



MORPHOLOGICAL STUDY OF CORONOID PROCESS OF MANDIBLE IN INDIAN POPULATION

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ABSTRACT **BACKGROUND:** The mandible is the largest, strongest and lowest bone of the face. Coronoid process of the mandible presents various morphological variations by the corresponding developmental variations.
AIM AND OBJECTIVE: To observe the shape of the coronoid process
MATERIAL & METHODS: 60 mandibles (30 male & 30 Female) of known sex were obtained from the Department of Anatomy, G.M.C.H. and R.N.T. Medical College Udaipur.
RESULTS: we observed that the Triangular shape of coronoid process predominant and hook shape was least common.
CONCLUSION: The shape of coronoid process of mandible is very helpful in anthropological forensic practice.

KEYWORDS : Coronoid process, Anthropological, Mandible

INTRODUCTION:

The mandible is the largest, strongest and lowest bone of the face. The mandible has a curved body that is convex forwards and two broad rami that ascend posteriorly. The ramus has a coronoid and condylar processes [1].

The coronoid process of mandibles projects upwards and slightly forwards as a triangular plate of a bone [1].

The shape and size of coronoid process is influenced by dietary habit, genetic constitution, Hormonal activities and mainly by temporalis muscle activity [2].

The Varying forms of coronoid process in adult human mandibles are of three types namely Hook, Rounded & Triangular [3,4].

The shape of coronoid process of mandible is very helpful in anthropological and forensic practice [5].

The coronoid process is of clinical significance to the maxillofacial surgeons for reconstructive purpose [6].

The present study was undertaken to observe the various shapes of coronoid process of adult human mandible.

AIM AND OBJECTIVES:

To observe the various shapes (Hook, Rounded & Triangular) of the coronoid process (Figure -1,2,3&4)

MATERIAL & METHODS:

60 mandibles (30 male & 30 Female) of known sex were obtained from the Department of Anatomy, G.M.C.H. and R.N.T. Medical College Udaipur.



Figure-1: Triangular Shape



Figure-2: Round Shape



Figure-3: Square Shape



Figure-4: Hook & Round Shape

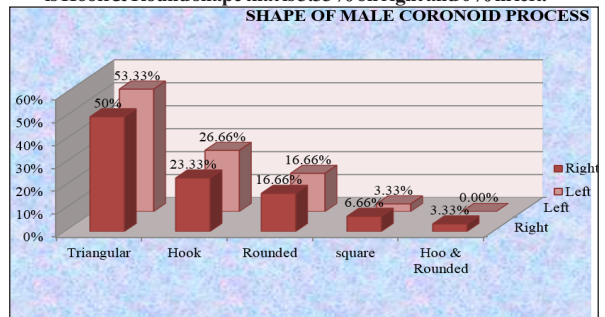
RESULTS:

- The comparisons of shape of Coronoid process in Male (Right & Left). Table No.1 & Graph No.1

Table No.1: Comparison Of Shape Of Male (right & Left) Coronoid Process

SIDE	SHAPE				
	Triangular	Hook	Rounded	Square	Hook & Rounded
RIGHT	15 (50%)	7(23.33%)	5 (16.66%)	2(6.66%)	1(3.33%)
LEFT	16(53.33%)	8(26.66%)	5(16.66%)	1(3.33%)	0 (0%)

- The most common shape of coronoid process in male (Right & Left side) is triangular. We observed that the shape of coronoid process in case of male is 50% on right side and 53.33% on left side.
- The least common shape of coronoid process in male (right & left) is Hook & Round shape that is 3.33% on right and 0% in left.



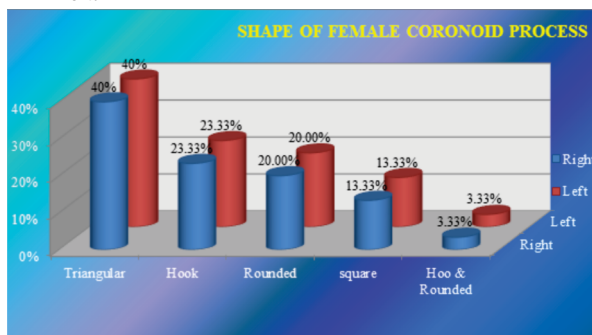
Graph No.1: Comparison Of Shape Of Male (right & Left) Coronoid Process.

- The comparisons of shape of Coronoid process in Female (Right & Left). **Table No.2 & Graph No.2**

Table No.2: Shape Of Female (right & Left) Coronoid Process.

