



**SEXUAL DIMORPHISM OF MAXILLARY AIR SINUS BY COMPUTED
TOMOGRAPHY IN GWALIOR REGION**

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ABSTRACT

Introduction: Human are slightly sexually dimorphic. It has been reported that the skull, pelvis and long bones can be used for identification of gender. Maxillary sinus can be used for identification. CT scan is useful radiological technique to find out dimensions of maxillary air sinus. The aim of this study is to determine the reliability and accuracy of maxillary air sinus dimensions, i.e. anteroposterior, diameter, width, height in estimating sexual difference. **Material and methods:** The present study was an observational study in which CT images of 100 adult individual in the age group of 18-60 years of age either sex (50 male and 50 female) attending the Department of Radiology of G.R. Medical College, Gwalior (M.P.). We use (128 slice) multi detector spiral CT scanner. Parameter measured on the right and left maxillary sinus are as follows:

- The transverse diameter was measured on coronal reconstructed image from outermost point of lateral wall of maxillary sinus to the medial wall.
- The antero-posterior diameter was measured on sagittal reconstructed image as longest length antero-posteriorly.
- The height was measured on coronal reconstructed image from the uppermost point of superior wall of the sinus to the lowest point on the inferior wall.

Results: The result of present study revealed that a significant sex difference was found in maxillary air sinus with anteroposterior diameter. Left anteroposterior diameter was the best discriminate variable ($p=0.0002$) between gender. **Conclusion:** In this study on comparing the right and left maxillary air sinus statistically non-significant difference were found between male and female for anteroposterior diameter, width and height. On comparing the finding between the male and female statistically significant difference were found in anteroposterior diameter and width of maxillary air sinus.

INTRODUCTION

Skeletal biological apply their knowledge of human skeletal variation to answer questions about skeletal age, sex, ancestry, stature, occupation, medical history, personal habits, health status and cause of death.^[1]

Humans are slightly sexually dimorphic. It has been reported that the skull, pelvis and long bones with epiphysis and metaphysis in the skeleton can be used for identification of gender.

Maxillary sinus remains intact although the skull and other bones may be badly disfigured in victims who are incinerated and therefore maxillary sinus can be used for identification.^[2]

The use of radiological techniques improved and became widespread by the creation of computerized tomography (CT), magnetic resonance imaging (MRI), multislice

computed tomography (MSCT) and ultrasound. CT has also been used in forensic context as an aid in bite mark analysis. Computerized tomography (CT) scan are an excellent imaging modality evaluate the Sino-nasal cavities.^[3-4]

They provide an accurate assessment of the paranasal air sinuses, craniofacial bones, as well as extent of pneumatization.^[5,6]

Aim of this study is to study the morphometry of adult maxillary air sinus, to compare the right and left side of adult maxillary sinus, to study and interpret, the sexual difference in adult maxillary air sinus, study the variation of maxillary air sinus and apply this knowledge clinically, to compare the findings of present study with the findings of previous studies.

MATERIAL AND METHODS

This observational in which CT images of 100 adult individuals in the age group of 18-60 years of age of either sex (50 males and 50 females) attending the department of Radiodiagnosis at Gajra Raja Medical College, Gwalior whom CT scan were normal.

We use 128 slides multi detector spiral CT scanner.

Scanning parameters includes supine position, slice thickness – 1 mm, feed/rotation –13.5 mm.

Parameters measured on right and left maxillary sinus are as follows:

- The transverse diameter was measured on coronal reconstructed image from outermost point of lateral wall of maxillary sinus to the medial wall.
- The antero-posterior diameter was measured on sagittal reconstructed image as longest length antero-posteriorly.
- The height was measured on coronal reconstructed image from the uppermost point of superior wall of the sinus to the lowest point on the inferior wall.

RESULTS

The result of present study revealed that a significant sex difference was found in maxillary air sinus with anteroposterior diameter. Left anteroposterior diameter was the best discriminate variable ($p=0.0002$) between gender.

Table 1: Anteroposterior diameter of maxillary air sinus on right side in females and males.

Right Antero-posterior diameter	Sex		Total
	Female	Male	
2.0-2.9 cm	6	3	9
3.0-3.9 cm	39	38	77
4.0-4.9 cm	5	9	14
Total	50	50	100

Anteroposterior diameter of maxillary sinus on right side, in males was 3.6 cm in the range of 2.7 cm to 4.4 cm and that in females was 3.4 cm in the range of 2.7 cm to 4.4 cm with p value of 0.03.

