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Case Report

Osteochondroma of the temporomandibular joint: Condylectomy and “Swing-back” of the mandible

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ABSTRACT

Osteochondroma (OC) is a common long bone tumor, which rarely affects the cranio-maxillofacial region. They present with cartilage-capped bony protuberances that present themselves on the external bony surface, with asymmetry of face and malocclusion being their most common presentations. There is no definite protocol for its management, although treatment is directed towards the rectification of the facial asymmetry to provide pleasant esthetics and functional occlusion. It is usually managed by the surgical removal of the tumor i.e condylectomy, and second stage orthognathic surgery if required. We hereby represent two OC cases with the aim to revisit the long known concept of “swing-back” of mandible post condylectomy, which was performed along with mandibular lower border shaving, thus proving it to be an effective management option in patients not willing for later gnathic surgeries, as mandible attains near-normal position along with adequate function with such single-stage management.

Key Message : Osteochondroma (OC) rarely affects the cranio-maxillofacial region, with condyle and the coronoid process being the most affected facial bones. There is still uncertainty about its pathogenesis and etiology, hence a definitive diagnosis should be made after a combined clinical and radiological examination.

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1. Introduction

Osteochondroma (OC) is a common slow growing and long bone benign tumor, rarely affecting the bones in the cranio-maxillofacial region. It usually affects the condyle and coronoid process among the facial bones.¹ It is an osteophytic bony outgrowth which comprises of both the cortical and medullary portions, and has an overlying hyaline cartilage cap. Gradual enlargement of the head of the mandibular condyle results in facial deformity, malocclusion and temporomandibular joint (TMJ) dysfunction. It occurs after puberty and mainly affects the female gender.² There is still uncertainty about its pathogenesis and etiology, hence a definitive

diagnosis should be made after a combined clinical and radiological examination. It is usually managed by the surgical removal of the tumor i.e condylectomy, and second stage orthognathic surgery if required. Usually such cases are overlooked as TMJ dysfunction. Hence, the recognition of the problem is very important for its well-timed treatment, thus preventing the worsening of the condition and improving the patient's quality of life. This case report aims to represent two such cases, so as to help us revisit the long known concept of “swing-back” of mandible post condylectomy, thus restoring aesthetics and functional occlusion on follow-up.

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2. Case History

2.1. Case 1

A 24-year-old male presented to our department with the complaint of deviation of chin to the right side and difficulty in chewing from left side since 9 years. He also complained of progressive elongation of the left facial side. There was no significant family or medical history, with no history of trauma or local infection or inflammation. On clinical examination face was grossly asymmetrical with vertically elongated left facial side, and deviation of the chin towards the right side by 5 mm, along with bowing of left lower border of the mandible (Figure 1a). Intra-orally, deep bite was evident with open bite wrt left side, with occlusal cant downwards towards the left side (Figure 1b). OPG and computed tomography (CT) of the face showed osseous outgrowth of the left mandibular condyle antero-medially, along with vertically elongated left mandible (Figure 1c-d). Tc-99m MDP bone scintigraphy was done which showed increased osteoblastic activity with respect to left condylar head (Figure 1e).

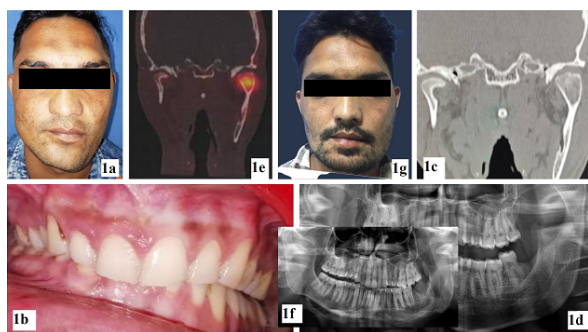


Fig. 1: g): a) Depicts asymmetrical with vertically elongated left facial side, and deviation of the chin towards the right side, along with bowing of left lower border of the mandible; b) Evident deep bite with open bite wrt left side, along with occlusal cant downwards towards the left side; c-d) Orthopantomogram and computed tomography (CT) of the face showed osseous outgrowth of the left mandibular condyle antero-medially, along with vertically elongated left mandible; e) Tc-99m MDP bone scintigraphy shows increased osteoblastic activity with respect to left condylar head; f) Post-operative OPG shows left TMJ condylectomy along with shaving of lower border of mandible; g) Follow up picture depicting swing-back of the mandible to left side, leading to the correction of facial symmetry and dental midline.

Left TMJ condylectomy was performed through pre-auricular approach along with shaving of the lower border of mandible through an intraoral vestibular approach as seen in post-operative OPG (Figure 1f). Post-operatively swing-back of the mandible was observed to left side with time, leading to the correction of facial symmetry and dental midline, along with satisfactory and functional occlusion (Figure 1g).

2.2. Case 2

A 25-year-old male presented to us with a similar complaint as above, with enlarged left side of face since 5 years. There was no relevant medical or family history. On examination, it was seen that there was vertical enlargement of the left mandible along with bowing of the left lower border of the mandible (Figure 2a). Chin deviation was towards the right by 7 mm. Intra-orally, dental midline was shifted to right by 5 mm, with reverse overjet of 2 mm was observed from 31 to 44 region (Figure 2b). Bilateral TMJ was non-tender. Orthopantomogram (OPG) revealed bulbous left condyle with medial outgrowth, which led to the provisional diagnosis of TMJ osteochondroma (Figure 2c). He was managed similarly above with left TMJ condylectomy, along with shaving of the left lower mandibular border (Figure 2d). He had a significant improvement in the function and esthetic in his follow-up, as swing-back of the mandible was observed improving the facial symmetry and attaining positive overjet (Figure 2e-f).

