J. Maxillofac. Oral Surg.
https://doi.org/10.1007/s12663-021-01618-w

CASE REPORT

Gigantiform Osteochondroma of Condyle: Report of a Rare Case and its Surgical Outcome

Venkatesh Anehosur[1] · Abhijit Joshi[1] · Akshay Byadgi[1] · Chaitra Shetty[1] · Anand K. Patil[2] · Jayanti Choudhary[2]

Received: 1 January 2021 / Accepted: 9 July 2021
© The Association of Oral and Maxillofacial Surgeons of India 2021

Introduction

Osteochondroma is one of the rare benign growing lesions arising from the surface of the bone [1]. These lesions are commonly seen in long bones and are rare in the craniofacial region [1]. The incidence in facial region is about 0.6% with mean patient peak age in fourth decade and male: female ratio of 1:1.2 [2]. Osteochondromas arising from condyle are more common due to associated development by endochondral ossification. A total of 90 cases of condylar osteochondromas are documented in the literature [1]. The present a rare case of a huge osteochondroma of left condyle leading to gross facial asymmetry and causing modification in treatment strategy.

✉ Venkatesh Anehosur
venkyrao12@yahoo.co.in

Abhijit Joshi
drabhi@gmail.com

Akshay Byadgi
akshay16ab@gmail.com

Chaitra Shetty
chaitrashetty2015@gmail.com

Anand K. Patil
akptimes7@gmail.com

Jayanti Choudhary
drjayanti0110@gmail.com

[1] Department of Oral and Maxillofacial Surgery, SDM Craniofacial Research Centre, SDM College of Dental Sciences & Hospital, A Constituent Unit of Shri. Dharmasthala Manjunatheshwar University, Dharwad, Karnataka 580009, India

[2] Dept. Orthodontics and Dentofacial Orthopaedics, SDM College of Dental Sciences & Hospital, A Constituent Unit of Shri. Dharmasthala Manjunatheshwar University, Dharwad, Karnataka 580009, India

Case Report

A 43-year-old male reported to Craniofacial centre with a complaint of progressive deviation of the mandible to the right since 3 years. History of injury to left side of face 3 years ago was elicited. Clinical evaluation revealed gross facial asymmetry with deviation of the mandible to the right side (Fig. 1). Range of lateral movements was restricted. Mouth opening was adequate with inter-incisal distance of 30 mm. Intraorally right posterior cross bite and reverse overjet of 6 mm was noted (Fig. 2). Maxillary occlusal plane was normal. OPG revealed irregular radiopaque mass over left condylar region. Other blood investigations of serum calcium, phosphorous, alkaline phosphatase were normal to rule out bone pathologies. CT scans of 1 mm sections showed an extensive hyperdense mass extending medial to the left condyle close to the jugular foramen with obliteration of the sigmoid notch (Figs. 3, 4). The DICOM data were exported to facilitate fabrication of a 3D printed model (Fig. 5).

Intended treatment was surgical excision of the mass via a pre-auricular Alkayat–Bramley approach and mandibular asymmetry correction by bilateral sagittal split osteotomy (BSSO). Pre-surgical orthodontic treatment was commenced 6 months pre-operative to align arch and remove any interferences. Pre-auricular Alkayat–Bramley approach was made, and skin subcutaneous layer flap was raised above the plane of temporalis fascia. The fascia was incised and dissection was performed below the fascia to raise and preserve the branches of facial nerve and reach the root of zygoma. Then, subperiosteal dissection was

Published online: 16 July 2021

Fig. 1 Pre-operative profile of the patient showing gross asymmetry with occlusal discrepancy

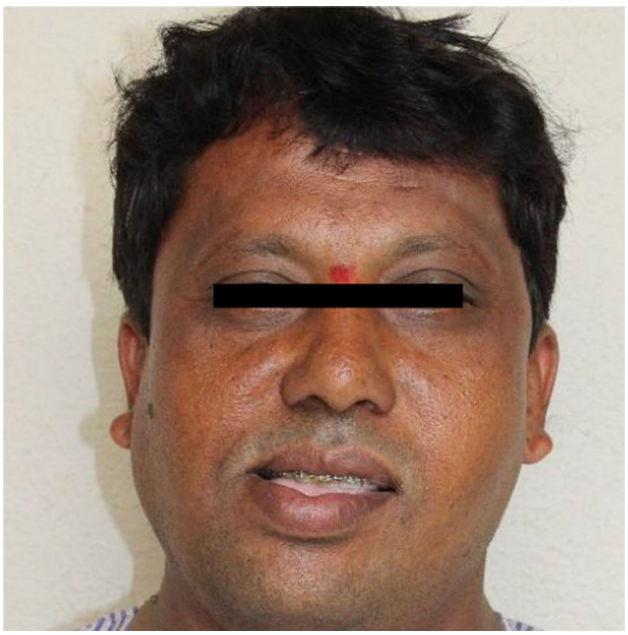


Fig. 2 Pre-operative profile showing deviation of mandible and pre-surgical orthodontics

