

Original Research

Assessment of size and morphology of sella turcica in different skeletal pattern- A cephalometric study

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ABSTRACT:

Background: Sella turcica is an important landmark and has been routinely used in various cephalometric analyses and for analyzing pathologies of the pituitary gland or several syndromes affecting the craniofacial region. The present study was conducted to assess size and morphology of sella turcica in different skeletal pattern. **Materials & Methods:** The present study was conducted on 75 patients with skeletal malocclusion of age ranged 9-16 years of both genders. In all patients, size and shape of sella turcica was recorded. **Results:** Out of 75 patients, males were 30 and females were 45. Class I skeletal malocclusion, 14 patients had normal, 5 had notching, 4 had pyramidal and 2 had oblique shape, in class II, 9 had normal, 10 had notching, 1 had pyramidal and 5 had oblique shape, in class III, 12 had normal, 8 had notching and 5 had pyramidal shape. The mean length was 9.02 mm in class I, 8.75 mm in class II and 8.72 mm in class III patients. Mean depth was 7.42 mm in class I, 7.20 mm in class II and 7.36 mm in class III patients. Mean AP diameter was 11.18 mm in class I, 11.12 mm in class II and 10.94 mm in class III patients. **Conclusion:** Authors found that most patients had normal shape followed by notching. The size was found to be similar in all types of skeletal malocclusion.

Key words: Sella turcica, notching, Orthodontics

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INTRODUCTION

Cephalometric radiograph tracing involves the use of many landmarks within the cranium, which helps in knowing the relative position of maxilla and mandible to the cranium and to themselves.¹ Analyzing these structures in depth helps in orthodontic diagnosis, measuring the growth through superimposition on a longitudinal basis and to evaluate orthodontic treatment

results.² Among them, Sella turcica (sella point S) is an important landmark and has been routinely used in various cephalometric analyses and for analyzing pathologies of the pituitary gland or several syndromes affecting the craniofacial region.³ With the help of normal radiographic anatomy and morphological variations of this region it would be easy to identify any deviations that may reflect the pathological conditions

which is essential for the orthodontists and other clinicians even before they are clinically apparent.⁴ Sella turcica is a saddle-shaped concavity in the body of sphenoid bone situated in the middle cranial fossa of the skull. Sella turcica gets its name from Turkish language because of its similarity to the Turkish saddle.⁵ The depression in saddle is noted as pituitary fossa or hypophyseal fossa. The pituitary gland is situated in the hypophyseal fossa. It is limited by bony constituents of the sella turcica, anteriorly by tuberculum sellae, posteriorly by dorsum sellae and inferiorly by the bony roof of sphenoid air sinus. Sella turcica on lateral cephalometric radiograph can be observed clearly and consecutively traced during cephalometric analysis.⁶ The present study was conducted to assess size and morphology of sella turcica in different skeletal pattern.

MATERIALS & METHODS

The present study was conducted at Vananchal Dental College and Hospital Garhwa, Jharkhand, India. It comprised of 75 patients with skeletal malocclusion of

age ranged 9-16 years of both genders. The study was approved from institutional ethical committee. All were informed regarding the study and written consent was taken.

Data such as name, age, gender etc. was recorded. All patients were subjected to lateral cephalometric radiographs. Linear measurements of the sella turcica (length, breadth, anteroposterior diameter) were measured on the tracing based on the methodology described by Silverman & Kisling.

All the reference lines were in the mid-sagittal plane, and the measurements were made with digital sliding calipers. The length, depth and antero-posterior diameter of sella turcica was recorded. Shape of the sella turcica as oblique anterior wall, sella turcica bridging, double contour of the floor, irregularity (notching) in the posterior part of the dorsum sella and pyramid shape of dorsal sellae was recorded. Results thus obtained were subjected to statistics. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 75		
Gender	Males	Females
Number	30	45

Table I shows that out of 75 patients, males were 30 and females were 45.

