



Radiological Variations of Uncinate Process in Cases of Sinusitis in a Tertiary Care Hospital in South India - Case Series

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Abstract

Uncinate process is a key structure in the Osteomeatal complex, playing a role in the mucociliary activity. It is a thin sickle shaped projection on the lateral wall of the nose. Its anatomical variations have a major role in the pathogenesis of Chronic Rhinosinusitis.

In this study, our aim is to determine the prevalence of variations in the Uncinate process, radiologically, among the patients attending ENT OPD in a tertiary care hospital in South India.

This is a prospective study, conducted over a period of 2 years from August 2015 to July 2017, in a tertiary care hospital in Visakhapatnam. Patients, who were willing for the study on them, were selected. Complete history was taken and thorough clinical examination was done, along with relevant investigations to find out the prevalence of anatomical variations of uncinat process.

A study was done, consisting of 100 sinusitis patients attending the outpatient department (constituting 200 uncinat processes). CT scan images of 0.625 mm collimation were taken and the images were analyzed with Radiant DICOM viewer.

The most important variation seen in uncinat process is its superior attachment.

Lateral insertion of the uncinat is the commonest. Insertion into skull base is not uncommon.

Anatomical variations of uncinat do not always predispose to rhinosinusitis and thus, indiscriminate uncinectomy is to be condemned. Intrinsic mucosal disease is probably of much more importance than bony anatomy.

Keywords: *Uncinate, Uncinectomy, Osteomeatal Complex.*

Introduction

Uncinate process is a key structure in the osteomeatal complex, playing a role in

mucociliary activity. Its anatomical variations have a role in the pathogenesis of chronic rhinosinusitis.

- It is a thin sickle shaped projection on the lateral wall of nose. Its uppermost segment is not easily visible behind the insertion of middle turbinate.
- Uncinectomy is the first step of Functional endoscopic sinus surgery, which is the treatment of choice for chronic rhinosinusitis, not responding to maximal medical therapy.
- A poorly performed uncinectomy can result in failure of the entire procedure and may lead to orbital and lacrimal complications.
- Superior attachment of uncinete process and the aggenasi cell are important to access the frontal recess.
- Hence this study was conducted to observe the anatomical variations of uncinete process.

The anatomic variations of uncinete process were categorized as

1. Variations in the superior attachment.
2. Medially bent uncinete process.
3. Laterally bent uncinete process.
4. Pneumatized uncinete process or uncinete bulla.

Variations in Superior attachment

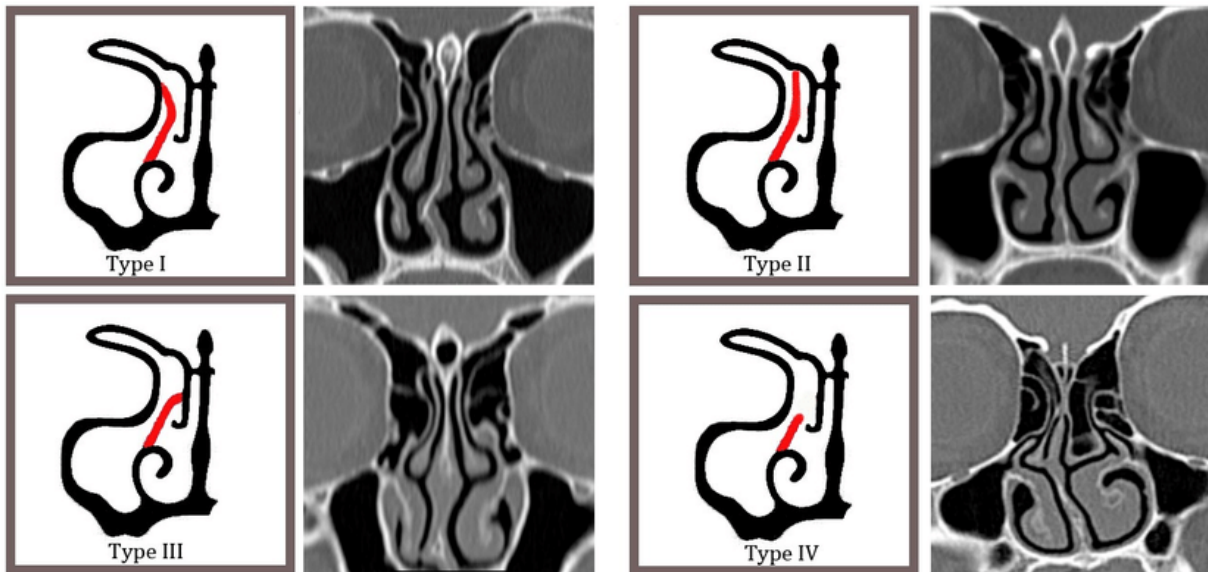
1) In 1991, Stammberger and Hawke first classified the superior attachment of uncinete process into 3 patterns, i.e. to lamina papyracea, skull base and middle turbinate.

Type 1: Insertion into lamina papyracea

Type 2: Insertion into skull base

Type 3: Insertion into middle turbinate

Type 4: Lying free in middle meatus.



2) In 2001, Landsberg and Friedman described 3 more variants and classified into six patterns.