The work has been carried out in accordance with the Code of the Ethics of the World Medical Association. Written and informed consent was obtained from the patient and the parents for the treatment and for the publication of the case and the images.

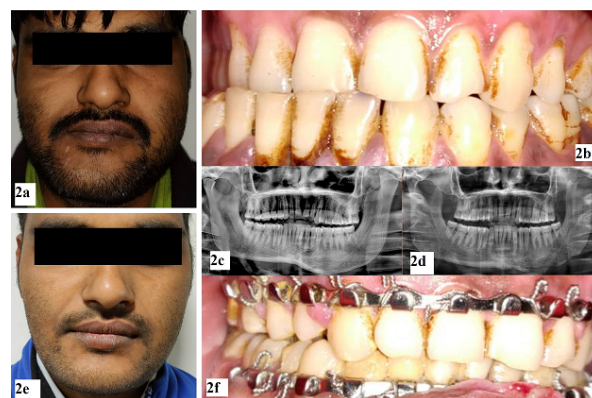


Fig. 2: f): a) Pre-operative patient picture depicting vertical enlargement of the left mandible along with bowing of the left lower border of the mandible; b) Deviation of chin to right side along with dental midline shift to the right side; c) Orthopantomogram (OPG) revealed bulbous left condyle with medial outgrowth; d) Post-operative OPG depicting left TMJ condylectomy, along with shaving of the left lower mandibular border; e-f) swing back of the mandible was observed improving the facial symmetry and attaining positive overjet

3. Discussion

Osteochondroma, also known as osteo-cartilaginous exostosis are rare cartilage-capped bony protuberances that present themselves on the external bony surface. It is considered a developmental lesion and not a

true neoplasm.² Wolford et al. classify it as Condylar Hyperplasia (CH) type 2, with further subtypes as A and B depending upon whether exophytic tumor growth is present or not.³ It commonly occurs in the axial skeleton but rarely involves maxillofacial bones, like the zygoma, maxillary sinus, skull base, glenoid fossa and mandible; with condyle and coronoid processes as the most common involved areas, with a broad age-range of 13 to 70 years.¹⁻⁴

Numerous theories have been put forward regarding its pathogenesis including developmental, neoplastic or reparative, with trauma, surgery and irradiation as other contributing factors, but none of them are proven.² They are considered to originate from the muscular tendon attachments of lateral pterygoid, alike long bones, where constant stress and strain causes hyperplasia of the cells.⁴ Porter et al. have suggested mutation in chromosome 8 and 11 to be the possible genetic cause.⁵ Diagnosis should be established on a combined evaluation of the patient's history, clinical and radiological findings. Clinically, vertical elongation of the face on the affected side is observed causing facial asymmetry, malocclusion with cross-bite on the opposite side and open bite on the affected side, prognathic or deviated chin, and TMJ dysfunctional pain in rare instances. Plain radiographs such as OPG is enough for the diagnosis of osteochondroma, but CT and magnetic resonance imaging (MRI) can be done to see the extent in case of large tumors, and for evaluation of possible proximity to vascular structures or to determine the cartilage cap thickness respectively. Zhang et al has even described varied radiographic appearance of osteochondroma on OPG, with antero-medial extension being the most common as shown in our cases.⁶ Bone scan/ scintigraphy can be done to provide additional information by confirmation of the increased uptake of radiotracer in the condyle. Whole body single photon emission CT can be done to rule out osteochondromas in the skeleton if suspected. The differential diagnosis includes unilateral condylar hyperplasia, osteoma, chondroblastoma, chondroma and benign osteoblastoma.²

There is no definite protocol for its management, although treatment is directed towards the rectification of the facial asymmetry to provide pleasant esthetics and functional occlusion. Tumor causing only vertical elongation, showing mainly superior or superior-medial overgrowth, requires condylectomy with disc repositioning; whereas those associated with bowing of mandible, might require orthognathic surgeries at a later stage.⁴ However, the need for orthognathic surgeries can be reduced if minimal mandibular lower border shaving can be attempted at the initial stage of condylectomy as has been represented in our cases. An additional option is ramus osteotomy and superior positioning of the posterior ramus to form a neocondyle with satisfactory TMJ function while avoiding the resection site deformity.^{7,8} A simultaneous joint reconstruction is recommended owing to the benign nature of the lesion,

low rate of recurrence and the need for the maintenance of ramus height. Autogenous bone grafts including the costochondral or sternoclavicular grafts have also been used for the reconstruction but disadvantages include donor site morbidity, dual exploration sites and also resorption of the graft.⁹ Total joint prosthesis can be a substitute when the tumor involves both the condyle and the fossa.¹⁰

4. Conclusion

To conclude, diagnosis and the management of OC has been a diagnostic dilemma. Its treatment should depend upon its growth direction and size of the tumor. Condylectomy along with mandibular lower border shaving can prove to be an effective management option in patients not willing for later gnathic surgeries, as mandible attains near-normal position in most of the cases.

5. Source of Funding

None.

6. Conflict of Interest

None.

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