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Research Article

ANATOMICAL STUDY OF VARIOUS SHAPES OF THE CORONOID PROCESS OF HUMAN MANDIBLE

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ABSTRACT

Coronoid Process of Mandible is a upward projection from the anterosuperior part of the ramus. The aim of this study was to observe the variation in the shape of coronoid process. The morphological appearance of the coronoid processes of both sides of 64 (128 sides) dry human mandibles, 35 males and 29 females mandibles, from Department of Anatomy, K.D. Medical College Hospital and Research Centre, Mathura, Uttar Pradesh And Department of Anatomy, SGT Medical College Hospital & Research institute Budhera Gurgaon, Haryana India. Three types of variations in the shape were evident. 1. Rounded 2.Triangular 3. Hook shaped. Round shaped coronoid process was found in 36(28.12%) sides, Triangular shaped process in 80(62.51%) and hook shaped in 12(9.37%) sides. The incidence of the round shaped of coronoid process was found in slightly more in the female mandibles, the triangular shape and hook shaped of coronoid process was present more in male's mandibles.

INTRODUCTION

The mandible is the largest, strongest bone in the face. It has a horizontally curved body that is convex forwards, and two broad rami that ascend posteriorly. The rami bear the coronoid and condyloid processes. The coronoid process projects upwards and slightly forwards as a triangular plate of bone. Its posterior border bounds the mandibular incisurae, and its anterior border continues into that of ramus.[1] The mandible's Coronoid process (from Greek korone, "like a crown") is a thin, triangular eminence, which is flattened from side to side and varies in shape and size. The process projects upwards and slightly forwards. It has a top border and it is convex in its shape, while its lower part is concave in shape. The term coronoid process is given to the two entirely different structures that are found inside the human body. The first structure is seen in jawbone, mandible and another one is seen in ulna, a long bone which is found in forearm.[2] Morphological variations are produced by the corresponding developmental variations through hereditary determinants and the functional changes that take place during the growth process. The muscle and bone may dynamically affect the function of each other and lead to the changes in the morphology of the bone involved.[3] In lower animals separate coronoid bones are present which articulate with the splenial, angular, suprangular bones etc to form a common "dentarybone" which is homologous to mandible in humans.[4] The Coronoid process is a flattened (side to side) triangular projection from anterosuperior part of ramus of the mandible.[5] The Coronoid process is of clinical significance to the maxillofacial surgeons for reconstructive purposes. The present study was to detect the variations in the shape of coronoid process of dry human mandibles in relation to sex.

MATERIALS AND METHODS

The present study was undertaken in sixty Four dry human mandibles (128 sides) collection from the Department of Anatomy, K.D. Medical College Hospital and Research Centre, Mathura and Department of Anatomy, SGT Medical College Hospital & Research institute budhera Gurgaon, Haryana India Out of 64 mandibles 35 were of males and 29 females.

OBSERVATION AND RESULTS

Depending on The shapes of the coronoid processes of mandibles, they were classified into three types: 1. Triangular 2. Rounded 3. Hook shaped.

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Figure 1 Triangular coronoid process

Figure 2 Rounded coronoid process

Figure3 Hook shaped coronoid process

Of the 64 (128 sides) dry adult human mandibles, 35 males and 29 females mandibles, The triangular shape of coronoid process (type 1) in this type of coronoid process of mandibles we found with a tip pointing straight upwards (fig. 1) was seen in 40 (80 sides) mandibles that is, in 22 (44 sides) mandibles bilaterally while in 18 (36 sides) mandibles it was found unilaterally. The Rounded shape of coronoid process (type 2) with a tip Rounded upwards (fig. 2) was seen in 18 (36 sides) mandibles that is, in 10 (20 sides) mandibles bilaterally while in 8 (16 sides) mandibles it was found unilaterally. The Hook shape of coronoid process (type 3) with a tip hook upwards backward toward the condyloid process of mandible (fig. 3). It was seen in 6 (12 sides) mandibles that is, in 4(8 sides) mandibles bilaterally while in 2(4 sides) mandibles it was found unilaterally. (Table I, Fig. 4).

