

A CASE SERIES OF ANATOMIC VARIATIONS OF LATERAL WALL OF NOSE

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ABSTRACT

Lateral wall of nose in the human body is liable to remarkable intersubject and intrasubject variations. The nasal turbinates represents as a crucial anatomical structure, in endoscopic sinus surgery due to the structural superimposition, hence a detailed information on the paranasal sinuses is usually masked. We have observed four different variations of specimens of lateral wall of nose which was rarely reported in the literature. The report of these will definitely help to understand the variant anatomy, and act as a guide in nasal surgeries.

KEYWORDS :**INTRODUCTION:**

The nasal turbinates are the bony projections from the lateral wall of nose. They include the inferior turbinates with an independent bony skeleton, and middle turbinates, superior turbinates occasionally the supreme turbinates, whose bony structures are part of the ethmoid bone. These turbinates have spaces beneath called as meatuses, which provides drainage to the paranasal sinuses located in and around. Inferior meatus drains the nasolacrimal duct. Middle meatus drains a frontal sinus, maxillary sinus, anterior and middle ethmoidal sinuses. There was no report of any accessory opening onto the bony turbinate itself making a way other than the meatuses for the drainage of sinuses.

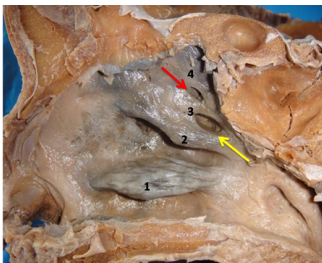
Case Report :

During routine dissection of head and neck for first year medical students, in the Department of Anatomy at Sri Lakshmi Narayana Institute of Medical sciences, Puducherry. A variety of rare variations were observed in the specimens of lateral wall of nose (right and left sides), in four different male cadavers. The following variations were observed.

Specimen A:

In this specimen of lateral wall of nose right side, all the turbinates and their meatuses were identified. The inferior turbinate projected as an independent bone.

Middle, superior and supreme turbinates were identified as bony projections from the ethmoidal labyrinth. But these three upper turbinates were fused with each other giving an appearance of single projection from the ethmoid bone. It was also noted that the superior meatus were reduced into an oval opening (1.5cm) due to the bony fusion and the supreme meatus opening was also an opening of around (1cm).

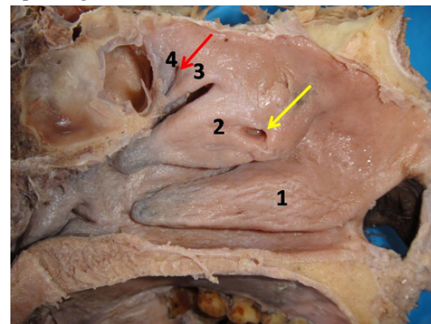


Specimen A – 1. Inferior Turbinate, 2. Middle Turbinate, 3. Superior Turbinate, 4. Supreme Turbinate, Arrow (Yellow) – Superior Meatus, Arrow (Red) – Supreme Meatus

Specimen B:

In this specimen the following findings were noted in a male cadaver on right lateral wall of nose. All the inferior turbinates were identified. An opening of (0.5cm) were present at the

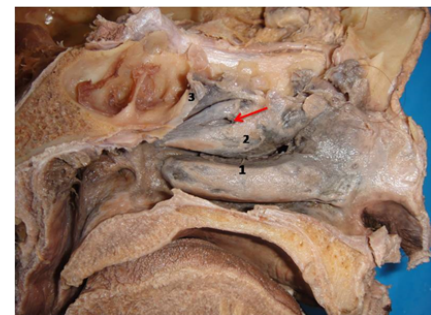
junction of anterior one-third and posterior two-third of the middle turbinate. The superior and the supreme concha were almost fused giving a cleft-like (1.2cm) space for the supreme meatus opening.



Specimen B – 1. inferior turbinate, 2. middle turbinate, 3. superior turbinate, 4. Supreme turbinate, arrow (yellow) – opening over middle turbinate, arrow (red) – cleft like supreme meatus

Specimen C:

In this specimen of lateral wall of nose on left side of a male cadaver, all the turbinates were identified. Over the middle portion middle turbinate more towards the superior border, an opening of (1cm) was found, providing the space for the corresponding sinus to drain.

