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Iatrogenic Middle Turbinate Dislocation as a Rare Differential Diagnosis of Unilateral Persistent Nasal Obstruction

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Abstract

Nasotracheal intubation is routine for oral and oropharyngeal procedures, and provides the advantages of enhanced surgical exposure and a secure airway. Complications are usually transient, i.e., epistaxis or mucosal trauma, while severe issues like turbinate dislocation are uncommonly encountered yet may masquerade as a sinonasal tumor or inflammation and pose diagnostic dilemma. The literature records paucity of information and sparse documentation on iatrogenic turbinate dislocation. The present case presents a 37-year-old male who complained of unilateral right-sided post-operative nasal obstruction and repeated epistaxis after dental surgery that required nasotracheal intubation. Endoscopy showed posterior displacement of the right middle turbinate inducing complete choanal obstruction, and a 2.2 × 1.6 cm mass-like lesion mimicking a nasopharyngeal tumor was seen on CT and MRI. Diagnosis was made on interlocking endoscopic and radiological evaluation. Definitive therapy by septoturbinoplasty and resection reversed the signs and symptoms completely and no recurrence became evident on follow-up. The present case points out that iatrogenic middle turbinal dislocation must be included in the differential for unilateral nasal obstruction and underscores the necessity for meticulous history, endoscopy, and imaging to prevent mistreatment and misdiagnosis.

Keywords: Intubation, Iatrogenic Disease, Nasal obstruction, Nasopharyngeal Diseases, Epistaxis, Turbinates, Diagnosis.

1. Introduction

Nasotracheal intubation is a technique that is best chosen for oral and oropharyngeal procedures for stabilizing the airway and surgical exposure of the oral cavity (Hashemi et al., 2023). There is a characteristic advantage in that jaw and mouth areas are provided with unlimited access, a necessity for certain procedures that involve laryngeal microsurgery or reconstructive surgery within the oral cavity. It is preferred for cervical spine instability or fixation patients due to the limitation of movement within the neck, and for those situations where intubation would have to be maintained for a significant duration for intensive management (Hashemi et al., 2023). The advantages of nasotracheal intubation are that one maintains a clear operative field, reduces interference with the procedure being done surgically, and obtains better surgical exposure. It also reduces the likelihood of some airway obstructions that are likely to arise from orotracheal intubation, especially in those procedures where one has to maintain the oral cavity freely available (Tsukamoto et al., 2018). The common complications for nasotracheal intubation are, however, epistaxis (nosebleeds) due to Kiesselbach's plexus laceration, sinusitis, nasal necrosis, and mucosal trauma (Kido et al., 2019). Some of the other complications are sinusitis, middle-ear problems that arise due to mucosal edema at the level of the nasopharyngeal region, and superficial necrosis at the level of the nasal ala. As a means to prevent some of the complications mentioned above, various measures such as appropriate insertion techniques and use of vasoconstrictive agents have been suggested (Yamamoto et al., 2019).

Major complications of nasotracheal intubation, for example, turbinate dislocation or avulsion, are extremely rare in direct comparison with more generalized minor complications such as epistaxis. Although epistaxis represents the most common complication, a condition of severe nasal trauma such as turbinate dislocation represents a rare event, occurring infrequently with some reports indicating a rate significantly less than 1%. For instance, Chauhan & Acharya present a situation where epistaxis

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represents a common complication without indicating a high prevalence for traumatic injuries, in turn, suggesting the latter are rare (Chauhan & Acharya, 2016). Likewise, Tan & Dennis, highlight rates for general complications without noting severe nasal trauma, again serving to reinforce the latter are relatively infrequent (Tan & Dennis, 2018). As a whole, serious nasal trauma such as turbinate dislocation or avulsion are exceptionally rare events within a field of nasotracheal intubation, with a vast majority of complications being minor and temporary.

Rare iatrogenic complications of the nasal cavity, for instance, turbinate dislocation, may present a great diagnostic hurdle given the overlapping nature of their signs and symptoms with those presented in more benign diseases of the sinonasal tract (Lo Casto et al., 2024). Patients present with unilateral chronic nasal obstruction, epistaxis, or headache, and these are non-specific signs presenting in deviated septum, turbinate hypertrophy, sinonasal polyps, or indeed malignant lesions. Overlapping signs and symptoms readily blur the underlying cause particularly if a peroperative history cannot be fully ascertained (Lo Casto et al., 2024).