Table 1 Distribution of various shapes of coronoid process of mandibles

Types	Shapes of coronoid process	Percentage	Bilateral	Unilateral	
				RIGHT	LEFE
1	Triangular	80(62.51%)	44	23	13
2	Rounded	36(28.12%)	20	9	7
3	Hook	12(9.37%)	8	2	2

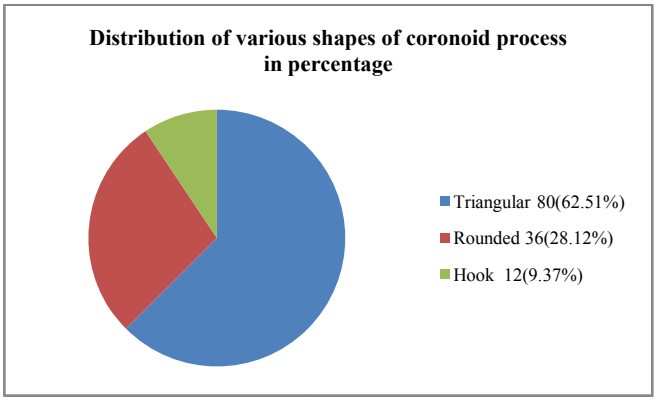

Figure 4 Percentage of various shapes of coronoid process of mandible

In the present study we found that 35(70 sides) mandibles belonging to males, in these mandibles the triangular shaped coronoid process was found in 52 sides (74.28%), round shaped in 10 sides (14.28%) and hook shaped in 08 sides (11.42%) and we also found 29(58 sides) mandibles belonging to females, In females mandibles, the coronoid process was triangular shaped in 28 sides (48.27%), rounded in 26 sides (44.82%) and hook shaped in 4 sides (6.89%). (Table II, Fig.5).

Table 2 Gender wise distribution and incidence of shapes of coronoid process of mandibles

S. No.	Gender	Triangular	Rounded	Hook
1.	Male =35(70 sides)	52 (74.28%)	10(14.28%)	08 (11.42%)
2.	Female =29 (58 sides)	28 (48.27%)	26 (44.82%)	04 (6.89%)

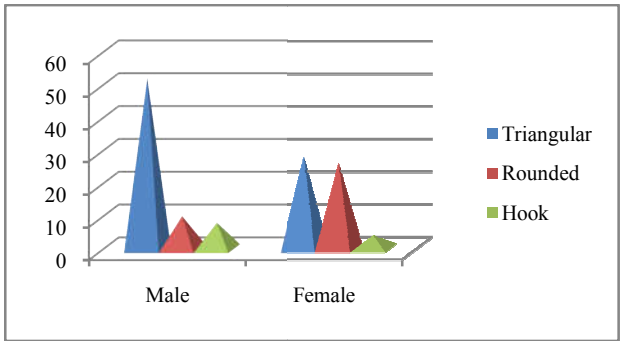

Figure 5 Gender wise distribution of shapes of coronoid process mandibles

Table 3 Comparison between others studies of coronoid process of mandible

Authors	Types of Coronoid Process		
	Triangular	Rounded	Hook Shaped
Issac B *et al*(2001)	49%	23.6%	27.4%
Tanveer A *et al*(2011)	67%	3%	30%
Vipul *et al*(2011)	54.17%	24.58%	21.25%
Nirmale *et al*(2012)	65%	7%	28%
Dr Smita Tapas(2014)	60%	18%	22%
Pradhan S *et al*(2014)	46.73%	35.3%	17.93%
Present Study(2019)	62.51%	28.12%	9.37%

DISCUSSION

The coronoid process develops as a discrete entity within the mass of the temporalis muscle anlage, it unites with the main part of mandibular ramus at approximately eight weeks of age.[6] The coronoid process, the word coronoid meaning 'crow', has been described as one of the bony processes of the ramus of the mandible.[7] Triangular coronoid processes have been illustrated by.[8,9,10] The Results and observations of this study (2019) was compared with the data from other study described by different authors. In this study we found the triangular and hook shaped types were the most and the least prevalent in males (62.51% and 9.37%) which was similar to (Vipul P Prajapati *et al*., 2011)[2] study. They found the triangular and hook shaped types were the most and the least prevalent in males (56% and 21.34%). Another study done by (S. Pradhan *et al*. 2014)[4] They also found the triangular and hook shaped types were the most and the least prevalent in males (46.73% and 17.93%). But according to (Isaac and Holla *et al*.2001)[11], (Tanveer A *et al*.2011)[12], (Nirmale *et al*.2012)[13], (Dr Smita Tapas.2014)[14] They were found triangular and rounded were most and least prevalent respectively. The difference in the shape of coronoid process had been attributed to the various factors like attachment and action of temporalis muscle, unilateral chewing habit and hormonal factors.[3]

