

**DISCLOSING THE CONCEAL OF INVISIBILITY – A RARE CASE REPORT OF MORPHOLOGICAL VARIANT OF TEMPORO- MANDIBULAR JOINT**

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Article Received on 29/08/2018

Article Revised on 19/09/2018

Article Accepted on 10/10/2018

ABSTRACT

The Temporomandibular joint [TMJ] is the finest engineering of articulation in human body, working bilaterally and synchronously connecting cranium to the mandible facilitating open, close, gliding and hinge type of movement referred as Ginglymoarthrodial joint [or] craniomandibular articulation. The morphological development of the TMJ during prenatal life lags behind other joints in terms of both the timing of its formation and its development within the entire bony component. The condyle growth is very unique as it provides baseline for mandibular growth. In some individuals there is alteration in size & shape of condyle, due to congenital or trauma or local cause origin may affect morphology of the condyle causing loss functions of TMJ. These variations in the shape and size of condyle should be an important factor in diagnosis of TMJ disorders. The manifestation of developmental condylar malformation with normal functioning TMJ is rare and has not been documented in the literature. Hence we describe a unique case of morphological variations of the condyle as a contribution of rarities of TMJ structural variations. **Background:** One of the most important and unique joints in the body is the Temporomandibular Joint [TMJ]. It is a complex ginglymoarthrodial joint which work bilaterally and synchronously to perform essential functions like opening, closing of mouth and mastication to provide stability of mandibular position from dislocation from its functional position. The condylar shapes are categorized into five basic types: flattened, convex, angled, and rounded and concave.⁽¹⁾ Morphologic changes of condyle occur due to developmental variations, remodeling, trauma, endocrine disturbances, and malocclusion and radiation therapy. **Methods:** Diagnostic Observation. **Conclusions:** The variability in the shapes and sizes of condyle should be an important factor in diagnosing the disorders of temporomandibular joint.

KEYWORDS: Temporomandibular joint, condylar malformation, trauma, Orthopantomogram, Cone beam computed tomography.

INTRODUCTION

One of the most important and unique joints in the body is the Temporomandibular Joint [TMJ]. It is a complex ginglymoarthrodial joint which work bilaterally and synchronously to perform essential functions like opening, closing of mouth and mastication to provide stability of mandibular position from dislocation from its functional position. The condylar shapes are categorized into five basic types: flattened, convex, angled, and rounded and concave.⁽¹⁾ Morphologic changes of condyle occur due to developmental variations, remodeling, trauma, endocrine disturbances, and malocclusion and radiation therapy. Developmental disturbances involving the TMJ may occur in utero late in the first trimester, may result in anomalies in the size and shape of the

condyle. Such variation may occur on the basis of simple developmental variability as well as remodeling of condyle to accommodate developmental variations, after birth as with age advancement or may due to local factors like malocclusion, trauma and diseases result in anomalies in the size and shape of the condyle. So anatomical disturbance in condylar architecture lead to altered neuromuscular balance of TMJ, such alteration creates TMJ dysfunction [TMD] with progression of age. The expression of developmental condylar malformation is rare and has not been reported previously in the literature, as it is difficult to detect variations of the condyle clinically, which is purely incidental finding during routine radiographic investigation, and most of the instances, individual got adopted to the variation in

condyle and remains asymptomatic. It may occur as a developmental anomaly or due to trauma. Here, we report a unique case of morphological developmental abnormality of the condyle, asymptomatic to the patient and functionally normal which was an accidental finding during diagnostic imaging procedure.