Radiologic findings render diagnosis even more equivocal. Avulsed fragments or displaced turbinate material on CT or MRI are seen as polypoidal or hyperdense masses and exhibit an appearance that cannot be differentiated from benign or malignant nasopharyngeal tumors, inflammatory polyps, or other soft-tissue lesions (Giannitto et al., 2024). Without proper correlation between clinical history, endoscopy of the nasal tract, and radiologic correlation, such a case is likely to be inappropriately diagnosed as neoplastic or inflammatory disease with resultant late or inappropriate management (Giannitto et al., 2024).

Iatrogenic middle turbinate dislocation is an extremely rare side effect of nasotracheal intubation that is a great diagnostic puzzle. As different from common complications like epistaxis, turbinate displacement often presents with nonspecific findings such as unilateral nasal obstruction, headache, or epistaxis that are dramatically similar to the common entities such as deviated septum, turbinate hypertrophy, nasal polyps, or even nasopharyngeal tumors. The radiological morphology may add to the confusion since displaced turbinate tissue may present a mass-like appearance on MRI or CT, thus risking unnecessary treatments and diagnostic confusion. Though complications arising from nasotracheal intubation have been quite vigorously documented, severe iatrogenic trauma to the nose such as turbinate dislocation has very sparse reports in literature and therefore a gap persists as far as awareness at a bedside level and direction for diagnosis are concerned.

This case report aimed to present the clinical course, diagnostic procedure, and surgical management of a 37-year-old male who presented with fixed right-sided nasal obstruction and a mass-like lesion in the nasopharynx on imaging after nasotracheal intubation and thus highlight the significance of considering iatrogenic turbinate dislocation in the unilateral persistent nasal obstruction differential diagnosis to prevent misdiagnosis and ensure appropriate management at the right time.

2. Case Presentation

2.1. Clinical History and Presentation

A 37-year-old medically fit man was referred for the assessment of a nasopharyngeal mass that identified incidentally on a sinus CT undertaken for nasal blockage. He complained of fixed right-sided nasal obstruction and occasional hemoptsis, which he started three years before the current visit for nasotracheal intubation for a dental procedure. Patient informed us that he has been on nasal sprays intermittently for two years, but the symptoms did not improve. There was no history of other nasal trauma, rhinorrhea, postnasal drip, headache, facial pressure, olfactory loss, or allergy. There was no family history or previous history of sinonasal disease.

2.2. Pre-Medical Management

The patient received budesonide nasal spray and sodium chloride spray (one spray each nostril twice a day for two months), repeated intermittently for the past two years. These treatments did little to alleviate the symptoms.

2.3. Endoscopic Examination

Rigid nasal endoscopy with a 0° Hopkins rod telescope (4 mm) identified a paradoxically deviated nasal septum with left-sided inferior deviation, a displaced maxillary crest and right-sided dorsal deviation. The inferior turbinates were bilaterally hypertrophied. The right middle turbinate was posteriorly displaced and totally obstructing the right choana.

2.4. Radiological Findings

Thin-cut (1 mm) sinus CT demonstrated a hyper-dense tubular structure that filled the right posterior nasal cavity and projected into the nasopharynx, which was approximately 2.2 × 1.6 cm (Figure 1A and B: coronal

anterior and posterior cuts; Figure 1C: sagittal cut). MRI demonstrated a peripherally calcified polypoidal mass at the right posterior choana and projecting into the nasopharynx (Figure 2). Correlating the radiological and clinical findings, the general impression was posterior displacement of the right middle turbinate due to traumatic nasotracheal intubation.

2.5. Preoperative Management and Consent

The results and management were discussed with the patient in meticulous detail. For the persistent symptoms and radiologic evidence, surgical management was advised. The patient gave informed consent for septoturbinoplasty and excision of the right middle turbinate that was displaced.

