall of the maxillary sinus (MS) and of the pterygopalatine fossa (PPF), conventional techniques such as antrostomy and medial endoscopic maxillectomy may not allow sufficient domination of the surgical field. **Patient Concerns:** We report the case of a woman who suffered from intranasal trauma with epistaxis and pain. **Diagnosis:** A computed tomography scan revealed a metallic FB at the level of the right posterolateral wall of the MS, PPF, and greater wing of the sphenoid bone. **Treatment and Outcome:** A minimally invasive transnasal endoscopic prelacrimal approach was chosen for its removal. **Take-away Lessons:** The postoperative recovery was rapid and without complication.

**Keywords:** Foreign body, maxillary sinus, pterygopalatine fossa, skull base, sphenoid bone

## INTRODUCTION

The removal of a foreign body (FB) from the nasal cavities could be managed in an office-based setting, especially if the patient is compliant and the object is easily identifiable. However, when the FB is difficult to visualise and the paranasal sinuses or noble structures (vessels or nerves) are involved, endoscopic or open surgical exploration under general anaesthesia is indicated.<sup>[1-4]</sup>

A case of a woman who suffered from endonasal trauma by a pin, which got stuck in the right posterolateral wall of the maxillary sinus (MS), pterygopalatine fossa (PPF), and greater wing of the sphenoid bone (SB), is herein reported. A transnasal minimally invasive endoscopic prelacrimal approach (EPLA) was chosen for its removal, with the aim of guaranteeing the best possible result while preserving the anatomy of the nasal cavity, the middle turbinate, and the osteomeatal complex. Since Zhou *et al.* first described the EPLA in 2013, this approach has never been used for FB removal. Technical nuances and advantages for this new indication of prelacrimal approach are discussed.

## CASE REPORT

A 55-year-old female gardener came to the emergency room reporting that during her gardening, she received nasal trauma from a FB blown from the ground and suddenly started to feel a FB sensation into her right nasal fossa, followed by monolateral nose bleeding and temporomandibular pain.

A maxillofacial computed tomography (CT) scan pointed out the presence of a highly hyperdense linear signal (consistent with a metallic FB) passing across the lateral portion of the posterior wall of the right MS, protruding into the lateral part of PPF and sticking into the greater wing of SB [Figure 1]. The nasal pyramid appeared normal, with intact skin and no sign of nasal bone fractures. A flexible fiberoptic rhinolaryngoscopy showed mucosal abrasion of the right nasal floor and

**Address for correspondence:** Dr. Federico Calvaruso, Department of Otolaryngology, Head and Neck Surgery, University Hospital of Modena, Largo del Pozzo, 71, 41125 Modena, Italy. E-mail: fedecalva@gmail.com

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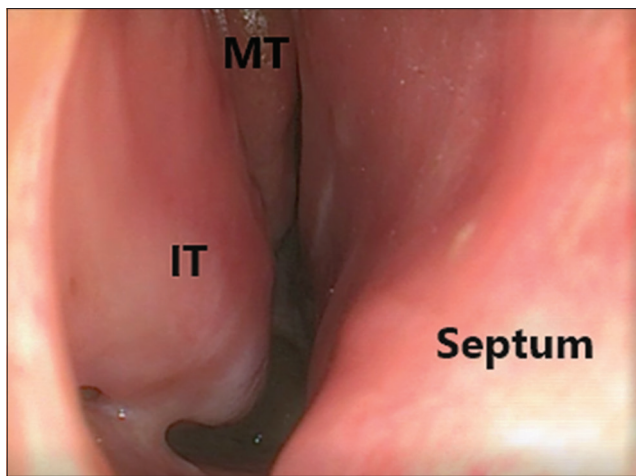
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**Figure 1:** Preoperative computed tomography scan. (a) Axial view; (b) Sagittal view. The metallic foreign body extends from the most lateral part of the posterior wall of the maxillary sinus to the pterygopalatine fossa, close to the pterygomaxillary fissure, and the greater wing of the sphenoid bone



