

# Cadaveric study of type of mandibular coronoid process in Marathwada region

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## Abstract

**Background:** The mandibular coronoid process is a thin and triangular eminence which is flat from side to side and varies in its shape and size. **Objectives:** To study various types of coronoid processes in cadavers at rural tertiary care hospital. **Material and Methods:** Total of 70 dry mandibles were examined for types of coronoid process in medical colleges of Marathwada region. **Results:** Out of 140 sides most common type seen in this study was hooked variety (44%), next common was rounded variety seen in 35% cases. In males hooked variety was most commonly seen in 40 (57%) and while in females rounded variety was most common seen in 32(45%) cases. Hook variety was significantly higher in males and rounded coronoid process was significantly higher in female mandibles. ( $p < 0.05$ ), none of the types were associated significantly with either of the sides in any of the gender. But bilaterally similarity in 101 (72%) out of 140 sides in shape was quite notable. **Conclusions:** Hooked shape was seen as most common variety of coronoid process in this study. Hooked variety in males and rounded variety in females was seen significantly higher than rest varieties.

**Keywords:** Coronoid process, Hooked, Rounded, Triangular shapes.

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## INTRODUCTION

The coronoid process derived from a Greek word korone (meaning crow's beak) is a flat piece of triangular bone projecting upwards from the anterior margin of the mandibular ramus.<sup>1</sup> The coronoid process of mandible is a thin and triangular eminence which is flattened from side to side and varies in the shape as well as size. The different variation in the shape of the coronoid process are like rounded, triangular and hook shaped.<sup>2</sup> These different shapes of the coronoid process acts as an evolutionary marker and is very useful in the anthropological and the forensic studies. The coronoid

process has also great clinical significance to the maxillofacial surgeons for the reconstructive surgeries.<sup>3</sup> The common treatment involves the sectioning of the coronoid process. So far, four shapes of the coronoid process of mandible, have been documented, being, triangular, hooked and rounded and miscellaneous. The most common shape being triangular followed by hooked.<sup>4</sup> Presence of double or second coronoid process has also been cited.<sup>5</sup> The coronoid process is ossified from membrane, it also shows less resorption. Autogenous bone grafts can be obtained from ilium, rib and calvarias; but each site has its own associated morbidity.<sup>6</sup> Its margins and medial surface give attachments to temporalis muscle. The coronoid process is of clinical significance to the maxillofacial surgeon for reconstructive purposes. This study was undertaken to note the forms of presentation and their prevalence in dry adult human mandibles.

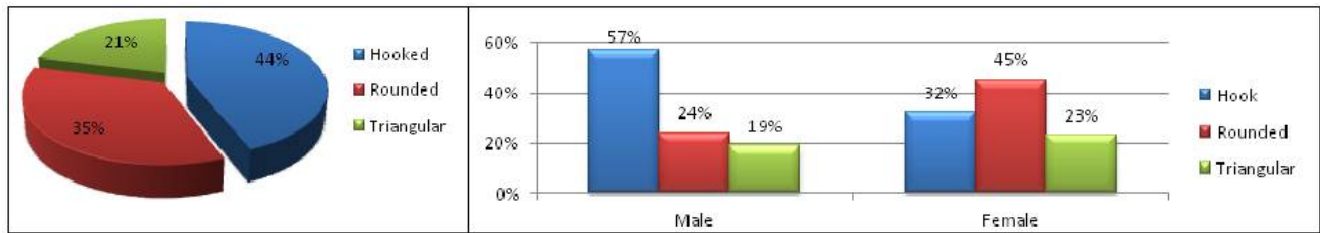
## MATERIAL AND METHODS

The present study was carried out in the Department of Anatomy of medical colleges of Marathwada region. A total of 70 dry adult human mandibles were included in

the study which consisted of 35 male and 35 female mandibles. The heaviness of bones, muscular markings on bones, shape of the chin and gonial eversion were the criterias for differentiating into male or female.<sup>7</sup> The mandible bones with damaged, broken coronoid process were excluded from the study. The coronoid process of both the sides were included, a total of 140 sides.