2.6. Surgical Procedure

Smooth orotracheal intubation was achieved with a 7 mm internal diameter endotracheal tube under general anesthesia. The patient was placed in reverse Trendelenburg and prepared aseptically in the nasal cavity. Endoscopic re-evaluation confirmed preoperative evidence (Figure 3a). The region along the septum, floor of the nose, and right middle turbinate was infiltrated with lidocaine and epinephrine (1:1000000) for hemostasis and hydro-dissection (Figure 3b). The septoplasty procedure was initially followed by cauterization at the base of the right middle turbinate using bipolar diathermy. The turbinectomy scissors were then used for delivering a few cuts and resecting the turbinate (Figure 3c). The resected turbinate was taken for gross documentation (Figures 3d and 3e). The procedure was finally completed without any intraoperative and immediate postoperative complications and the patient was discharged on the same day.

2.7. Postoperative Course and Follow-Up

On one-week follow-up postoperative, the patient reported complete clearance of right-sided nasal obstruction. Endoscopy revealed bilaterally patent nasal cavities with a normally patent right choana and nasopharynx (Figure 4). No other drug therapy was advised, and the patient required no preventive management. He was discharged from follow-up in ENT in a healthy state.

2.8. Outcome

The patient's symptoms fully resolved after surgical management and no recurrence was seen on follow-up. The present case draws attention to the diagnostic dilemma of iatrogenic turbinate dislocation presenting as a mass lesion radiologically and clinically and the need to include it among one of the few rare differential diagnoses for unilateral persisting nasal obstruction.

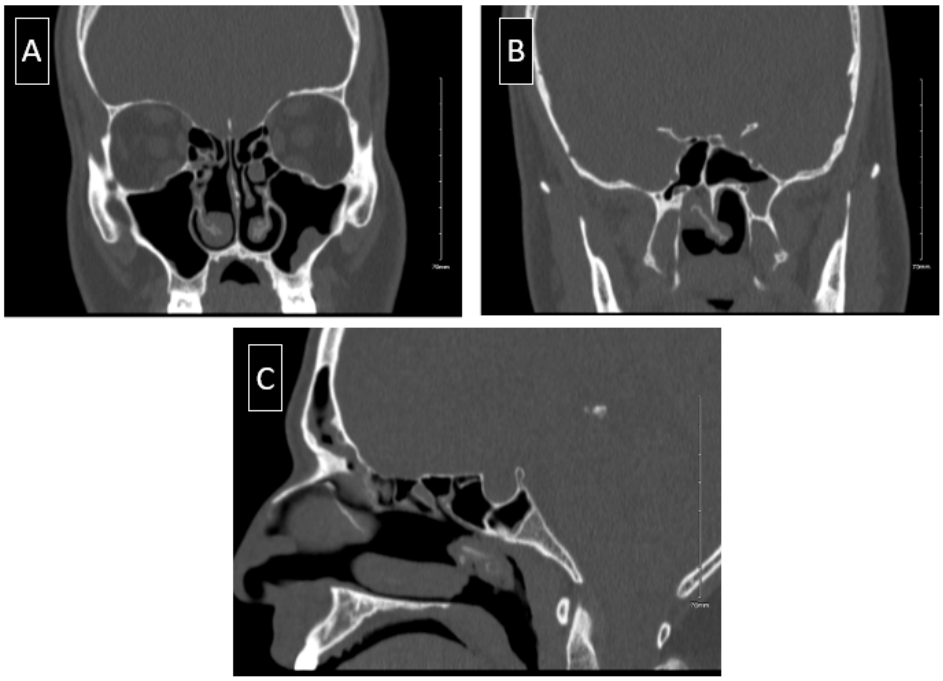

Figure 1: Coronal and sagittal CT images of the paranasal sinuses. (A) Coronal view showing the nasal cavity and surrounding structures. (B) Coronal view highlighting the left maxillary sinus. (C) Sagittal view providing a detailed look at the nasal passage and sinuses.