In the Table II and fig.5 in both sexes incidence of triangular shaped (57.50%) and hook shape coronoid process (75.01%) was highest in males than females (42.50), (25.0%). The Round shaped coronoid process was more in females (55.55%) than in males (44.44%). This result was compare with the (R Sudha *et al*.2013)[15] study they found the triangular shaped (44%) and hook shape (15.6%) coronoid process was highest in males, whereas in female it was (16.8%), (10%) in females. study done by (S. Pradhan *et al*., 2014)[4] they found that the triangular shaped (45.83%) and hook shape (21.87%) coronoid process was highest in males, whereas in female it was (47.72%), (13.63%) in females, and the round shaped coronoid process was more in females (38.63%) than in males (32.29%). Our results were similar to (S. Pradhan *et al*. 2014 and R Sudha *et al*. 2013)[4,15] Findings.

CONCLUSION

The anatomical study of various shapes of the coronoid process of human mandible suggest that the triangular shape of the coronoid process was most found in both males and females followed by round and then hook shaped. Knowledge of the morphological shapes of the coronoid process and these data will be useful for the maxillofacial surgeon and plastic surgeons for reconstructive purposes as it is used as graft in reconstruction of osseous defects in oral and facio-maxillary augmentation, correlation of non-unionfracture of the mandible. It is useful in anthropological studies and forensic medicine which are confined to know the sex of the mandibles in medico-legal and forensic odontology cases.

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References

1. Susan Standring. Gray's anatomy. 40th ed. London: Churchill Livingstone Elsevier; 2008. 530-32 p.
2. Prajapati Vipul P, Malukar Ojaswini, Nagar SK. Variations in the morphological appearance of the coronoid process of human mandible. NJMR.2011Oct-Dec;1(2):64-6.
3. Shakya S, Ongole R, Nagraj SK. Morphology of Coronoid Process and Sigmoid Notch in Orthopantomograms in South Indian Population. World J Dent. 2013Jan-Mar;4(1):1-3.
4. Pradhan S, Bara DP, Patra S, Nayak S, Mohapatra C. Anatomical Study of Various Shapes of Mandibular Coronoid Process in Relation to Gender & Age. IOSR-JDMS. 2014Aug;13(8): 9-14.
5. Singh Vishram.Textbook of Anatomy Head, Neck and Brain. 2nd ed, vol. 3. Elsevier India Privated Limited; 2017. 26 p.
6. Meropi N. Spyropoulos. The morphogenetic relationship of the temporal muscle to the coronoid process in human embryos and fetuses. Am. j. anat. 1977 Nov;150(3): 395–409.
7. Field EJ, Harrioson RJ. Anatomical terms Their origin and derivation. 1st ed. Cambridge: W. Heffer & Sons Ltd; 1947. 34 p.
8. Hamilton WJ. Textbook of Human Anatomy In: Locomoter system 2nd Ed. London: Macmillan; 1976. 80 p.
9. Romanes GJ. Cunningham's Manual of Practical Anatomy, Head, Neck and Brain. 15th ed., vol. 3, Oxford: Oxford University Press; Reprinted 2010. 119 p.
10. Snell, R. S. Clinical Anatomy for Medical Students In: The head and neck. 3rd Ed. Boston: Little Brown and Company (Inc.); 1986. 773 p.
11. Isaac B, Holla SJ. Variations in the Shape of the Coronoid Process In the Adult Human Mandible. J Anat. Soc. India.2001; 50(2): 137-9.
12. Tanveer ahamed Khan HS, Sharieff JH. Observation On morphological Features of Human Mandibles In 200 South Indian subjects. Anatomica Karnataka. 2011; 5(1):44-9.
13. Nirmale VK, Mane UW, Sukre SB, Diwan CV. Morphological Features of Human Mandible. Int J of Recenttrends In Sci Technol. 2012; 3(2): 38-43.
14. Tapas Smita. Morphological Variations of Coronoid Process in Dry Adult Human Mandibles. Indian Journal of Basic and Applied Medical Research.2014March; 3(2): 401-5.
15. Sudha R, Chandrasekaran Shanta, Aruna N. Study of morphological variations in the shapes of coronoid process of mandible in South Indian population. IJCRR.2013May; 5(10): 84-90.

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