

A Study to Evaluate Relationship of Sella Turcica with Different Skeletal Malocclusion on Lateral Cephalometric Radiograph

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Abstract

Context: Sella turcica is structure readily seen on lateral cephalometric radiographs. Morphological correlation between various structures of craniofacial region is important to predict various malocclusions. **Aims:** The aim of the study was to analyze morphology and dimensions of sella turcica with different skeletal patterns among Maharashtrian population. **Materials and Methods:** Lateral cephalograms of 90 patients (42 males and 48 females) aged 12–40 years who reported for treatments of malocclusions were studied. 90 patients divided into three groups such as Class I, Class II, and Class III skeletal malocclusion based on ANB angle. Each group consists of 30 patients. **Statistical Analysis Used:** Lateral cephalograms of 90 patients (42 males and 48 females) aged 12–40 years who reported for treatments of malocclusions were studied. 90 patients divided into three groups such as Class I, Class II, and Class III skeletal malocclusion based on ANB angle. Each group consists of 30 patients. **Results:** Statistically significant difference was observed among overall groups comparison in relation to morphology of sella turcica. However, no correlation was found with different ages, gender, length of sella turcica, and depth of sella turcica. **Conclusions:** The study showed that most common morphology of sella turcica was oblique anterior wall among all the skeletal malocclusions. Morphological correlation of sella turcica was found with different skeletal malocclusion.

Keywords: Sella turcica, Malocclusion, Lateral cephalogram.

INTRODUCTION

The lateral cephalometric radiograph (LCR) is a standardized, reproducible radiographic assessment of the craniofacial structures.^[1] It is one of the essential diagnostic tools used for orthodontic diagnosis and treatment planning.^[2] The identification of various landmarks of the radiograph helps in analyzing the relative position maxilla and mandible in relation to themselves or to the cranium.^[3] Sella turcica is the structure which can be readily seen on LCR.^[4] Sella turcica is a saddle-shaped depression in the body of the sphenoid bone of the human skull which contain the pituitary gland.^[5] It is used as a reference point and routinely traced for various cephalometric analysis.^[6] The morphology of sella turcica is used for evaluating craniofacial morphology, growth changes, frontonasal and maxillary developmental fields, orthodontic treatment results, pathology of pituitary gland and various syndromes that affect the craniofacial region.^[7] Morphological correlation between various structure of craniofacial region is important to predict various malocclusions.

Correlation of sella turcica morphology and sagittal skeletal malocclusion has been reported in various studies in the past.^[8–10] However, ethnic variations are predominant in skeletal anatomy.

No such study was found after an extensive search on Maharashtrian population; hence, this study was undertaken.

The aim of our present study is to to evaluate relationship of Sella Turcica with different skeletal malocclusions on LCR in Maharashtrian population.

MATERIALS AND METHODS

Inclusion criteria

1. The subject should be of age 12–40 years
2. The subject with no previous orthodontic, orthopedic or surgical treatment, no craniofacial trauma, no congenital anomalies and no neurological disturbances.

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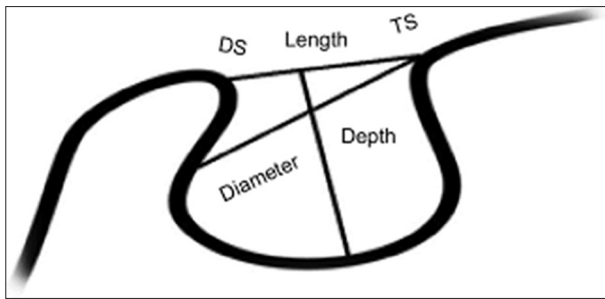


