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Secondary Middle Turbinate: An Anatomic Variation

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A 30-year-old man underwent endoscopic sinus surgery for chronic rhinosinusitis with nasal polyposis. He initially presented with a five-year history of gradually worsening nasal congestion, more pronounced on the left side. During surgery, after debulking the severe polyposis on the left, a junior otolaryngology surgeon felt confident upon identifying what appeared to be the middle turbinate, a key surgical landmark. However, on closer inspection, confusion arose when an additional structure resembling the middle turbinate was noted immediately lateral and inferior to it. *(Figure 1)* Upon review of the patient's Computed Tomography (CT) scan images *(Figure 2),* the surgeon was able to identify the primary middle turbinate by viewing the axial cuts and locating the basal lamella.

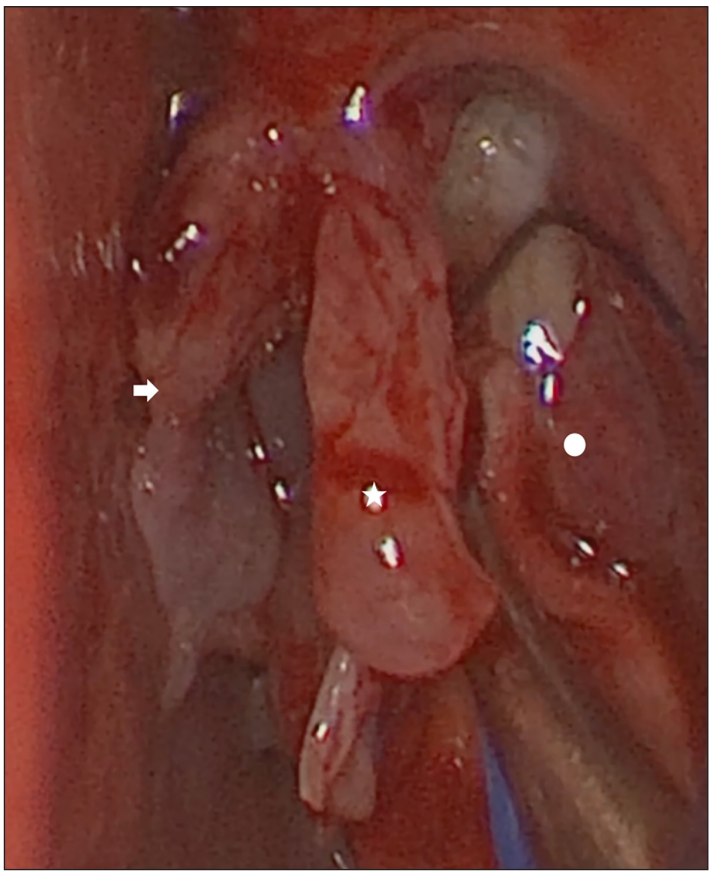

Figure 1. Intraoperative endoscopic view of the left primary middle turbinate (white arrow), secondary middle turbinate (white star) and middle meatus (white circle)

Keywords: *nasal turbinates; anatomic variation; paranasal sinuses; computed tomography; endoscopic surgery*

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The middle turbinate develops from the second ethmoturbinal of the lateral nasal wall. Variations of the middle turbinate may occur as a result of the complex and rapid development of the lateral nasal wall. *Concha bullosa* is the most common anatomical variant followed by a paradoxical middle turbinate. A secondary middle turbinate (SMT), first described by Khanobthamchai *et al.* in 1991, is defined as a bony projection covered by soft tissue that typically arises from the lateral nasal wall. *(Figure 2)*[1] A SMT is a rare anatomical variant, with a reported incidence ranging from 0.8% to 6.8%.[1-3] Although SMT does not usually cause sinusitis, as it typically does not obstruct the osteomeatal complex, it may significantly narrow the middle meatus and pose a challenge during endoscopic sinus surgery.[2]

Successful endoscopic sinus surgery relies heavily on accurate identification of anatomical landmarks. A thorough understanding of sinonasal anatomy and its variations is essential for safe surgical practice and for minimizing complications. Given the unpredictable development of the paranasal sinuses, careful pre-operative evaluation of CT scans is critical. As the middle turbinate serves as a primary surgical landmark, surgeons must be familiar with its anatomical variants to ensure safe and effective surgery.

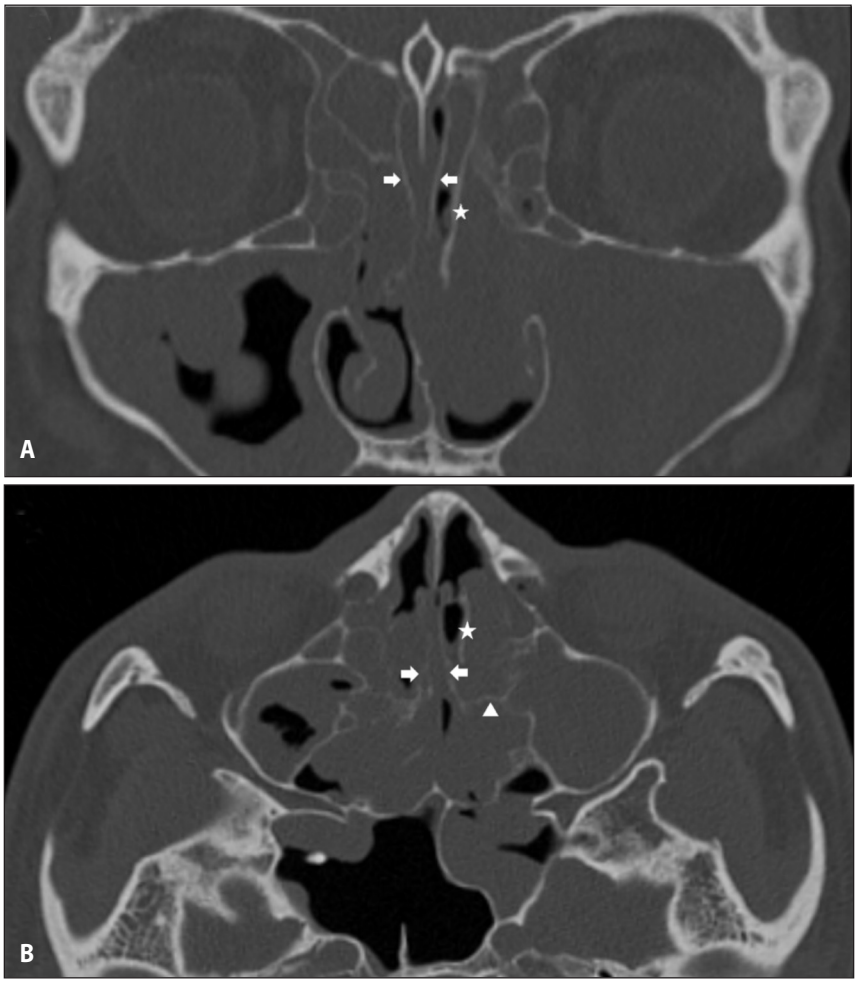

Figure 2. Paranasal sinus CT scans (bone window) at the level of the middle turbinate: **A.** Coronal section demonstrating the right and left primary middle turbinates (white arrows) and a secondary middle turbinate on the left (white star); and **B.** Axial section again demonstrating the primary middle turbinates (white arrows) and the secondary middle turbinate on the left (white star). The primary middle turbinate on the left can be distinguished from the secondary middle turbinate by identifying the basal lamella (white triangle).

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