CASE DESCRIPTION

A 55-year-old female reported to the outpatient department of Vishnu dental college, Bhimavaram With a chief complaint of swelling over the left lower border of the cheek and difficulty in mouth opening for the past 15 days. On exploring the history, she gave a history of trauma, a road traffic accident where she was fallen from the bike and became unconscious and during that incident there was a hit on left side of the Jaw, while impact on ground, and had a laceration over the face, then she was admitted into nearby hospital, where first aid was provided since then complain of difficulty in mouth opening and pain in left TMJ region. Her past medical and surgical history was noncontributory. On clinical examination, there was tenderness over left TMJ region with difficulty in mouth opening, on intraoral examination revealed multiple missing teeth and root stumps were present. Examination of TMJ revealed deviations, and no clicking, crepitus, during jaw movements. To rule out the fractures and for further evaluation orthopantomograph [OPG] was taken. OPG revealed no evidence of fracture lines over condyles and other parts of mandible but morphological variation of the right condyle head was noticed with narrowing of neck of condyle and altered shape of condylar head in the form of beak, giving an appearance of bird beak shape and reduced joint space in the left TMJ [Figure 2], further to rule out any abnormality in the position of condyle on open and closed view of TMJ Tomogram was advised, it revealed reduction in joint space in the left and right condyle in both open and closed view and in case of right condyle variation shape of condyle was noticed giving a appearance of bird beak shaped with saucerization, where as condylar head is within the glenoid fossa for right in open view, but in case of left condyle in open view the condylar tip was not close to the tip of the articular eminence i.e. posterior to the articular eminence compared to right side of the condyle in open view [Figure :3]. As conventional techniques are

inadequate for TMJ imaging because of anatomic complexity of this region, for further precise evaluation, a three dimensional CBCT imaging was advised.

Cone-beam computed tomography [CBCT] was taken to the TMJ of both right and left side to analyze the variation. The 3D reconstructed image of right condyle in coronal section of the condyle shows a thinning of cortical plate on superior- lateral aspect and with sclerosis in medial aspect of the condyle and erosion in superior-lateral aspect and reduced joint space and with narrowing of condylar neck, whereas shape of the condyle is bird beak in shape in sagittal section and 3D reconstructed image [Figure: 4, 6]. The sagittal section of left condyle and 3D constructed image of left condyle revealed erosion of anterior -posterior part of condyle with thinning of cortical plate and reduced joint space with abnormal shape of condyle i.e. Triangular shape and presence of hypodense area over the superior border of condyle within the joint space giving a impression of pseudocyst[Figure:5]. Based on clinical and radiological findings a provisional diagnosis of rare developmental anatomical variant of right condyle of the TMJ and with pseudocyst in relation to left condyle. Patient was advised to medication with NSAIDS & muscle relaxant twice daily for three days and advised to be on soft diet and recalled after 3days. The patient reported with reduced swelling, pain and able to open the mouth opening was increased and no discomfort on wide opening.



Figure 1: Patient profile.



Figure 2: Orthopantomograph.