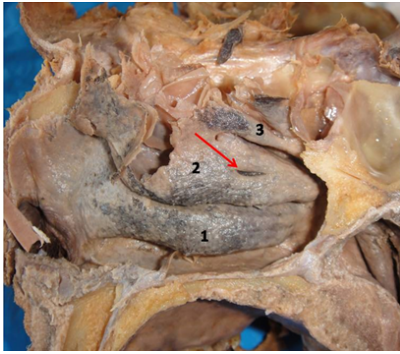


Specimen C – 1. inferior turbinate, 2. middle turbinate, 3. superior turbinate, arrow (red) – ostium over the middle turbinate

Specimen D:

In this specimen of the lateral wall of nose on right side all the turbinates were identified. All the other turbinates except the middle turbinate were normal. There were two openings on the middle turbinate, a cleft like opening at the junction of anterior two-third and posterior one-third there over the middle turbinate. A small circular opening at the junction of anterior and posterior part and on the upper margin of the

turbinate. The middle ethmoidal sinuses drains into that . All the other sinuses are found to drain normally.



Specimen D- 1.Inferior Turbinate, 2.Middle turbinate - Arrow (Red)-Cleft-Like Ostium , (black)Circular ostium near the upper margin, 3.Superior Turbinate

DISCUSSION:

Middle turbinate is the most important surgical landmark of the nose. It is more properly called, the inferior ethmoidal turbinate. It must be considered in every operation that is performed through the nose, as it related with these sinuses or blocks the way to them (9). Several studies in patients with clinical suspicion of recurrent, acute or chronic sinusitis correlating the anatomical variations in the region of middle meatus are found in literature (1-7). In an endoscopic study done by Bist SS(8), middle turbinate was morphologically defined as typical, bilobed ,paradoxical and L- shaped middle turbinate. Santorinus (10) in 1739 described Bullous middle turbinate (BMT) as a mutation of the anterior part of the middle turbinate into a bubble; it is believed to as a variation of ethmoid air cell development, and not as a pathological intranasal process. Chaiyasate et al (11) studied anatomical variations in the paranasal sinuses of twins to find out if these variations are the result of genetic or environmental influences. The study concluded that paranasal sinus pneumatization, were possibly influenced by genetic factors. Marco (12) reported an absence of middle turbinate which existed only as a rudimentary component connecting superior and inferior turbinates . Lang (1989) described a rudimentary middle nasal concha [13]. Gumusalan (1997) showed a case of hypoplasia of both middle and inferior turbinate on one side, and hypoplasia of the middle turbinate and aplasia of the inferior turbinate on the other side [14]. Muniraju et al reported almost 99% of overall prevalence of anatomical variations of lateral wall of nose and paranasal sinuses (15).

The detailed position of these apertures and the precise form and size of each of these varies enormously, the ethmoidal pneumatization may extend upto the middle concha. Supreme nasal meatus may contain an opening for the posterior ethmoidal sinus. Orifices of bullar sinuses opening onto the bulla ethmoidalis (16).

In our observation we found that in all the specimens the inferior turbinates were normally developed .The fusion of middle, superior and supreme turbinates in specimen A could be due to deviation from the normal development influenced by genetic and external factors. In specimens C and D the middle turbinate consisted of an accessory opening which contributed to the drainage of corresponding sinuses .

Embryology:

Embryogenesis of the last three turbinates is a process induced by active intramural pneumatization of the lateral nasal wall during fetal life. Middle turbinate constitutes the superior and medial limits of middle nasal meatus, an air space in which maxillary sinus, anterior ethmoid cells, and

frontal sinus drain mucus trough mucociliary clearance system. All of the turbinates and the paranasal sinuses arise from the cartilaginous nasal capsule. Several soft-tissue folds appear on the lateral wall of each nasal cavity, the preturbinals, which are first supported by cartilage and then by bone. The outpouchings of the nasal mucous membranes that will become the paranasal sinuses are thought to be a secondary phenomenon rather than a primary force in sinonasal development(17).

CONCLUSION:

The pre-requisite to the safe and effective surgical treatment of sinonasal disease is the familiarity of sinonasal anatomy. This variant could be useful to improve the comprehension of sinus outflow tract anatomy. The knowledge of this variation will guide the endoscopic sinus surgeons to carry out the surgery effectively.

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