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Bilateral Elongated Coronoid Process: A Case Report

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Abstract: *The mandible serves as an important structure in relation to mastication as all the muscles of mastication are attached to it. During the routine osteology classes of undergraduate students in SCB Medical College, Cuttack we found an adult male mandible having an elongated coronoid process on both sides. The length of the coronoid process was taken from the line tangential to the deepest part of mandibular notch to the apex which measured 2.8 cm on the right and 2.5 cm on the left side. Coronoid process develops in the temporalis muscle anlage and subsequently gets attached to the main part of mandible. Its shape acts as an evolutionary marker showing variation in relation to age, sex and race. The aim of this report is to discuss and highlight the etiology, embryology and various clinical implications of elongated coronoid process.*
Key words: *elongated, mandible, coronoid hyperplasia*

I. Introduction:

The mandible (from Latin 'mandere', to chew) or the jaw bone is the largest, strongest and lowest bone in the face [1]. It is also known as the inferior maxillary bone or the submaxilla. It is a 'U' shaped bone forming the lower jaw, articulating with temporal bone on either side. The parts of a mandible include: the body or base; the two rami; alveolar process; two condyles and two coronoid processes.

The mandible's coronoid process (from Greek Korone, 'like a crown' or 'resembling the beak of a crow') is a thin, triangular eminence which is flattened from side to side and varies in shape and size. Coronoid process is also present in the ulna which lodges in the 'coronoid fossa' of the humerus. Separate coronoid bones are present in lower animals which articulate with the splenial, angular, suprangular, articular, prearticular bones etc., to form a common 'dentary' bone which is homologous to the mandible in humans.

Abnormal elongation of the coronoid process, formed of histologically normal bone [2] but without any synovial tissue around it, is suggestive of coronoid hyperplasia because a normal mobile joint is usually surrounded by synovial tissue. The elongated coronoid process of the mandible leads to a gradually progressive but painless difficulty in opening the mouth. This may be due to the contact of coronoid process with the temporal surface of the zygomatic bone or medial surface of the zygomatic arch.

II. Case Report:

During our routine undergraduate teaching classes, a mandible was found to have bilaterally elongated coronoid process. On examination, was found to be that of an adult male. Points in favour of the age and sex were: 1) the base was quandrangular. 2) angle of the mandible was obtuse and everted. 3) mandible was robust with well marked muscular impressions. 4) the presence of the third molar.

The length of the coronoid process was taken from the line tangential to the deepest part of mandibular notch to the apex which measured 2.8 cm on the right and 2.5 cm on the left side. Rest of the mandible was normal and did not show any unusual feature.

Fig. 1: Posterior view of the mandible showing elongated coronoid processes

Fig. 2: Lateral view of the mandible showing elongated coronoid processes

Fig. 3: Anterior view of the mandible showing elongated coronoid processes

III. Discussion:

At birth, the mandible consists of two pieces connected by fibrous tissue at the symphysis menti but by the end of the first year, it becomes one bone. The coronoid process projects at a higher level than the condylar process. Gradually, there is absorption of bone along the anterior border and deposition of bone along the posterior border of ramus. In adults, the condylar process is placed at a higher level than the coronoid process.

Von Langenbeckin in 1853 first described about the elongation of the coronoid process of the mandible [3]. Jacob in 1899, described about the synovial joint formation between an elongated coronoid process and the ipsilateral zygomatic bone [3]. The height and position of the coronoid process of the mandible in relation to the condylar process are variable at birth, in adults and in old age. Thus, it can be used in crude estimation of age.

There are multiple theories as the cause of long coronoid process, some of which include temporalis hyperactivity, dysfunction of the temporo-mandibular joint caused by chronic disc displacement, hormonal stimulus and genetic inheritance [4]. Ankylosing spondylosis has also been said to be the cause of mandibular elongation (Bechterew disease) [5].

Unilateral coronoid hyperplasia is usually associated with facial asymmetry. It can be due to a trauma or a pathologic condition and is usually seen in women. Some say that the enlargement of the coronoid process is just a hyperplastic process while some others consider it to be histologic chondromatous or neoplastic changes most similar to ostechondroma.

Impingement of the enlarged coronoid processes against the medial surfaces of the zygomatic arches and posterior surfaces of the body of the zygomatic bones results in mechanical restriction of the mouth opening [6] and sometimes facial asymmetry. Thus, protrusion and lateral excursion may also be affected. The onset is generally at puberty and then progresses with age with male to female ratio being 5:1 [6]. Hence, the coronoid process has clinical significance to the maxillofacial surgeons for reconstructive purposes. Its size, shape, easy accessibility, immunocompatibility, appropriate hardness, slow resorption rate, early post operative recovery and less donor site morbidity makes it an ideal donor graft site for orbital floor deformities [7] and paranasal augmentation [8]. Fracture of the coronoid process is rare and usually requires no treatment unless impingement on the zygomatic arch is present.

The chief complaint of the patient with coronoid enlargement is limitation of mouth opening. The patient should be asked about the onset of the symptoms and progression of pain (if any) and other subjective symptoms. Computed tomography (CT) is the best method for a correct differential diagnosis in the case of coronoid hyperplasia. CT accurately detects coronoid process volume and its morphology thus allowing surgical planning. Treatment is Coronoidectomy for which several approaches are advised by different authors such as

intraoral, submandibular and coronal approach. Early post-operative rehabilitation should be done with proper physiotherapeutic techniques.

IV. Conclusion:

Coronoid process hyperplasia is a very rare cause of mandibular hypomobility. So, it is usually underdiagnosed, but a thorough background anatomical knowledge can help in examining the patient clinically and radiologically. This ultimately will help in the line of management and a better clinical outcome.

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