

## Introduction

The interest in detailed anatomy of the sellar and parasellar region has resurged recently due to the wide clinical applications of the expanded endoscopic approaches to the skull base. The middle clinoid process (MCP) is a bony structure that can affect wide endoscopic exposure of the sellar and parasellar region. The purpose of this project is to study and analyze the anatomical variations of the MCP in the general population using CT scans.

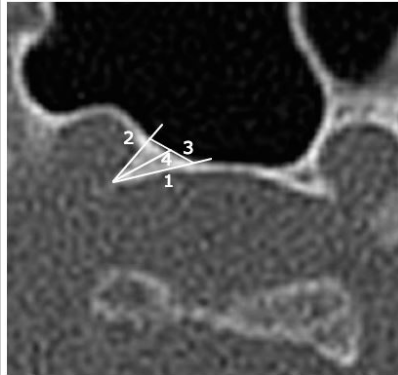
## Methods

150 maxillofacial CT scans were reviewed to characterize the MCP. Only adult patients with no pathology in sellar region that could potentially cause changes in the morphology of the MCP. Measurements were made in the axial and sagittal planes to determine maximum length, diameter, distances from key structures and angulation of the MCP. Charts were reviewed for demographic data including age, sex, race, and ethnicity.

## Learning Objectives

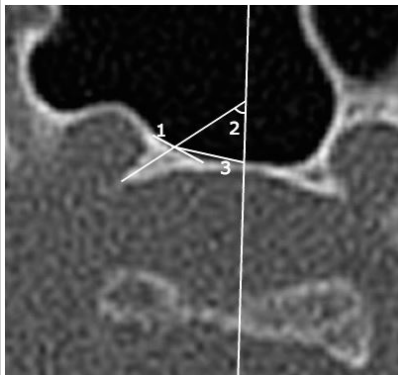
By conclusion of this session, participants should be able to: 1) Identify the middle clinoid process on CT scans, 2) Understand the basic morphology and variants of the middle clinoid process, 3) Understand how the presence and morphology of the middle clinoid process can impact the transphenoidal surgical approach.

### Axial Length and Width



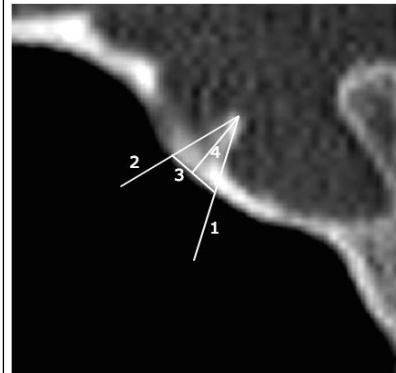
Demonstration of methods for axial length and width measurement in the axial view

### Axial Angle and Midline distance



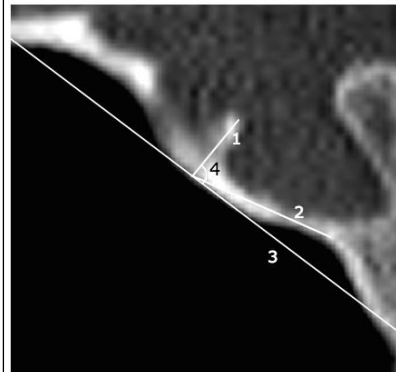
Demonstration of angle and midline distance measurements in the axial view

### Sagittal Length and Base Width



Demonstration of length and base width measurements in the sagittal view.

### Sagittal Angle and SCJ measurement



Demonstration of angle and SCJ measurement in the sagittal view. SCJ - Sella Clival Junction.

## Results

The prevalence of the MCP was 30.7% in males and 42.7% in females. Of subjects found to have an MCP, 41.8% were ring forming while 76.4% were pneumatized. Quantitatively the average base diameter was  $4.6 \pm 1.4$  mm in the axial plane and  $5.0 \pm 1.8$  mm in the sagittal plane, average maximum length was  $4.7 \pm 1.7$  mm, average distance from midline was  $5.9 \pm 2.3$  mm, average distance from the clival sellar angle was  $10.6 \pm 3.3$  mm, average angle in the sagittal plane was  $91.0 \pm 15.4^\circ$ , and average angle in the axial plane was  $45.2 \pm 15.5^\circ$ . There were no significant differences in gender, age, ethnicity, or laterality. There was a significant increase in the prevalence of MCPs in whites as compared to African Americans or blacks (41.3% vs 19.4%,  $p = .02$ ). Additionally, when comparing males to females, males showed significantly larger midline distance ( $7.0 \pm 2.2$  mm vs  $5.2 \pm 2.1$  mm,  $p = .0001$ ) and sagittal angle ( $50.4 \pm 15.6^\circ$  vs  $41.6 \pm 14.5^\circ$ ,  $p = .01$ ).

## Conclusions

A clear understanding of the sellar and parasellar anatomy is crucial for performing successful and safe expanded endoscopic approaches to treat skull base pathologies. This study provides a quantitative anatomical characterization of the MCP in the general population. Careful review of CT imaging is necessary for safe and effective surgery.

## References

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