SHAPE		Triangular	Hook	Rounded	Square	Hook & Rounded
RIGHT		12(40%)	7(23.33%)	6(20.0%)	4(13.33%)	1(3.33%)
LEFT		12(40%)	7(23.33%)	6(20.0%)	4(13.33%)	1(3.33%)

- The most common shape of coronoid process in Female (Right & Left side) is triangular. We observed that the shape of coronoid process in case of female is 40% on right side and 40% on left side.
- The least common shape of coronoid process in male (right & left) is Hook & Round shape that is 3.33% on right and 3.33% on left.



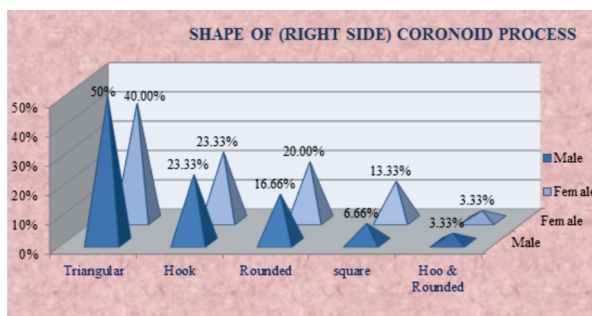
Graph No.2: Comparison Of Shape Of Female (right & Left) Coronoid Process.

- The Comparisons Of Shape Of Coronoid Process In Male & Female (right Side). **Table No.3 & Graph No.3**

Table No.3: Comparison Of Shape Of Male & Female (right Side) Coronoid Process.

SHAPE		Triangular	Hook	Rounded	Square	Hook & Rounded
MALE		15(50%)	7(23.33%)	5(16.66%)	2(6.66%)	1(3.33%)
FEMALE		12(40%)	7(23.33%)	6(20.0%)	4(13.33%)	1(3.33%)

- The most common shape of coronoid process on right side in male & female is triangular.
- The least common shape of coronoid process on right side in male & female is Hook & Round shape.

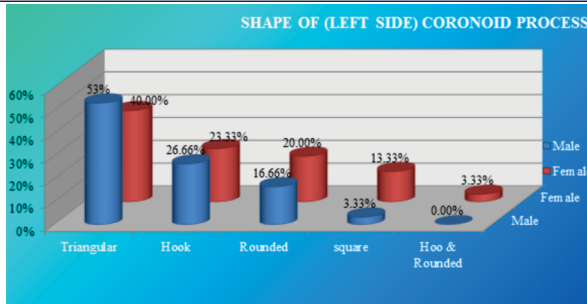


Graph No.3: Comparison Of Shape Of Male & Female (right Side) Coronoid Process.

- The comparisons of shape of Coronoid process in Male & Female (Left side). **Table No.4 & Graph No.4**

Table No.4: Comparison Of Shape Of Male & Female (left Side) Coronoid Process.

SHAPE		Triangular	Hook	Rounded	Square	Hook & Rounded
MALE		16(53.33%)	8(26.66%)	5(16.66%)	1(3.33%)	0(0%)
FEMALE		12(40%)	7(23.33%)	6(20.0%)	4(13.33%)	1(3.33%)



Graph No.4: Comparison Of Shape Of Male & Female (left Side) Coronoid Process

DISCUSSION:

The coronoid process of mandible is a thin, triangular eminence or a beak like projection, which is flattened from side to side, at the antero-superior aspect of the ramus [1].

The shape of coronoid process of mandible is very helpful in anthropological forensic practice [5].

The coronoid process is of clinical significance to the maxillofacial surgeons for reconstructive purpose as it is used as grafts in reconstruction of osseous defect in oral and faciomaxillary region like alveolar defects, orbital floor repair, maxillary augmentation, correction of nonunion fracture of mandible [6].

The present study compares the shape and size of coronoid process with other studies.

Comparisons of Shape of Coronoid process between present study with other Studies; **Table No.5**

- Isaac, B; HOLLAS.J.[2001]** observed that the shape of coronoid process in 79.6% was the same bilaterally and only in 20.4% did the presentation differ between sides. The triangular and rounded types were the most and least prevalent in males (46.5% and 23.5% respectively), while in female the triangular and hook shaped types were the most and the least prevalent (53.5% and 22.8% respectively) [3].

In contrast, in my study about the shape of coronoid process in 96.66% was the same bilaterally and only in 3.33% did the presentation differ between sides. The triangular and rounded types were the most and least prevalent in males (51.66% and 16.66% respectively), as same as in female (40% and 20%) respectively.