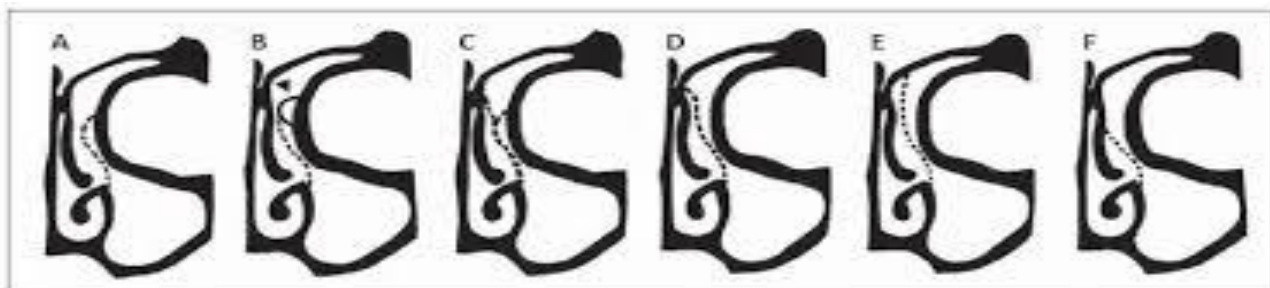


Figure 5. Landsberg & Friedman classification of superior uncinete process insertion. A: Type 1 (insertion into the lamina papyracea). B: Type 2 (insertion into the posterior wall of agger nasi cell). C: Type 3 (insertion into the lamina papyracea and junction of the middle turbinate with the cribriform plate). D: Type 4 (insertion into junction of the middle turbinate with the cribriform plate). E: Type 5 (insertion into the skull base). F: Type 6 (insertion into the middle turbinate).

Our study is based on Stumberger and Hawke study

Frontal sinus outflow tract can be classified into 2 types

- In case of Type 1 attachment of the uncinata, the frontal outflow is directly into the middle meatus. The ethmoidal infundibulum terminates superiorly as a blind pouch called Recessus terminalis.
- In Type II and III, the outflow tract is lateral to uncinata process and frontal recess drains via ethmoidal infundibulum into middle meatus.

Aim

To determine the prevalence of variations in the uncinata process radiologically in the patients attending ENT outpatient department.

Materials and Methods

A prospective study was done, consisting of 100 sinusitis patients attending the outpatient department (constituting 200 uncinata processes). CT scan images of 0.625 mm collimation were taken and the images were analyzed with Radiant DICOM viewer.

Patients who underwent previous endoscopic sinus surgery and those with tumors of the nose were excluded.

Observations

Out of 200 uncinata processes studied, the most common variant was attachment to the lamina papyracea, i.e. Type I (69.5%).

Second most common pattern was type II, observed in 13.0%.

Type III and Type IV was seen 6.5% and 3.5% respectively.

Attachment type	Left	Right	Bilateral	Percentage
Type1	2	1	68	69.5%
Type2	-	2	12	13.0%
Type3	-	1	6	6.5%
Type4	1	-	3	3.5%

Year	Author	Type1	Type2	Type3	Type4
2001	Landsberg et al	60.5%	3.6%	1.4%	-
2013	Tuli et al	79.8%	16.67%	3.57%	-
2015	Kumar et al	55%	8%	20%	11%
2017	Present study	69.5%	13%	6.5%	3.5%

Superior attachment of uncinata couldnot be identified in 15 cases- 7.5%

Turgut et al 26 %

Krzeski et al 34.71 %

Present study 7.5 %

Discussion

Sinusitis is a very common health care challenge in the developed and developing world. The obstruction of osteomeatal complex is regarded the most important in the pathophysiology of rhinosinusitis .Uncinata process being one of the first structures encountered intra operatively, is now given immense surgical importance.

In 2001 Landsberg et all have found the type 1 variety of uncinata process in 60.5% and type 2 in 3.6% of the cases and type 3 in 1.4% and type 4 he has found nil

In 2013 Tuli et all found type 1 in 79.8% of the cases type 2 in 16.67% type 3 in 3.57% and type 4 he has found none. but in 2015 kumar et all found 3.5% of type 4 variety and 55% of type 1 13% of type 2 and 6.5% of type 3.

In all the above mentioned studies, commonest variety is type 1 attachment of uncinata process, which is also the commonest variety in our present study.

Superior attachment cannot be identified definitely for 15 cases of the uncinata process (7.5%) in our study.

Landsberg and Friedman could not identify the superior attachment in 40% cases and turgut et all in 26% cases; krrzeski et al in 34.71% cases.

The typical uncinata was seen in 70 % cases, Variations were present in only 30 % cases.

Medially deviated uncinata process- 24 % (n = 48)

Lateral deviation of uncinata process- 2 % (n = 4)

Pneumatized uncinata process - 4 % (n = 8).

Conclusion

- 1) The most important variation seen in uncinata process is its superior attachment.
- 2) Lateral insertion of the uncinata is the commonest. Insertion into skull base is not uncommon.
- 3) Anatomical variations of uncinata do not always predispose to rhinosinusitis and thus, indiscriminate uncinectomy is to be condemned.
- 4) Preoperative evaluation of CT scans is a must to minimise complications during endoscopic sinus surgery.
- 5) Intrinsic mucousal disease is probably of much more importance than bony anatomy.
- 6) Those who lack a good grasp of anatomy are prone to commit serious and sometimes even fatal mistakes.

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