Table II Different shape of sella turcica

Skeletal relation	Normal	Notching	Pyramidal	Oblique	P value
Class I	14	5	4	2	0.02
Class II	9	10	1	5	0.01
Class III	12	8	5	0	0.01

Table II shows that in class I skeletal malocclusion, 14 patients had normal, 5 had notching, 4 had pyramidal and 2 had oblique shape, in class II, 9 had normal, 10 had notching, 1 had pyramidal and 5 had oblique shape, in class III, 12 had normal, 8 had notching and 5 had pyramidal shape. The difference was significant (P< 0.05).

Graph I Different shape of sella turcica

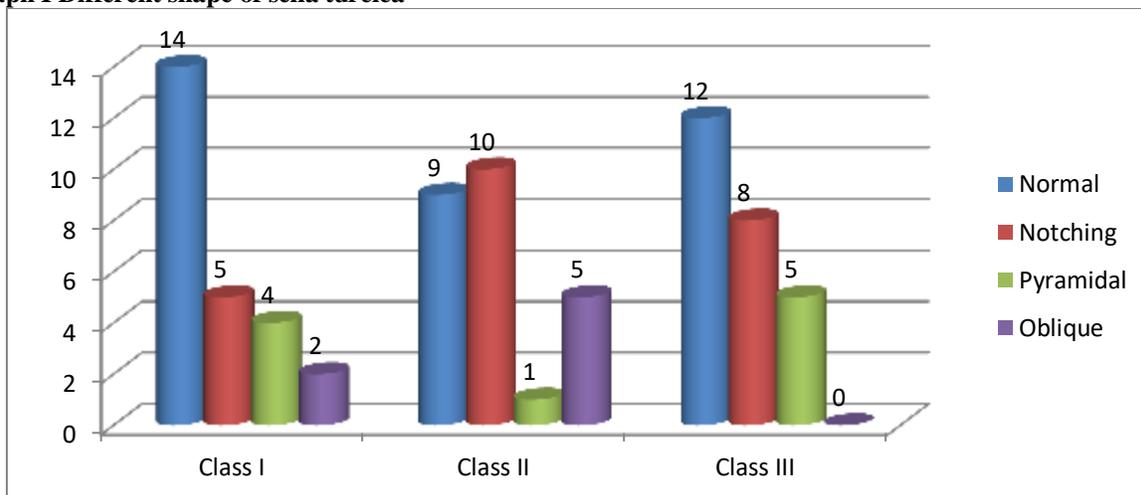
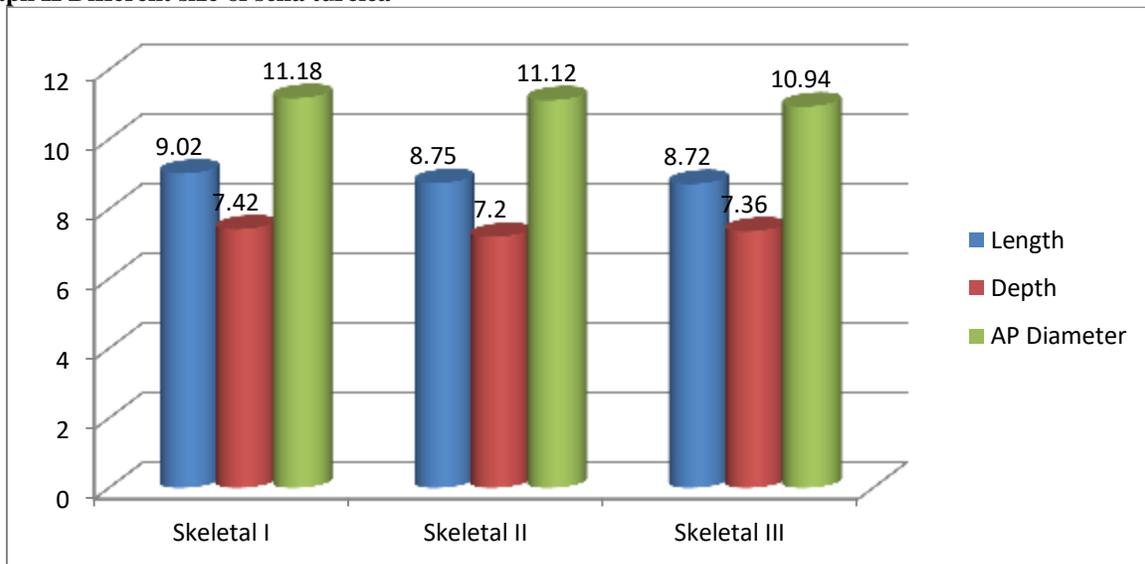


