

STUDY OF MANDIBULAR RAMUS BY METRIC PARAMETERS

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ABSTRACT

Background: Mandible is the movable bone of the skull which supports the teeth. The dimensions of the mandibular ramus help to locate the mandibular canal through which the neurovascular bundle will pass to supply the teeth. The mandibular ramus morphometry is important determinant of facial symmetry and the racial characters. The study was conducted with an aim to collect and evaluate the morphometric data of mandibular ramus in Telangana region.

Methods: The study was done on 80 dry, undamaged human adult mandibles of unknown gender. The condylar height, base to notch height and minimum breadth of mandibular ramus of both sides were measured using digital vernier callipers.

Results: The mean condylar height was 60.31mm. The base to notch height was 44.47mm. The mean minimum ramus breadth was 31.24mm.

Conclusion: The parameters used in the present study showed mandible to be having bilateral symmetry. The study will be helpful in quantifying the mandibular ramus dimensions of Telangana region.

KEY WORDS: Mandibular ramus, Condylar height, Mandibular symmetry

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INTRODUCTION

Mandible is the strongest bone in the face with a horizontally curved body that is convex forwards with two broad rami, which ascend from the posterior end of the body. It aids the survival of individual by crushing food and converting it into bolus. The mandible and maxilla together produce a force of impact as great as 150 to 300 pounds during mastication [1].

The dentition alters the mandibular dimensions, more so in childhood and old age. The dimensions of mandibular ramus are a guide for determining the position of mandibular foramen and canal. So, these dimensions are a priority for maxillofacial as well as plastic surgeons to preserve the neurovascular bundle passing through the mandibular canal.

Morphometry of mandibular ramus of population of a particular geographical region

has to be studied as there may be differences with other areas [2, 3, 4]. So this study was conducted to determine the dimensions of mandibular ramus as studies in South India are few.

MATERIALS AND METHODS

Materials: A sample of 81 adult human mandibles were collected from the anatomy department KIMS, Narketpally, Telangana and examined. The mandibles with complete dentition were included and those with damaged ramus or any pathology were excluded.

Method: The following dimensions of the mandible were measured using digital vernier callipers in millimetres.

BH: Distance between the base of the mandible to the highest point on the mandibular condyle (condylar height) [5] BN: Distance between the base of mandible to the incisure(notch) of mandible [6] AP: Minimum breadth of the ramus from anterior border to the posterior border [5].

Fig. 1: Measurement of condylar height.



Fig. 2: Measurement of minimum ramus breadth.



The results were tabulated and subjected to statistical analysis. A comparison of the mean

values between sides was performed using the paired 't'-test, p-value <0.05 was considered statistically significant.

RESULTS

The Condylar height (BH) was observed as 60.12±4.62mm in right and 60.51±4.17mm in left. The base to notch height (BN) was observed as 44.82±4.01mm in right and 44.12±4.15mm in left.

The minimum ramus width (AP) was observed as 31.23±3.21mm in right and 31.25±2.79mm in left. The values of the right and left side were compared and findings along with p value are depicted in the table below.

Table 1: Descriptive statistics of the Mandibular dimension.

Dimensions	Right side (mean±SD)	Left Side (mean±SD)	P value
BH	60.12±4.62mm	60.51±4.17mm	0.38
BN	44.82±4.01mm	44.12±4.15mm	0.69
AP	31.23±3.21mm	31.25±2.79mm	0.2

The bilateral difference in BH, BN and AP of the mandibular ramus was statistically not significant (all p values more than 0.05).

Disregarding the negligible difference between the right and left sides the mean height from Mandibular base to head (BH) in the present study was calculated to be 60.31mm. The mean height from Mandibular base to notch (BN) was found to be 44.47mm. The mean minimum breadth from anterior to posterior mandibular border (AP) was found to be 31.24mm.

DISCUSSION

Mandible forms the important bone of the facial skeleton which is horse shoe shaped and mandibular ramus maintains the contact with the skull by forming TM joint. The measurements of mandibular ramus are known to vary with age, race and regions in the same race.

The present study on mandibles from Telangana region was compared with other studies carried out on other geographic populations.

The mean height from Mandibular base to head in the present study was 60.31mm. This study was consistent with Saini et al conducted on

North Indian male population, Punarjeevan kumar et al [7] on Andhrapradesh population , Mbajiorgu et al [8] conducted on Zimbabwe male population but differed from radiological studies by Yassir [9] on Iraqui population, Noha Saleh et al [10] on Egyptian population.

Table 2: Condylar height of different populations studied by various authors.

Sl.no	Authorities	No.of mandibles observed	Race/Region	Mean Ramus Base to Condylar Height
1	Saini et al 2011[5]	92	NorthIndia (male)	60.67mm
2	Punarjeevan kumar et al 2013 [7]	80	Andhra Pradesh	61.98mm
3	Mbajiorgu et al 1996 [8]	23	Zimbabwe (male)	77.8mm
4	Yassir A Yassir 2013[9]	54	Iraq (male)	51.41mm
5	Noha Saleh 2015 [10]	105	Egypt (male)	84mm
6	Present study	81	Telangana	60.31

The mean (\pm SD) distance between the base of mandible and the mandibular notch was 44.47mm in present study. This finding of was consistent with Keros et al conducted on northern Croatian population but differed from radiological study by Rupa et al [11].

Table 3: Base to notch height of different populations studied by various authors.

Sl.no	Authorities	No.of mandibles observed	Race/Region	Base to Notch Height
1	Keros et al 1997 [6]	100	Northern Croatia	44.79mm
2	Rupa et al 2015 [11]	19	Mangalore (male)	59.2mm
3	Present study	81	Telangana	44.47mm

In the present study mean minimum breadth (BN) from anterior to posterior mandibular border was 31.24mm. This finding was consistent with Saini et al and Punarjeevan kumar et al but differs with Keros et al.

Table 4: Minimum ramus breadth of different populations studied by various authors.

Sl.no	Authorities	No.of mandibles observed	Race/Region	Minimum Ramus Breadth
1	Saini et al 2011 [5]	92	North India (male)	31.29mm
2	Punarjeevan kumar et al 2013 [7]	80	Andhra Pradesh	30.50mm
3	Keros et al 1997 [6]	100	Northern Croatia	24.87mm
4	Present study	81	Telangana	31.24mm

It was further observed that the measurements of right and left sides were almost similar thus establishing the symmetry.

CONCLUSION

The present study showed the mean height from

mandibular base to condyle to be 60.31 ± 4.39 mm while that from mandibular base to mandibular notch to be 44.47 ± 4.08 mm. The mean breadth between anterior and posterior edge of ramus was shown to be 31.24 ± 3 mm. The present study demonstrated the symmetry of mandibular ramus of both sides.

The findings of the present study can be used for preoperative planning and postoperative outcome of maxillofacial, plastic and neurosurgeries. More such studies including radiological will help in quantification of mandibular features of Telangana region.

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Conflicts of Interests: None

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