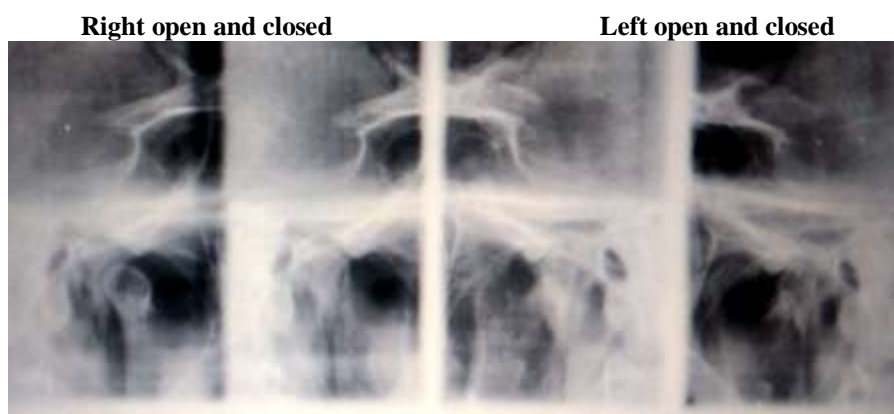
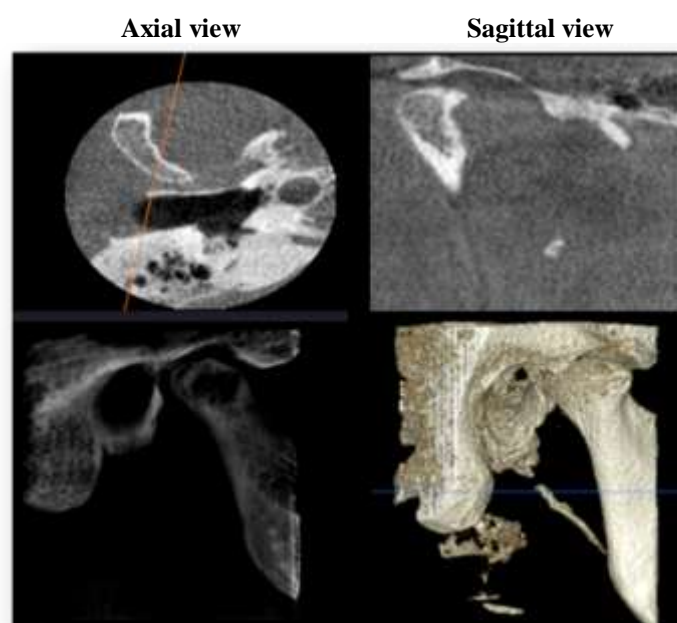
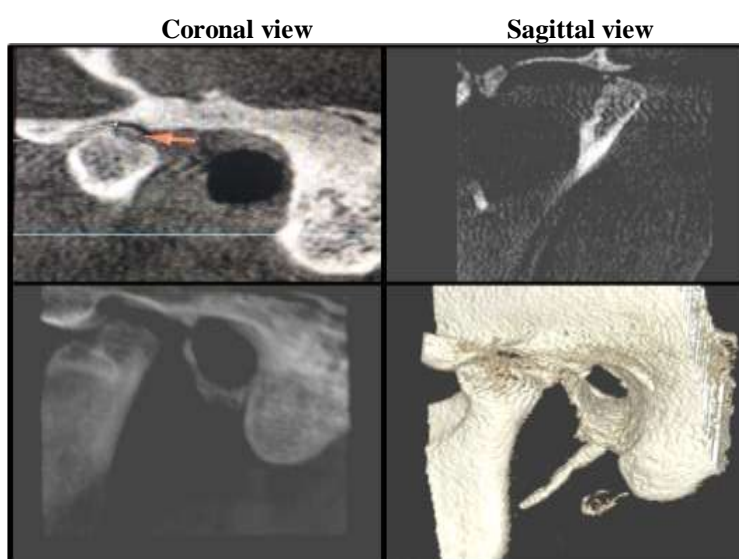


Figure 3: TMJ open and closed views.



Panoramic view 3D reconstructed view.
Figure 4: Axial, sagittal, panoramic and 3D reconstructed view of right TMJ.



Panoramic view 3D reconstructed view
Figure 5: Coronal, sagittal, panoramic and 3D reconstructed view of left TMJ.

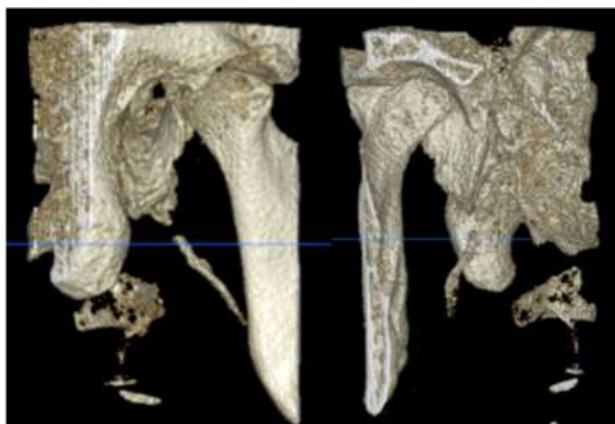


Figure 6: 3D reconstructed images of CBCT –Right condyle.



Figure 7: 3D reconstructed images of CBCT –Left condyle.