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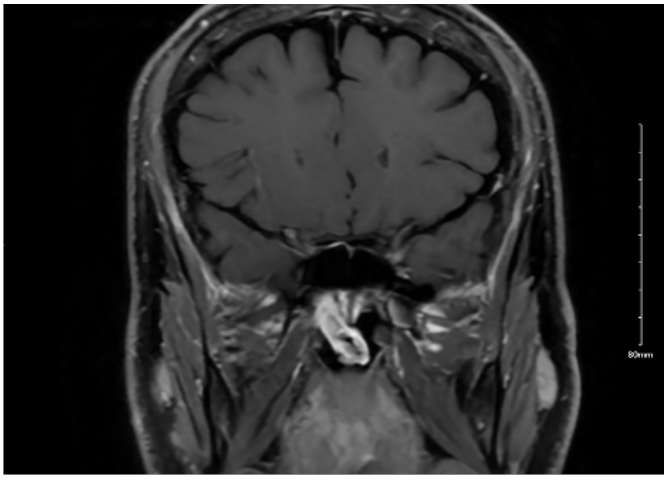

Figure 2: Coronal MRI image of the brain showing the cerebral hemispheres.

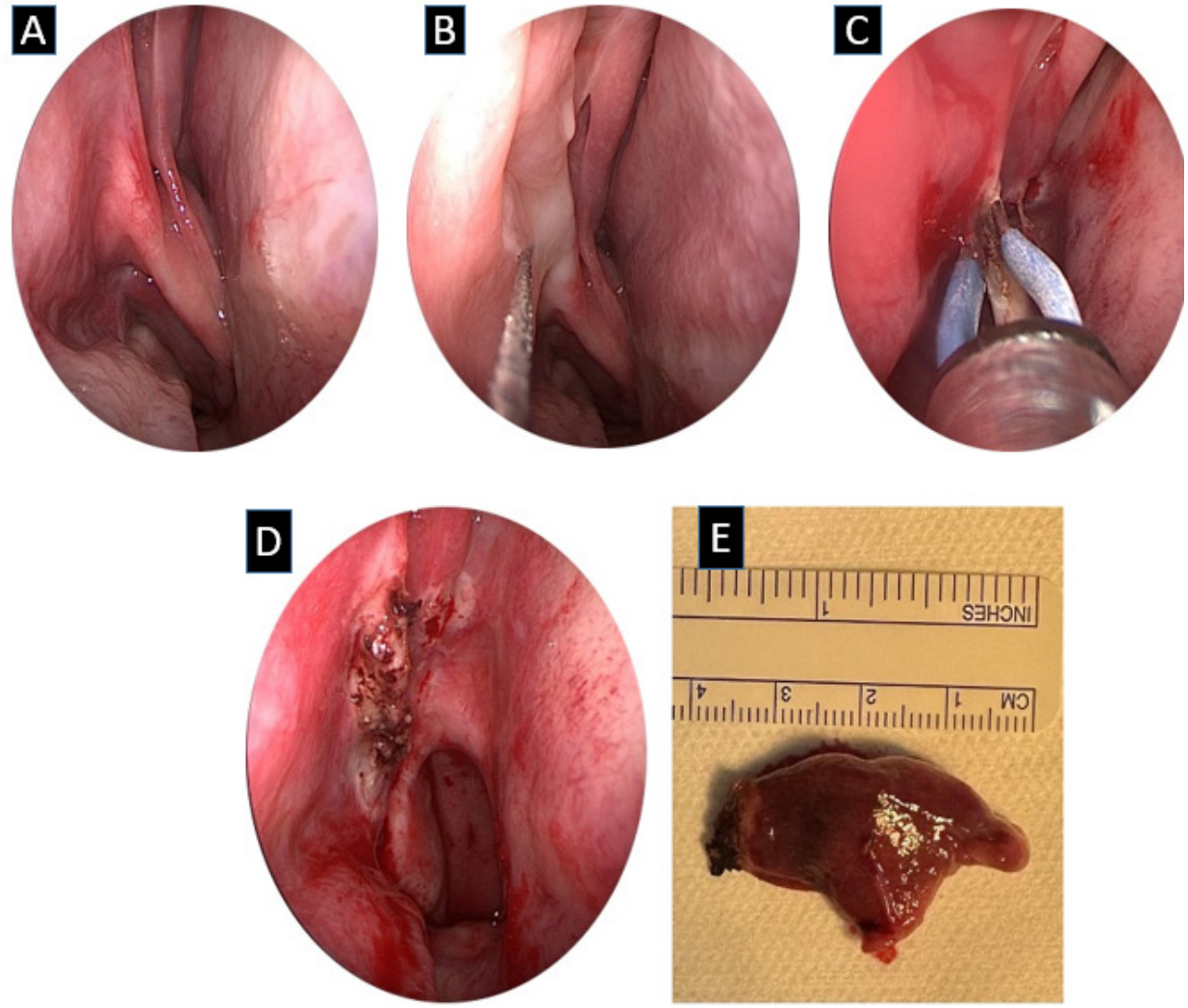

Figure 3: Endoscopic views of the vocal cords and surrounding structures. (A) Initial assessment of the vocal folds. (B) Closer examination of the laryngeal area. (C) Instrumentation for possible intervention. (D) Post-intervention view showing the affected area