Coronoid process were examined carefully for any variation in their shapes. The shapes were classified into hook shaped, rounded and triangular.<sup>1</sup> The shapes were studied bilaterally and in both the genders. Data was entered into Microsoft excel and analyzed using SPSS version 17 for p value. P value of <0.05 was taken as significant.

**RESULTS**



**Figure 1**

**Figure 2**

Most common type seen in this study was hooked variety (44%), next common was rounded variety seen in 35% cases. In males hook variety was most commonly seen in 40 (57%) and while in females rounded variety was most common seen in 32(45%) cases. Hook variety was significantly higher in males and rounded coronoid process was significantly higher in female mandibles.(p<0.05).

**Table 1: Distribution as per side**

Type	Male		Total (%)	Female		Total (%)	p value
	Bilateral (%)	Unilateral (%)		Bilateral (%)	Unilateral (%)		
Hook	31(78)	9(22)	40 (57)	17(77)	5(23)	22(32)	>0.05
Rounded	9(53)	8(47)	17 (24)	24(75)	8(25)	32(45)	
Triangular	9(69)	4(31)	13(19)	11(69)	5(31)	16(23)	

Table 1 showed distribution of coronoid process types into both sides, none of the types were associated significantly with any side in any of the gender. Also bilaterally similarity in shape was quite notable.

**DISCUSSION**

This was cross sectional observational study done on dry mandibular bones examined from various medical colleges in Marathwada region of Maharashtra. Total of 140 sides means, 70 mandibles, 35 each of male and female gender were examined for coronoid shape variability. In this study most common coronoid process shape seen was hooked variety which formed 62 (44%), next common shape seen was rounded variety seen in 48 (35%) cases and least common shape seen was triangular variety seen in 30 (21%). Subbaramaiah M *et al*<sup>8</sup> study also found hooked shape of coronoid process as most common in their study, they found hooked shape in 61.5%, this finding was in accordance with our study. Meril Ann Soman<sup>9</sup> study observed hooked variety as most common in 45%. In a study done by Ranganath P *et al*<sup>10</sup> most common shape seen was hooked type in 53.7% cases. Hossain SMA *et al*<sup>11</sup> study also supported (45%) our findings. While we have found that second most common shape as rounded (35%) Subbaramaiah M *et al*<sup>8</sup> had second most common shape as triangular 14%, this was not in accordance with this study.. In many studies

triangular shape was seen as most common variety like Khan TA *et al*<sup>12</sup> (67%), Isaac B *et al*<sup>13</sup> (46.5%) and Tapas S *et al*<sup>14</sup> (60%). This variation is may be due to different region of study, nutritional and genetic factors, also may be due to fewer sample size in our study. In this study in males the hooked variety was most commonly seen in 40 (57%) and while in females rounded variety was most commonly seen in 32(45%) cases. Second common shape in males was rounded shape in 17 (24%) and then triangular shape in 13 (19%). While in females next common shapes were hooked in 22 (32%) and triangular in 16 (23%). Hooked variety was significantly higher in males and rounded coronoid process was significantly higher in female mandibles.(p<0.05), this was supported by Subbaramaiah M *et al*<sup>8</sup> study. Table 1 showed distribution of coronoid process types into both sides, none of the types were associated significantly with any side in any of the gender. Also bilaterally similarity in shape was quite notable. Out of all cases examined bilaterally similarity in shapes was seen in 101 (72%) cases. This distribution of sides among various shapes of coronoid process was comparable with a study done by

Meril Ann Soman<sup>9</sup> and Parveen S *et al.*<sup>15</sup>The variations within the form of process could result in narrowing of vestibular areas because the coronoid process lies in shut relation with the distal molar tooth. it should cause impingement and end in restriction of mouth gap and jaw hypomobility.<sup>16</sup> The variations within the shape could also be because of organic process habits, hereditary factors, genetic factors and activity factors. The temporalis muscle attachment plays a significant role because the muscular pull will alter the shape of coronoid process markedly.<sup>8,13</sup> The much variability in the coronoid process shapes noted in the present study can be associated to the variation in socio demographic profile, genetics, nutritional profile of the cases which might have some sort of effect on the size of the temporalis muscle

responsible for various shapes of the coronoid process.<sup>17,18</sup>

## CONCLUSION

Hooked shape was seen as most common variety of coronoid process in this study. Detailed knowledge of various shapes may enhance surgery as in maxillo-facial surgeries, especially during reconstructive surgeries. It is also very crucial to anatomists, anthropologists and forensic experts.