- R. Sudha, Shanta chandrasekaran et al [Aug,2013] :** Anatomical variations in shape can result in narrowing of the vestibular space due to the close proximity of the medial aspect of the coronoid process to the distal molar tooth and cause impingement, resulting in restriction of mouth opening and mandibular hypermobility. Total of 125 dry human mandible of south indian population in which Triangular 60.8%, Rounded 14% and Hook in 25.6%. Hook shapes was found bilaterally in 28.8%. In Edentulous bone Hook type of coronoid process was found in 53.3% and there was no incidence of rounded type bilaterally [8].

In contrast to our study Total of 60 mandibles in which 30 male and 30 female we were found Triangular 50%, Rounded 16.66%, Hook in 23.33% and others 9.99% on right side and on left side Triangular 53.33%, Rounded 16.66%, Hook in 26.66% and others 3.33% in males. In females Triangular 40%, Rounded 20%, Hook 23.33% and others 16.66% on both side

- Mouna Subbaramaiah, Roshni Bajpe, S.R. Jagannatha K.S. Jayanthi [Feb,2015]:** The various presentations of coronoid process were observed and broadly classified, on both the sides. Statistical analysis was calculated using Chi-square test. Hook shaped coronoid process was the most predominant type (61.5%) followed by triangular (14%) and rounded (12.5%) types. About 12% belonged to the miscellaneous type. Hook shape coronoid process was significantly higher in female. The other shape did not show any significant gender variation [12].

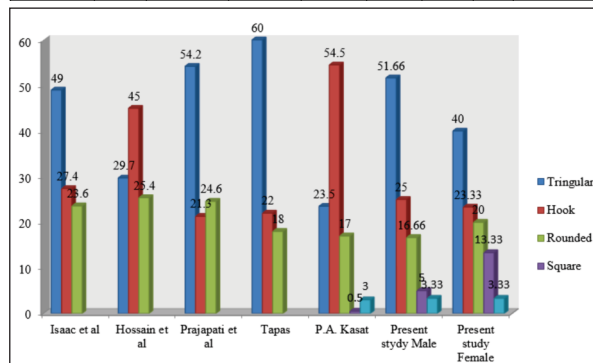
In present study the triangular shape coronoid process most predominant in both genders (Male & Female).

- **PriyankBhabhor, Bina Katariya, ParasShrimankar [April,2015]**-hook shaped coronoid process in males was found in 89 (44.12%), triangular in 54 (27.27%) and rounded in 55 (27.78%) . Hook shaped coronoid process in females was found in 37 (45.12%), triangular in 29 (35.37%) & rounded in 16 (19.51%). In 88.57% mandibles the type of coronoid process was the same bilaterally and only in 11.43% mandibles did the presentation differ between sides [14].

In contrast, in my study of the total 60 sides of male mandibles, the hook shaped was found in 15(25%), triangular in 31(51.66%), rounded in 10(16.66%) & others in 4(8.33%). Of the 60 sides of male Mandibles, the hook shaped was found in 14(23.33%), triangular in 24(40%), rounded in 12 (20.0%) & others in 10 (16.66%). In this study in 96.66% of coronoid process was the same bilaterally and only in 3.33% differ between sides.

Table No.5: Showing Comparison Of Shape Of Coronoid Process Between Present Study With Other Studies.

Study	Year	Country	Sample size	Types of coronoid process (%)				
				Triang-ular	Hook	Roun-ded	Squ-are	Hook & Rounded
Isaac et al.	2011	India (Tmil Nadu)	157	49.0	27.4	23.6		
Hossain et al.	2011	Banglade-sh	140	29.7	45.0	25.4		
Prajapati et al.	2011	India (Gujrat)	120	54.2	21.3	24.6		
Tapas	2014	India (New Delhi)	50	60.0	22.0	18.0		
P.A. Kasat et al.	2016	India	100	23.5	54.5	17.0	0.5	3.0
Present study Male		India	30	51.6	25.0	16.66	5.0	3.33
Present study Female		India	30	40.0	23.3	20.0	13.3	3.33



Graph No.5: Comparison Of Shape Of Coronoid Process Between Present Study With Other Studies.

SUMMARY AND CONCLUSION

- In cases of trauma, deformities, tumours, temporomandibular joint ankylosis and facial paralysis, the knowledge of the morphological shape of coronoid processes is beneficial for the reconstructive maxillofacial surgeons.
- It makes an excellent donor graft site for reconstruction of orbital floor deformities. It is seen that coronoidectomy effective for the treatment of coronoid Hyperplasia & coronoid pseudo ankylosis. It is also useful for Maxillary augmentation, non-union fracture of mandible, alveolar defects.

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