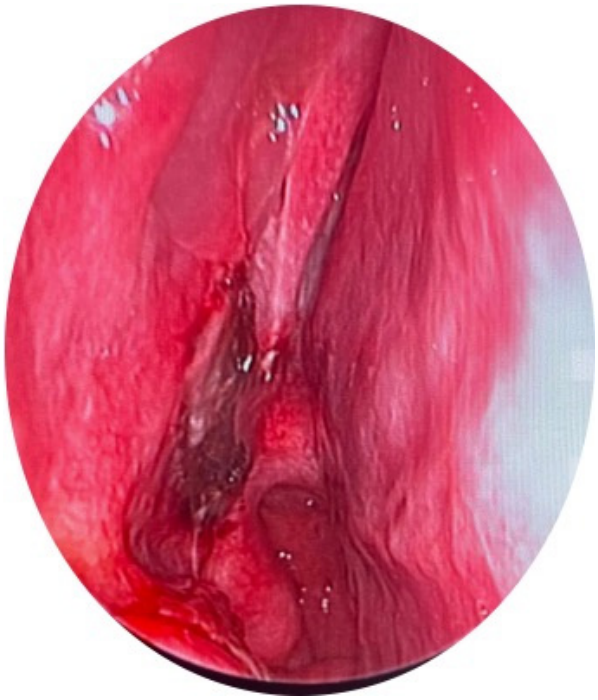

Figure 4: Close-up view of the laryngeal region obtained via endoscopy, highlighting the vascularized tissue and potential pathological changes in the vocal folds (1-week post-surgery).

3. Discussion

Iatrogenic middle turbinate displacement is an extremely rare complication of nasotracheal intubation, with most reports describing only minor nasal injuries such as epistaxis or mucosal trauma. This case describes a 37-year-old male who developed chronic unilateral nasal obstruction and intermittent epistaxis three years after undergoing a dental procedure that required nasotracheal intubation. On imaging, the displaced turbinate mimicked a nasopharyngeal mass, creating a diagnostic challenge that could easily have been misinterpreted as neoplastic or inflammatory disease. A definitive diagnosis was reached through careful correlation of endoscopic and radiological findings, and surgical resection provided complete symptom relief.

The comparative study by Anchan et al. assessed 60 patients with chronic rhinosinusitis who underwent endoscopic sinus surgery, randomized into three groups to evaluate middle turbinate medialization methods. Both Bolgerization and conchopexy achieved high rates of stabilization (90–95%) and significantly improved postoperative outcomes compared with no intervention (Anchan et al., 2022). This case similarly highlights the importance of middle turbinate integrity, as iatrogenic dislocation following nasotracheal intubation caused persistent obstruction resembling a mass lesion. While their findings support proactive medialization in elective surgeries, this report reinforces the need to preserve turbinate stability to avoid rare but serious iatrogenic complications.

In a related trial, Baban et al. studied 80 patients with chronic rhinosinusitis undergoing FESS, randomized into two groups to compare middle turbinate–septal adhesion versus trans-septal suture techniques for preventing lateralization. Both groups showed significant postoperative improvement in endoscopic, radiological, and symptomatic outcomes, with no statistically significant difference between methods (Baban et al., 2023). This case supports their emphasis on turbinate stability, as iatrogenic dislocation after nasotracheal intubation led to persistent obstruction mimicking a mass lesion. While their study focused on preventive stabilization during elective surgery, the findings demonstrated the consequences of turbinate destabilization in iatrogenic trauma.