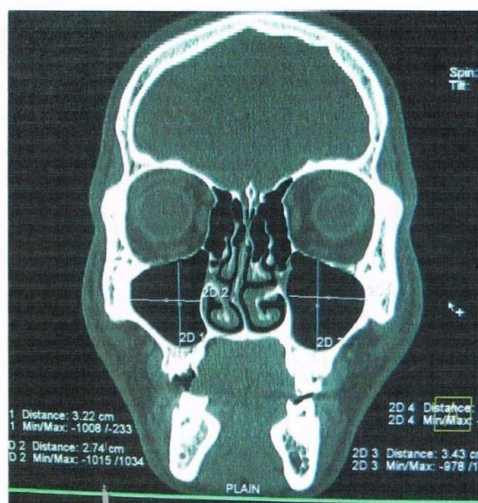
Table 2: Width of maxillary air sinus on right side in females and males.

Right width	Sex		Total
	Female	Male	
1.0-1.9 cm	9	5	14
2.0-2.9 cm	38	42	80
3.0-3.9 cm	3	3	6
Total	50	50	100

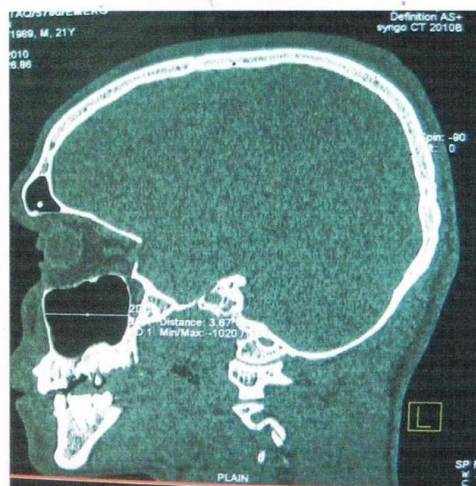
Mean right side width of maxillary sinus, in males was 2.44 cm in the range of 1.4 cm to 3 cm and that in females was 2.25 cm in the range of 1.6 cm to 3.2 cm with p value of 0.0094.

Table 3: Height of maxillary air sinus on right side in females and males.

Right height	Sex		Total
	Female	Male	
1.0-1.9 cm	0	1	1
2.0-2.9 cm	19	15	34
3.0-3.9 cm	30	32	62
4.0-4.9 cm	1	2	3
Total	50	50	100



The width and height of maxillary air sinus measured from reconstructed coronal section of CT scan.



The anteroposterior diameter of maxillary air sinus on reconstructed sagittal section of CTscan

The mean right height of maxillary sinus, in males was 2.98 cm in the range of 1.6 cm to 3.5 cm and that in females was 2.96 cm in the range of 2 cm to 3.9 cm with p value of 0.4414.

DISCUSSION

Anteroposterior diameter of maxillary sinus on right side, in males was 3.6 cm in the range of 2.7 cm to 4.4 cm and that in females was 3.4 cm in the range of 2.7 cm to 4.4 cm with p value of 0.03. In comparison with Asmaa T. Uthman (2011)^[6] who have shown that there exist statistically significant difference right side height of maxillary air sinus in male and females.

Mean right side width of maxillary sinus, in males was 2.44 cm in the range of 1.4 cm to 3 cm and that in females was 2.25 cm in the range of 1.6 cm to 3.2 cm with p value of 0.0094. This was in comparison to study done by Asmaa T Uthman (2011)^[6] found it to be 2.47 cm for male and 2.527 cm for female.

The mean right height of maxillary sinus, in males was 2.98 cm in the range of 1.6 cm to 3.5 cm and that in females was 2.96 cm in the range of 2 cm to 3.9 cm with p value of 0.4414. This was in comparison to the earlier studies, Asmaa T. Uthman (2011)^[6] found to be 3.93 cm for male and 3.69 cm for female.

The mean left anteroposterior length of maxillary sinus, males was 3.61 cm in the range of 3 cm to 4.8 cm and that in females was 3.3 cm in the range of 2.7 cm to 4.1 cm with p value of 0.0002. This was in comparison to the earlier studies, Hacer Yaser Teke (2006)^[2] found it to be 4.7 cm in males and 4.3 cm in female.

CONCLUSION

CT images could provide adequate measurement for maxillary air sinuses. The mean right side

anteroposterior diameter of maxillary sinus in females was 3.639 cm and in males was 3.56 cm with p value < 0.05. The eman left side anteroposterior diameter of maxillary sinus in females was 3.32 cm and in males was 3.61 cm with p value < 0.05. The mean right side width of maxillary sinus in females was 2.25 cm and in males was 2.44 cm with p value < 0.05. The mean left side width of maxillary sinus in females was 2.30 cm and in males was 2.47 cm with p value < 0.05. The mean right side height of maxillary sinus in females was

2.93 cm and in males was 2.98 cm with p value > 0.05. The mean left height of maxillary sinus was 2.91 cm and in males was 2.99 cm with p value > 0.05.

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