**Figure 2:** Three-dimensional skull model showing the area of drilling on the lateral wall of the right nasal cavity (yellow) for endoscopic prelacrimal approach



**Figure 3:** Endoscopic view of the right anterior nasal cavity at 6-month follow-up. IT = inferior turbinate; MT = middle turbinate

ipsilateral Hasner's valve region. However, due to blood clots, the exact access point of the FB was not clearly visible. Considering its extension and position on CT, a minimally

invasive EPLA under general anaesthesia was performed. The equipment consisted of a 0.4-mm diameter, 18-cm length rigid endoscope connected to a 3-chip 4K-HD camera (Karl Storz, Tuttlingen, Germany) and standard set of instruments for endoscopic paranasal sinus surgery. After decongestion and medial dislocation of the inferior turbinate (IT), a preliminary overview of the right nasal fossa revealed the entry point of the FB in the middle third of the lateral wall of the inferior meatus. A vertical mucosal incision of the lateral nasal wall, anterior to the IT's head, was performed, followed by progressive mucosal dissection from the periosteum. Then, drilling of the lateral bony wall between the Hasner's valve and the pyriform aperture [Figure 2] through a diamond drill leads to entry into the MS and identification of the FB (a 1-cm long pin fragment). The exposure of the lateral posterior wall of the sinus allowed adequate area of manoeuvring for its gentle removal by Weil nasal forceps. Haemostasis around the hole in the posterolateral sinus was performed using bipolar forceps, the diamond drill, and Tabotamp. The IT was repositioned and the mucosal incision was sutured with resorbable stitches. Postoperative CT scan showed normal surgical outcomes and the patient was discharged the following day with topical medical treatment, and paracetamol as needed. At 6-month follow-up, the patient denied epiphora, nasal crusting or discharge, and only referred residual mild numbness at the maxillary branch of the trigeminal nerve, that had improved during the postoperative period. The endoscopic examination was regular, and the nasal cavity anatomy was intact, as shown in Figure 3.

## DISCUSSION AND CONCLUSION

The presence of a FB inside the nasal cavity is a condition that the otolaryngologist is frequently required to diagnose and treat during emergency consultations.<sup>[5,6]</sup> In case of deep FB injury, potentially any paranasal sinus could be involved, and clinicians should keep a high index of suspicion for possible intracranial injury as well. This alert is particularly important when the patient has impaired neurological status (e.g., ophthalmoplegia, seizures), is febrile, and shows epistaxis of not clear origin or cerebrospinal fluid leak.<sup>[6,7]</sup> Vascular injury could also occur, with internal carotid artery involvement representing a major risk for death.

As in our case, there may be no evidence of FB during endonasal examination, despite sinonasal symptoms. Head and maxillofacial CT scan represents the gold standard. As in most cases, it allows to identify and precisely locate it, defining its relationships with surrounding structures.<sup>[7]</sup> Moreover, CT scan could suggest if further imaging (e.g., CT angiography) is warranted for evaluation of major vascular injuries, and the trajectory delineation is pivotal to both identify concomitant injuries and forecast potential risks related to the removal.<sup>[1-8]</sup> In our case, the CT scan was sufficient for FB detection and to assess the involvement of the most lateral part of the PPF and the greater wing of the SB. Considering that the FB into the nasal sinuses alters the physiological tissue-air interface, increasing the potential for infection, and that some

materials (such as lead) may carry a risk for poisoning, removal of the FB is recommended whenever feasible.<sup>[7-9]</sup>

Timing for removal is extremely variable in the literature, depending on the clinical presentation and severity of concurrent complications. In the present authors' opinion, even in cases of stable patients without major maxillofacial or neurological injuries, removal should be carried out as soon as possible.

