Variations in the shape of the coronoid process in the adult human mandible

Sam Jebaraj1, Saravana Kumar2*

ABSTRACT

Objective: The aim of this study is to evaluate the variations in the shape of coronoid process in the adult human mandible. Methods: The shape of the coronoid processes of both sides of 103 dry adult human mandibles, 67 males and 36 females of Indian origin, was studied to classify the variations. Three types were evident: (1) Hook shaped, (2) triangular, and (3) rounded. Results: Hook-shaped coronoid processes were found in 56 (27.4%) sides, triangular in 101 (49%), and rounded in 49 (23.6%) sides. Hook-shaped coronoid processes were found bilaterally in 23, triangular in 42, and rounded in 17 mandibles. Of the remaining 21 mandibles, the appearances were different on both the sides. Conclusion: The incidence of the rounded type was almost equal in male and female mandibles; in the triangular type, it was slightly more in the female mandibles while the hook-shaped type was slightly more in the male mandibles.

KEY WORDS: Coronoid, Mandible, Osteology

INTRODUCTION

The coronoid process of the mandible, as described in textbooks, is a somewhat flat, triangular process projecting upward and slightly forward. Its borders and the medial surface give attachments to a muscle called temporalis. For the reconstructive purposes, the maxillofacial surgeons consider this coronoid process as clinically significant one. This study was done to evaluate the variations and their prevalence in dry adult human mandibles.

MATERIALS AND METHODS

The study was conducted on 157 dry adult human mandibles (314 sides), 100 males and 57 females of Indian origin, to determine the variations in the shape of the coronoid process.

OBSERVATIONS AND RESULTS

Shapes of Coronoid Processes

Depending on the shapes of the coronoid processes, they were classified into three types: (1) Hook shaped, (2) triangular, and (3) rounded [Table 1 and Figures 1-3]. The hook-shaped coronoid process (type 1) had a tip which was pointing backward. This was present in 56 (27.4%) sides. In 23 mandibles (46 sides), it was present bilaterally, while in 10 mandibles (four right and six left), it was present unilaterally. Of the four mandibles which had a hook-like coronoid process on the right side, two were associated with a triangular coronoid process on the left side and two were associated with a rounded coronoid process on the left side. Of the six mandibles which had a hook-like coronoid process on the left side, two were associated with a triangular coronoid process on the right side and four with a rounded coronoid process on the right side. The type 3

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coronoid process had a rounded tip and was present in 49 (23.6%) sides. In 17 mandibles (34 sides), the rounded coronoid process was present bilaterally, and in 15 mandibles (six right and nine left), it was present unilaterally. Of the six mandibles which had a rounded coronoid process on the right side, two were associated with a hook-shaped coronoid process on the left side and four were associated with a triangular coronoid process on the left side. Of the nine mandibles which had a rounded coronoid process on the left side, two were associated with a hook-shaped coronoid process on the right side and seven were associated with a triangular coronoid process on the right side.

**Distribution of various types in male and female mandibles**

The distribution and incidence of the various types of coronoid process were noted in male and female mandibles [Table 2]. Of the 134 sides of mandibles belonging to males, the hook-shaped type was found in 41 (30%), triangular in 61 (46.5%), and rounded in 31 (23.5%). Of the 114 sides of the mandibles of females, the hook-shaped type was found in 15 (22.8%), triangular in 40 (53.5%), and rounded in 17 (23.6%).

**DISCUSSION**

The coronoid process, which has been defined as one of the bony process of the ramus of mandible where coronoid means hooked projection of bone. Field et al., 1947,[1] Williams et al. (1995) described the coronoid process as a flat triangular process. Coronal processes that are triangular in shape have been illustrated by Hamilton,[2] Romanes,[3] Snell,[4] and Basmajian and Slonecker.[5] Schafer and Thane[6] described the coronoid process as beak shaped. In this study, in 79.6% mandibles, the type of coronoid process was the same bilaterally and only in 20.4% mandibles did the presentation differ between sides.

The triangular and rounded types were the most and the least prevalent in males (46.5% and 23.5%, respectively), while in females, the triangular- and hook-shaped types were the most and the least prevalent (53.5% and 22.8%, respectively).

The knowledge about the morphological shapes of the coronoid process is useful for the maxillofacial surgeon. The coronoid process is considered to be one of the best donor graft sites for reconstruction of orbital floor deformities, Clauser et al.[7] Mintz et al.[8] reported the use of a temporalis myofascial flap both as a single and as composite flap with cranial bone, coronoid process, or skin island in all aspects of reconstructive craniomaxillofacial surgery including
trauma, deformities, tumors, temporomandibular joint ankylosis, and facial paralysis.

REFERENCES


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Table 2: Distribution and incidence (in parentheses) of the coronoid process in males and females, bilateral or unilateral (206 sides)

<table>
<thead>
<tr>
<th>Type</th>
<th>Male (134 sides)</th>
<th>Female (72 sides)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bilateral</td>
<td>Unilateral</td>
</tr>
<tr>
<td>(n=56)</td>
<td>33</td>
<td>8</td>
</tr>
<tr>
<td>Triangular</td>
<td>24</td>
<td>6</td>
</tr>
<tr>
<td>(n=101)</td>
<td>51</td>
<td>10</td>
</tr>
<tr>
<td>Rounded</td>
<td>39</td>
<td>7.5</td>
</tr>
<tr>
<td>(n=49)</td>
<td>23</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>107</td>
<td>27</td>
</tr>
<tr>
<td>(n=206)</td>
<td>81</td>
<td>19</td>
</tr>
</tbody>
</table>

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