Figure 1: Sella Turcica, DS: Dorsum sella, TS: Tuberculum sella

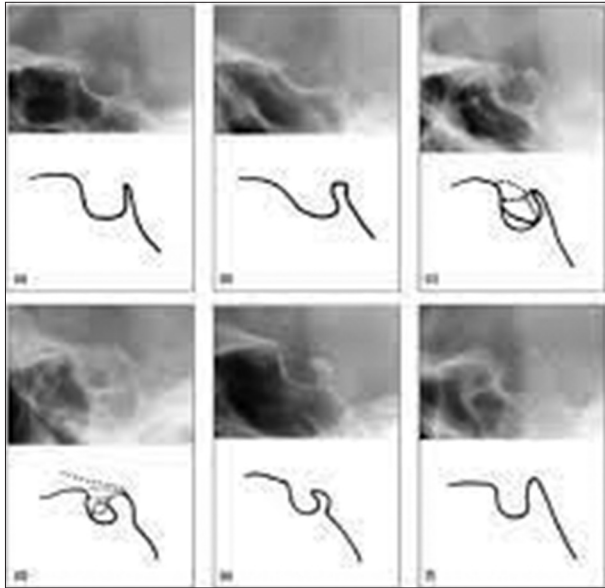


Figure 2: Morphology of sella Turcica

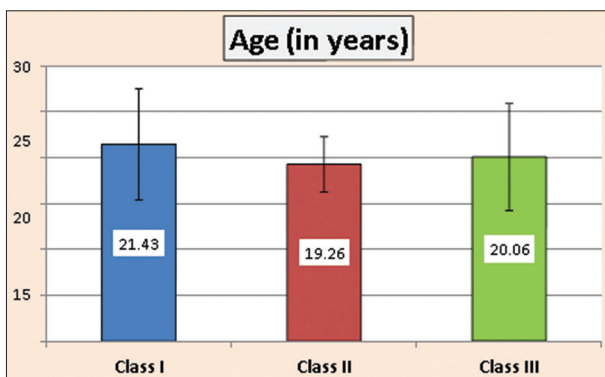


Figure 3: Age

Exclusion criteria

1. The subjects who was not be willing to be a part of study
2. The subjects whose radiographs was not be clear for interpretation
3. The subjects with major illness or medical conditions.

Source of data

The lateral cephalogram of 90 Maharashtrian subjects (42 males and 48 females), aged 12–40 years who reported to