Said and Sherwani (2020) conducted a prospective study on 90 patients with unilateral sinonasal disease, using clinical evaluation, endoscopy, CT imaging, and histopathological

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confirmation. Chronic rhinosinusitis (52.2%) was most common, followed by antrochoanal polyps, benign tumors, fungal sinusitis, and malignancies (Said & Sherwani, 2020). This case reinforces their conclusion regarding the critical role of turbinate stability, as iatrogenic dislocation after intubation produced obstruction mimicking a mass lesion. While their focus was on common sinonasal disease, this report stresses the impact of turbinate destabilization in iatrogenic injury.

A survey by Ziegler et al. (2023) analyzed 252 responses from the American Rhinologic Society regarding middle turbinate resection practices during endoscopic sinus surgery. Nearly all respondents (97.6%) performed resection selectively, especially in revision cases, citing improved visualization and medication delivery as advantages, though concerns such as iatrogenic frontal sinus obstruction were noted (Ziegler et al., 2023). This case likewise demonstrated the role of MT resection, as surgical removal of an iatrogenically dislocated turbinate completely resolved obstruction, supporting their conclusion that MT resection, when appropriately indicated, offers substantial symptomatic relief.

Gold et al. (2015) described a case of iatrogenic middle turbinectomy after nasotracheal intubation, where CT and endoscopy revealed turbinate displacement into the nasopharynx resembling a foreign body, though the patient declined surgical excision. Their report highlighted that such rare complications may first present as obstruction or epistaxis and are best confirmed radiologically (Gold et al., 2016). This case mirrors their findings in terms of presentation but differs in management; unlike their conservative approach, endoscopic resection in this patient achieved complete resolution. The two reports together illustrate the diagnostic challenge posed by the condition, which is rare, and the key role for imaging in distinguishing it from real mass lesions.

Khalil et al. (2007) reported turbinate dislocation a decade after middle turbinal surgery, with a living turbinate displaced inside the nasopharynx being shown on CT and endoscopy. The surgical resection alleviated the airway obstruction in the patient. Imaging and histology were emphasized for diagnosis in their case (Khalil et al., 2007). This case, similarly, was reliant on detailed radiological and endoscopic evaluation to make a diagnosis of posterior middle turbinate dislocation, though this patient's cause was traumatic intubation and not earlier surgery. This and Khalil's case demonstrate that displaced turbinates radiologically and clinically appear as mass lesions and surgical resection is a trustworthy means of re-establishing function.

Dayal et al. simulated the effect on nasal airflow with computational fluid dynamics (CFD) after total middle versus inferior turbinectomy. Decreased resistance and increased flow was observed in both, but impaired heating and humidification and increased dysfunction was caused by inferior turbinectomy (Dayal et al., 2016). This case likewise demonstrates functional effect of turbinate disruption, iatrogenically caused and not intentionally resected. While their research recommends avoidance of radical resections for the sake of long-term physiologic compromise, this report confirms that judicious selection of resection in this case of a displaced turbinate normalizes airflow and completely eliminates symptoms without undesirable sequelae.

4. Conclusion

Middle turbinate dislocation following nasotracheal intubation is a very uncommon complication that has the potential to closely resemble sinonasal tumors or inflammatory processes, thus posing a risk for misdiagnosis. This case is a reminder of the necessity of keeping high clinical suspicion when assessing chronic unilateral nasal obstruction, especially in those with a history of intubation. Diagnosis relies on combining history, endoscopic assessment, and radiologic imaging. Definitive surgical resection is associated with complete symptom resolution. Increased knowledge of this unusual entity will allow clinicians to escape misdiagnosis, delays, or inappropriately planned interventions.

5. Limitations and Future Implications

The most important limitation of this report is its single-patient design and hence loss of generalizability. The unusual nature of iatrogenic turbinate dislocation also discourages comparisons to larger series, and the long-term results after early follow-up could not be assessed. Multicenter data and case series should be the focus of future studies to more clearly establish the incidence, diagnostic difficulties, and results of this unusual complication. Standardized diagnostic protocols and preventive methods in nasotracheal intubation may decrease risk. Long-term follow-up reports are necessary

to determine functional outcomes and direct the best management strategies.

Statements and Declarations

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Conflicts of interest/Competing interests: The authors declare that there is no conflict of interest to disclose.

Ethical Consideration: Written informed consent to participate in this study was provided by the participant and for the publication of any potentially identifiable images included in this article.

Data Availability: The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available for containing information that could compromise the privacy of research participants.

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