Table III Different size of sella turcica

Variable	Length	Depth	AP Diameter
Skeletal I	9.02	7.42	11.18
Skeletal II	8.75	7.20	11.12
Skeletal III	8.72	7.36	10.94
P value	0.91	0.94	0.92

Table III, graph II shows that mean length was 9.02 mm in class I, 8.75 mm in class II and 8.72 mm in class III patients. Mean depth was 7.42 mm in class I, 7.20 mm in class II and 7.36 mm in class III patients. Mean AP diameter was 11.18 mm in class I, 11.12 mm in class II and 10.94 mm in class III patients. The difference was non-significant ($P>0.05$).

Graph II Different size of sella turcica



DISCUSSION

Sella turcica on lateral cephalometric radiograph can be observed clearly and consecutively traced during cephalometric analysis.⁷ A larger size may be an indication of pituitary tumor over producing hormones such as an adrenocorticotropic hormone, prolactin, growth hormone, thyroid stimulating hormone, antidiuretic hormone. The enlarged sella turcica on a radiograph has been found to be associated with adenomas, meningioma, primary hypothyroidism, prolactinoma, gigantism, acromegaly, empty Sella syndrome, and Nelson syndrome.⁸ A small size may lead to decreased pituitary function causing symptoms such as short stature and retarded skeletal growth. Research concerning the sella turcica has focused on both size and morphology. A normal morphological variation of sella turcica varies greatly from individual to individual.⁹ The present study was conducted to assess size and morphology of sella turcica in different skeletal pattern.

In present study, out of 75 patients, males were 30 and females were 45. Nagaraj et al¹⁰ included lateral cephalometric radiographs of 200 subjects of which 100 males and 100 females in the age group of 8-30 years.

Linear dimensions which include the length, depth, and antero-posterior diameter were measured and the shape of sella turcica was analyzed. Morphology of sella turcica appeared to be normal shape (upper contour of anterior wall of sella turcica appears to be perpendicular to floor) in 46.5% of the study population and morphological variations in shape were seen in 53.5% of study population. Whereas size was considered there was statistically significant increase in the depth and antero-posterior diameter of sella turcica as age advanced. There was no significant difference in the linear measurements of sella turcica between males and females.

We found that in class I skeletal malocclusion, 14 patients had normal, 5 had notching, 4 had pyramidal and 2 had oblique shape, in class II, 9 had normal, 10 had notching, 1 had pyramidal and 5 had oblique shape, in class III, 12 had normal, 8 had notching and 5 had pyramidal shape.

Bodetti et al¹¹ included 24 cephalometric radiographs of patients (8 each of Skeletal Class-I, II & III) aged 9 to 22 years. The subjects were categorized into three groups Class I, II and III according to the skeletal classification (ANB). Results: The linear dimensions

were larger in older group than in a younger group ($p < 0.01$) when the age groups were considered. It was noted that there was significant difference in length between males and females ($p < 0.05$). There was significant difference was found in the length and diameter when skeletal types were compared to the sella size.

Badri et al¹² in their retrospective study conducted on the lateral cephalometric radiographs of 175 patients 15 years and above. The mean/SD age of the patients was 27.43 ± 7.54 . The mean/SD length, depth and A-P diameter of ST for male and females were 10.56 ± 1.68 , 7.83 ± 1.62 , 11.98 ± 1.90 , 7.00 ± 2.58 , 6.81 ± 1.64 , 10.17 ± 1.86 , respectively. There were significant differences ($p < 0.05$) between male and females in all ST size of all skeletal classes apart from the depth in both skeletal class I and II ($p > 0.05$). As for ST morphology 53% of patients had normal Sella shape. While comparing Sella shape with different skeletal classes there were significant differences with circular shape 55% in class I and flat shape 53.3% in class II patients.

CONCLUSION

Authors found that most patients had normal shape followed by notching. The size was found to be similar in all types of skeletal malocclusion.

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