

# Role of CT Imaging to Evaluate Osteomeatal Complex in Inflammatory Lesions of Paranasal Sinus

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**Abstract:** *The osteomeatal complex or unit is the region where the frontal, anterior and middle ethmoid and maxillary sinuses drain. This includes the frontoethmoidal recess, uncinat process, hiatus semilunaris, ethmoid bulla, the maxillary infundibulum and ostium along with the ethmoid infundibulum. It may be normal, blocked or widened in different inflammatory conditions of PNS. CT scanning is of prime importance because it is helpful in evaluation of osteomeatal complex in different inflammatory conditions of PNS. 50 cases of either strong suspicion or diagnosed of inflammatory conditions of PNS were evaluated. A detailed clinical history with clinical examination and follow up of the suspected/ proven cases was done by CT scan. CT imaging was performed using continuous spiral scan of Paranasal Sinuses with I.V. contrast.*

**Keywords:** Osteomeatal complex, inflammatory conditions of PNS, CT scan

## 1. Introduction

Para-nasal sinuses are hollow, air-filled spaces located within the bones of the face and base of the skull surrounding the nasal cavity. There are four pairs of sinuses, each connected to the nasal cavity by small canal. They include the frontal, ethmoidal, maxillary and sphenoid sinuses[1]. They have various functions, including lightening the weight of the head, humidifying and heating inhaled air, increasing the resonance of speech, and serving as a crumple zone to protect vital structures in the event of facial trauma.

Diseases of the paranasal sinuses are very common and are important because of the intimate relationship of the sinuses to the neighbouring structures such as the brain and the orbit. Any condition (inflammation, neoplasm, foreign body) that interferes with drainage of a sinus renders it liable to infection.[2]

The osteomeatal complex or unit is the region where the frontal, anterior and middle ethmoid and maxillary sinuses drain. Osteomeatal complex term is used by the surgeon to indicate the area bounded by the middle turbinate medially, the lamina papyracea laterally, and the basal lamella superiorly and posteriorly. The inferior and anterior borders of the osteomeatal complex are open. Osteomeatal complex is divided into anterior and posterior. The space behind the basal lamella containing the posterior ethmoidal cells is referred to as the posterior osteomeatal complex and drains the posterior third of bilateral ethmoids and the sphenoid sinus. Hence the anterior and the posterior osteomeatal complex have separate drainage systems

## 2. Aims and Objective

To study the appearances of osteomeatal complex in different inflammatory conditions of PNS using CT scan provides excellent bone detail and accurate soft tissue

mapping. It is used routinely before endoscopic surgery to evaluate extent of the inflammatory disease and to assess important anatomic landmarks and their variations.[3].