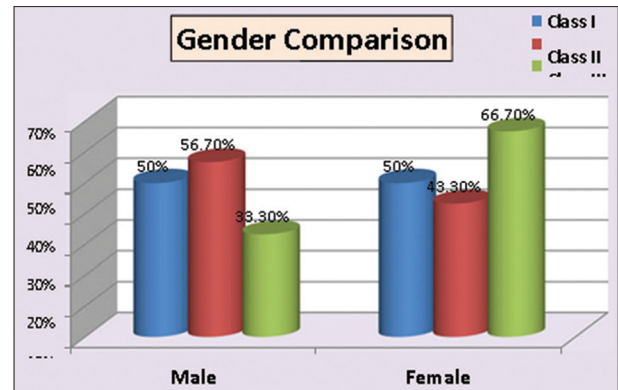


Figure 4: Gender

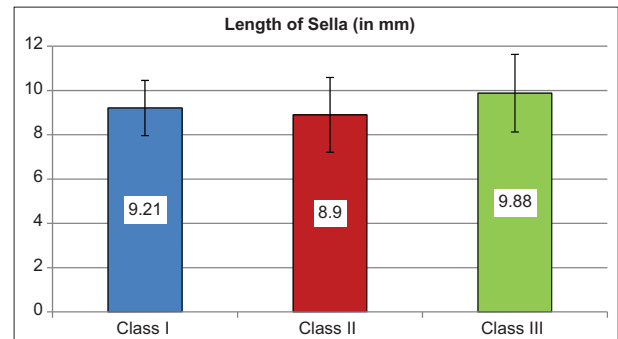


Figure 5: Length of sella

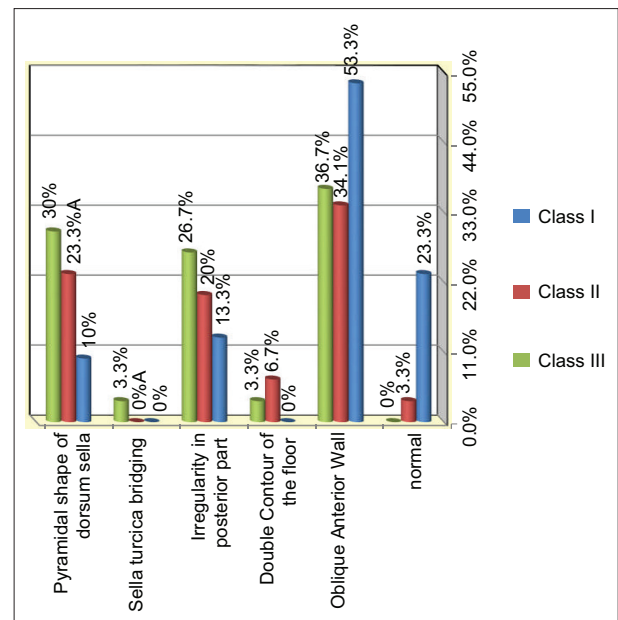


Figure 6: Overall comparison

the Department of Orthodontics and Dentofacial Orthopedics of CSMSS Dental College for various treatments of malocclusions were studied. The subjects with previous orthodontic treatment, medical conditions and those who were not willing to participated were excluded from the study.

Ninety lateral cephalogram collected were divided into three groups such as skeletal Class I, Class II, and Class III based on ANB angle.

Each group will consist of 30 patients.

The sella turcica region was traced on LCR on thin acetate paper under ideal light illumination by the same operator to avoid the inter-operator errors.

For linear measurements

Different parts of the sella turcica were traced including tuberculum sella, floor of sella turcica, dorsum sella, anterior and posterior clinoid process.

Silverman and Kisling method will be used to measure linear distance Figure 1.^[11]

1. Length of sella turcica: Measured from tuberculum sella to tip of the dorsum sella
2. Diameter of sella turcica: Measured by drawing a line from the tuberculum sella to most distant point on the posterior inner wall of the fossa
3. Depth of sella turcica: Calculated by drawing a line perpendicular to the line passing through the deepest point on the floor of sella turcica.

For morphology of sella turcica^[12-16]

The shape of Sella Turcica was categorized into six groups Figure 2:

1. Normal sella turcica
2. Oblique anterior wall
3. Double contour of sella floor
4. Sella turcica bridging
5. Irregularity (notching) in the posterior part of the dorsum sella
6. Pyramidal shape of the dorsum sella.

Statistical analysis

1. Analysis was done by ANOVA F test for comparison of age Figure 3 and gender Figure 4, length of sella Figure 5 turcica and depth of sella turcica
2. Tukey's *Post-hoc* test was used for overall group comparison Figure 6 of length of sella turcica and depth of sella turcica
3. Chi-square test was used for overall comparison in relation to morphology.
 - $P < 0.05$ was considered as significant.

RESULTS

1. Statistically significant difference was observed among overall groups comparison in relation to morphology of sella turcica
2. Statistically insignificant difference was observed among overall groups comparison
3. Statistically insignificant difference was observed in pairwise comparison in different ages, gender, length of sella turcica, and depth of sella turcica.

DISCUSSION

1. The study showed that most common morphology of sella turcica was oblique anterior wall followed by normal sella turcica
2. In Class I cases, most frequently seen was oblique anterior wall followed by normal sella turcica, irregularity in posterior part of the dorsum sella and pyramidal shape of dorsum sella
3. In Class II cases, oblique anterior wall shape was most common followed pyramidal shape of dorsum, irregularity in posterior part of the dorsum sella and double contour of the floor of sella
4. In Class III cases, oblique anterior wall was most common followed pyramidal shape of dorsum, irregularity in posterior part of the dorsum sella, double contour of the floor of sella and sella bridging.

CONCLUSIONS

1. The morphological appearance of Sella turcica is established in early embryonic structure and bridge is evident as early as 6 years of age. The complete malocclusion is established by 18 years of age
2. Our study concluded that there is significant difference observed among different types of malocclusion in relation to morphology of sella turcica
3. Hence, we can predict the malocclusion as early as 6 years of age by studying the morphology of sella turcica on lateral cephalogram.

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