## REFERENCES

1. Susan Stranding ed. Gray's Anatomy: The Anatomical basis of clinical practice 40th Ed. Churchill Livingstone, Elsevier; 2008, 530-533.
2. Standring S, Collins P, Healy JC, Wigley C, Beale TJ. Mandible: Infratemporal and pterygopalatine fossae and temporomandibular joint. Grey's Anatomy-The Anatomical Basis of Clinical Practice, Fortieth edition. Churchill Livingstone, Elsevier. 2008:530-532.
3. Shakya S, Ongole R, Nagraj SK. Morphology of Coronoid Process and Sigmoid Notch in Orthopantomograms in South Indian Population. World J Dent. 2013; 4:1-3.
4. Satoh J, Ohno D, Aizawl T *et al.*, Bilateral coronoid hyperplasia in an adolescent: report of a case and review of literature. Journal of oral Maxillofacial surg 2006; 64:334-38.
5. Kansu HO, Akgunlu F Bifid coronoid process. Oral surgery, Oral Medicine, Oral Pathology, 1994; 78(2): 136
6. Sudha R, Chandrasekaran S, Aruna N, Study of morphological variations in the shapes of coronoid process of mandible in South Indian population, IJCRR, May 2013;5(10): 84-90.
7. Standring S, Collins P, Healy JC, Wigley C, Beale TJ. Mandible: Infratemporal and pterygopalatine fossae and temporomandibular joint. Grey's Anatomy-The Anatomical Basis of Clinical Practice, Fortieth edition. Churchill Livingstone, Elsevier. 2008: 530-532.
8. Subbaramaiah M, Bajpe R, Jagannatha SR, Jayanthi KS. A Study of Various Forms of Mandibular Coronoid Process in Determination of Sex. Indian Journal of Clinical Anatomy and Physiology 2015;2(4):199-203.
9. Meril Ann Soman. A study of variations in the shape of coronoid process in dry adult human mandibles. *International Journal of Bioassays* 7.3 (2018) pp. 5612-5615.
10. Ranganath, P., Manjunath K.Y., Balasubramanya. ; The varying shape of coronoid process of the mandible. Indian Journal of Dental Research, 2004; 15(3): 96-98.
11. Hossain SMA, Hossain SMM, Banna FAMH. Variations in the shape of coronoid process in adult human mandible. Bangladesh J Anat 9.2 (2011): 75-78.
12. Khan TA, Shariieff JH. Observation on morphological features of human mandibles in 200 south Indian subjects. Anatomica Karnataka 5.1 (2011): 44-49.
13. Isaac B. and Holla S. J. Variations in the shape of coronoid process in the adult human mandible. Journal of Anatomical Society of India 2001; 50(2): 137-139.
14. Tapas S. Morphological variations of coronoid process in dry adult human mandibles. Indian J Basic Appl Med Res 3.2 (2014): 401-405.
15. Parveen S , Akhtar J, Kumar S, Kumar A, Kuma V. A morphological study of coronoid process of adult human dry mandibles. JMSCR;Vol 06(04):155-161.
16. Pradhan S, Bara DP, Patra S, Nayak S, Mohanpatra C. Anatomical study of various shapes of mandibular coronoid process in relation to gender and age. IOSR J Dent Med Sci 13.8 (2014): 9-14.
17. Avis. V; The relation of the temporal muscle to the form of coronoid process. American Journal of Physical Anthropology, 1959; 17: 99-104.
18. Meopi N Syropoulos; The morphogenetic relationship of the temporalis muscle to the coronoid process in human embryos and fetuses. American Journal of Anatomy, April 1977; 150:395-410.

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