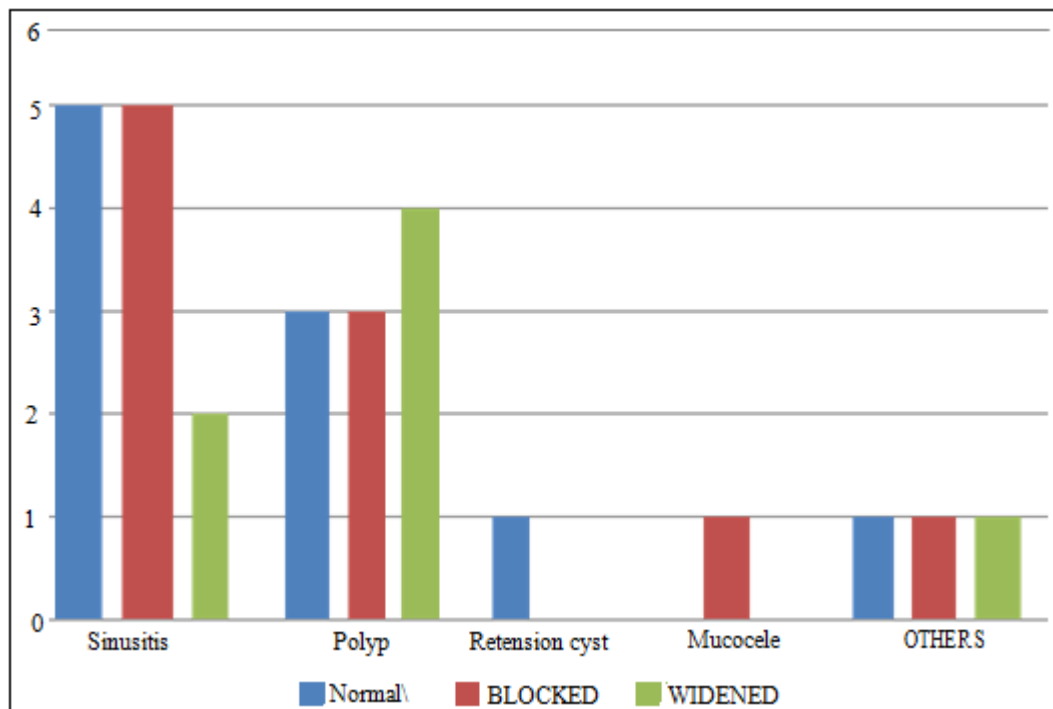
## 3. Methods & Material

50 cases of either strong suspicion or diagnosed of inflammatory conditions of PNS were evaluated. A detailed clinical history with clinical examination and follow up of the suspected/ proven cases was done by CT scan. CT imaging was performed using continuous spiral scan of Paranasal Sinuses with I.V. contrast. CT scan : Emotion semiens 16. Contrast agent used: Urografin

## 4. Results and Discussion

- 50 patients of inflammatory conditions of PNS were evaluated; out of these osteomeatal complex evaluation was done in 27 cases.
- 10 patients had normal osteomeatal complex, despite being affected by inflammatory conditions.
- 10 patients had Blocked OMC, out of these 5 had sinusitis, 3 had polyp, 1 had mucocele, and another 1 had other inflammatory conditions of PNS.
- Widening of osteomeatal complex was seen in 7 cases. Out of these 2 suffered from sinusitis, 4 had polyp and another 1 patient had other inflammatory condition of PNS.

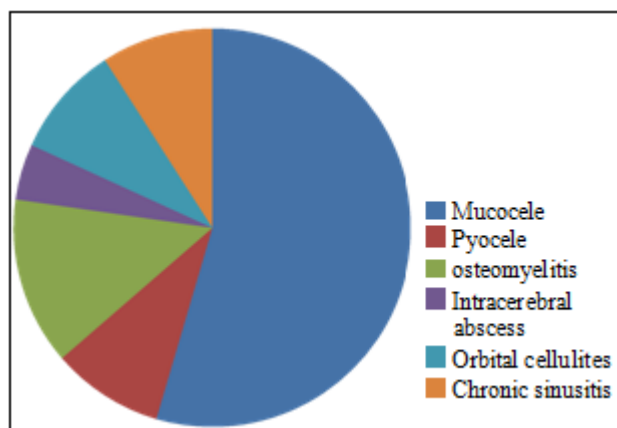
Osteomeatal Complex	Normal	Blocked	Widened
Condition			
Inflammatory			
Sinusitis	05 (50%)	05 (50%)	02 (28%)
Polyp	03 (30%)	03 (30%)	04 (57%)
Retention cyst	01 (10%)	-	-
Mucocele	-	01 (10%)	-
Others	01 (10%)	01 (10%)	01 (15%)
Total	10	10	7



- This helps the surgeon to decide the line of management, since a surgical approach is required if there is blockage of osteomeatal complex.
- In the rest 23 cases, osteomeatal complex was not evaluated and the patients were treated. Of these, 11 patients suffered from complications like mucocele(12), pyocele(2), osteomyelitis(3), intracerebral abscess(1) and orbital cellulites (2) and chronic sinusitis(2). Retrospective studies of these patient shows that there was blockage of osteomeatal complex on initial studies.

sinuses as compared to plain radiographs. Differentiation of malignant lesions and granulomatous lesions with bone erosion can be made on CT scan with enhancement pattern, extension pattern and multiplicity of sinus involved, however histopathological diagnosis is needed in severe cases. Thus, CT scan of paranasal sinuses with axial and coronal reconstruction is the investigation of choice for characterisation, location, extent and diagnosis of paranasal pathologies, providing roadmap for surgery and planning of surgery.

### 5. Complication



### References

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### 6. Conclusion

CT scan is the most reliable imaging technique for determining if the sinuses are obstructed and best imaging modalities for sinusitis. Involvement of maxillary and ethmoid sinus is most common in patients of sinusitis who are treated either conservatively or operatively. Presence of erosion of bones and intraorbital, infratemporal fossa and surrounding sinus extension is effectively demonstrated on axial and coronal reconstruction CT scan of paranasal