In this case report, an EPLA was chosen. Since 2013 when Zhou *et al.*<sup>[4]</sup> first reported it, the EPLA to the MS has never been used to target sinonasal FB. Removal of antrochoanal polyps and inverted papillomas, as well as treatment of maxillary/PPF/infratemporal fossa tumours, has been mentioned as indication for this approach.<sup>[10]</sup> This technique, with no external incision and very limited bone removal, is a minimally invasive alternative to classic approaches to the MS, such as endoscopic maxillectomy, open maxillectomy, intranasal or external Denker approach, midfacial degloving, or combined approaches. The mini-invasiveness of EPLA is owed to the preservation of several structures: the middle and IT, the nasolacrimal duct, the osteomeatal complex, and the whole lateral nasal wall. This gives an account of the limited postoperative morbidity of this approach, as confirmed by our surgical outcome.<sup>[2-4]</sup> Further, EPLA opens a straight window toward the most lateral part of the PPF through which potential complications, such as bleeding from terminal branches of the maxillary artery, could be managed with the endoscope. In our specific case, the proximity to the pterygomaxillary fissure may place the terminal part of the maxillary artery and the posterior superior alveolar nerve at risk. Fortunately, no bleeding or permanent numbness in the molar region occurred, mainly because the removal from the PPF was smooth and the fossa itself had not been explored. The main complications of EPLA consist of epiphora and pain in the superior alveolar region. The latter, the only condition present in the 6-month follow-up, could be as much a surgical outcome as it could depend on the trauma of the FB itself.

In conclusion, our report shows the feasibility and safety of EPLA as a minimally invasive route for removal of a FB stuck in the posterolateral wall of the MS, even with involvement of the PPF and SB.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understand that name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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## Conflicts of interest

There are no conflicts of interest.

## REFERENCES

1. Lee DH, Seo BR, Lim SC. Endoscopic treatment of transnasal intracranial penetrating foreign body. *J Craniofac Surg* 2011;22:1800-1.
2. Arosio AD, Valentini M, Canevari FR, Volpi L, Karligkiotis A, Terzakis D, *et al.* Endoscopic endonasal prelacrimal approach: Radiological considerations, morbidity, and outcomes. *Laryngoscope* 2021;131:1715-21.
3. Presutti L, Marchioni D, Trani M, Ghidini A. Endoscopic removal of ethmoido-sphenoidal foreign body with intracranial extension. *Minim Invasive Neurosurg* 2006;49:244-6.
4. Zhou B, Han DM, Cui SJ, Huang Q, Wang CS. Intranasal endoscopic prelacrimal recess approach to maxillary sinus. *Chin Med J (Engl)* 2013;126:1276-80.
5. Ramotar H, Jaber MC, Koo Ng NK, Pulido MA, Saleh HA. Image-guided, endoscopic removal of migrated titanium dental implants from maxillary sinus: Two cases. *J Laryngol Otol* 2010;124:433-6.
6. Chan SK, Pang KY, Wong CK. Transnasal penetrating intracranial injury with a chopstick. *Hong Kong Med J* 2014;20:67-9.
7. Nguyen HS, Oni-Orisan A, Doan N, Mueller W. Transnasal penetration of a ballpoint pen: Case report and review of literature. *World Neurosurg* 2016;96:611.e1-10.
8. Wu X, Li A, Tan J, Ou X. Removal of orbital-maxillary sinus-ptyergopalatine fossa foreign body with external and endoscopic combined approach. *J Craniofac Surg* 2014;25:1547-9.
9. Brinson GM, Senior BA, Yarbrough WG. Endoscopic management of retained airgun projectiles in the paranasal sinuses. *Otolaryngol Head Neck Surg* 2004;130:25-30.
10. Lin YT, Lin CF, Yeh TH. Application of the endoscopic prelacrimal recess approach to the maxillary sinus in unilateral maxillary diseases. *Int Forum Allergy Rhinol* 2018;8:530-6.