DISCUSSION

The human condyle is basic components of TMJ, having a convex configuration throughout when viewed the condyle is roughly ovoid in outline. It is 15 to 20 mm Medio- lateral dimension and 8 to 10 mm Antero-posterior. Human mandibular condyle may be categorized into five basic types: flattened, convex, angled, rounded and concave. The appearance of mandibular condyle varies greatly among different age groups and individuals, which are influenced by a variety of factors which can result in morphological diversity and variations in shape.

At birth, the joint is still largely underdeveloped. There are many causes of the various growth disturbances and abnormalities of the mandibular condyle and related structures. Growth disturbances in the development of the mandibular condyle may occur in utero late in the first trimester and may result in disorders such as aplasia or hypoplasia of the mandibular condyle. Meanwhile, hyperplasia of the mandibular condyle is not visible at birth and seems to be gradually acquired during growth. Morphologic changes may occur due to developmental disturbances, and other local factors include malocclusion, trauma and a normal variation of the condylar morphology occurs with age, gender, facial

type, occlusal force, functional load between right and left sides of the jaw.

In 1961, **Yale et al.**^[2] was the first one to report about the different shapes of mandibular condyle. Initially, **Yale et al.**^[3] classified condylar into four categories namely convex, flattened, angled and rounded other classification given by **Ejima et al.**^[4] where the condyle were classified as “convex,” “round,” “flat,” “angled”. The shape of the condyle seen in the present case belongs to angled type of condyle according classification given by **Yale**^[3], **Ejima et al.**^[4]

Majority of the cases is detected during routine radiographic examination. In most of the cases, patients have no symptoms. In the present case patient had symptoms of tenderness, restricted mouth opening due to trauma, but on radiographic examination incidentally we found an abnormality in the shape of the condyle, this is only accidental finding in the present case. Among various imaging modalities used for TMJ imaging, panoramic radiographs still remains the main screening modality for TMJ abnormalities. CT, CBCT images are highly accurate for assessing osseous abnormality in TMJ. However, developmental variations of condylar head can also be seen on OPG, but sometimes the overlapping of the anatomic structures of TMJ due to its three-dimensional complexity, changes cannot be evaluated accurately by OPG. Currently, CBCT is the imaging modality of choice to investigate bone alterations of the TMJ in dentistry, since it is possible to obtain sections of this structure on several levels. Accordingly, the morphology of the osseous joint components, cortical bone integrity, and subcortical bone changes can be viewed using CBCT. In the present case there is saucerization of condylar head and with bird beak shaped of right condyle in CBCT images which is rare to found in accordance with study carried by **Vahanwala et al.**^[5] where he stated that crooked shaped condyle shape is rare to found, and seen around 9% of populations in sagittal section and also flattening of condylar head.

Several studies have attempted to evaluate the morphology and position of the condyle but not much emphasis has been laid on the shape of the condyle. In the present case the abnormal shape of the condyle identified incidentally may be due to developmental defect which got aided with the trauma may leave us in a confusion whether the abnormality may be due to trauma, and to rule out the dilemma, history provided by the patient was taken into consideration which revealed a short duration, in such scenario trauma may not be a reason for morphological variation of condyle, so the variation in condyle head may be due to developmental defect which was diagnosed radiographically.

The developmental variations of condylar head seen in the present case, is an anatomic variation of condyle with aided age changes like erosion, flattening, sclerosis and

rare entity of pseudocyst all together in one condyle is a rare anomaly to found.

CONCLUSION

Morphological variation may not always shows signs/symptoms, as they are developmental in origin patient may adopt changes to formulate function of TMJ normally, but those should be considered particularly because any pathology affecting those individuals in lifetime may affect the TMJ, in such scenario pathology should be treated. The diagnosis of a morphological variations condyle usually relies on radiological findings rather than clinical findings. Hence, dental professional should have a thorough knowledge of temporomandibular joint anatomy, condylar variations and neurophysiology of joint can guide clinician in fabrication of proper preventive and curative measures for patients with temporomandibular joint problem. Thus variability in the shapes and sizes of condyle should be an important factor in diagnosing the disorders of temporomandibular joint.

ACKNOWLEDGMENTS

I would like to thank each and every teachers of my Department for they continuous support.

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