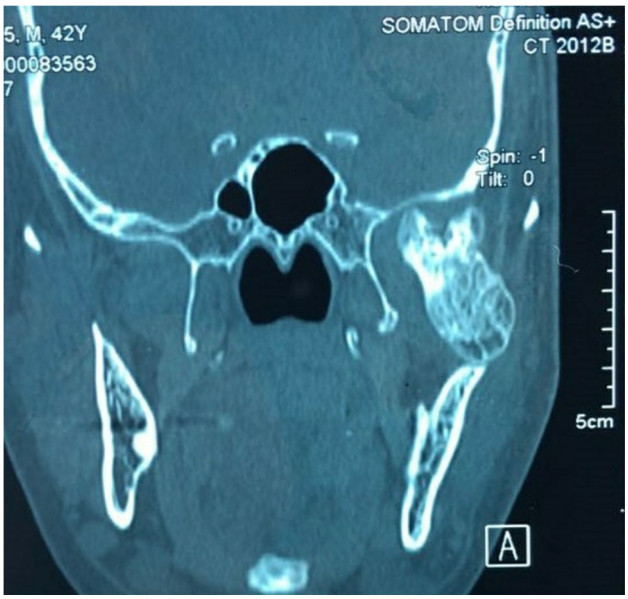


Fig. 3 CT Coronal section showing superior extension of lesion to skull base

carried out over the arch to expose the mass and its margins were identified (Fig. 6). The mass was osteotomised along the cleavage demarcation and delivered out in Toto (Fig. 7). Bleeding from surgical site was controlled and packed with haemostatic agent. Minivac drain was placed into the defect and secured. Intraoperative findings were surprising, as soon as the mass was excised, the mandibular deviation was self-corrected. BSSO was not performed. Post-operative orthodontics continued for six months. Follow-up of one year, there was no recurrence of pathology or any occlusal disturbances (Figs. 8, 9).

Gross examination of the specimen revealed grey cartilaginous areas with alteration in shape and size, cut surface showed cancellous bony trabeculae covered with hyaline cartilage (glossy areas) and firm to hard in consistency.

Microscopic examination revealed cartilage cap of varying thickness covered by a layer of periosteum (perichondrium). Hyaline cartilage cap has evenly distributed chondrocytes which have single small dark nucleus resting within the individual lacunae. The marrow was filled with fat without hematopoietic elements. Bone showed persistence of partially ossified and non-ossified hyaline cartilage within the centres of the trabeculae confirming the diagnosis of osteochondroma of condyle.

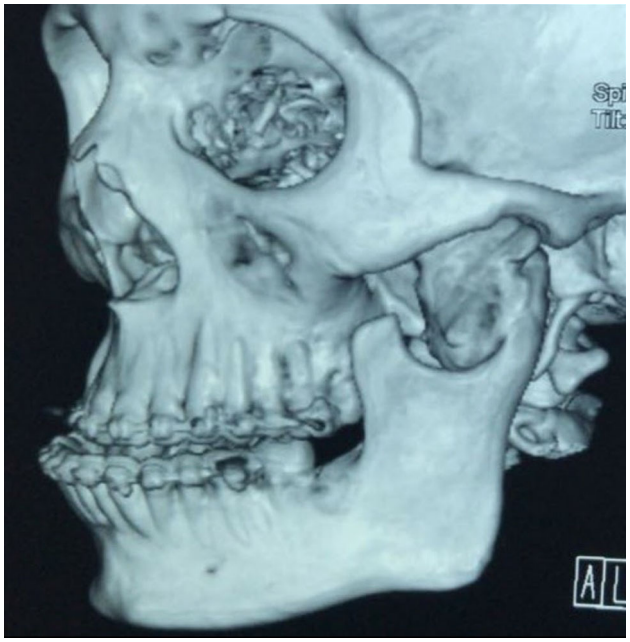


Fig. 4 CT 3D showing pathology obliterating the sigmoid notch

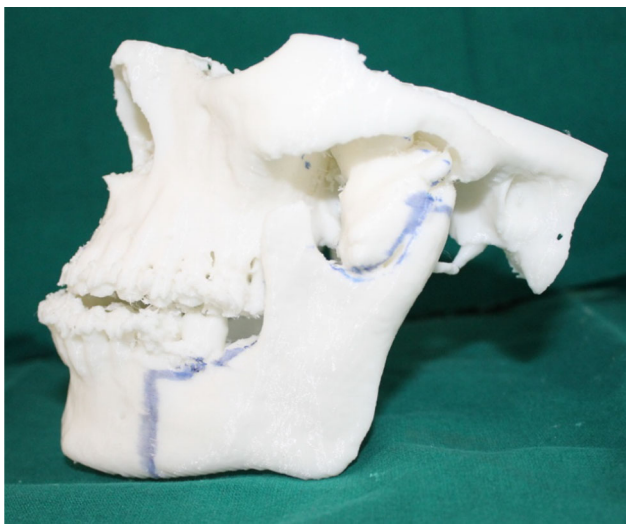


Fig. 5 3D print to assess the extent of pathology and treatment planning

Discussion

The World Health Organization defines the osteochondroma of condyle (OC) as a "cartilage-capped bony protrusion on the outer surface of bone". And it represents 35–50% of all benign bone tumours and 8–15% of all primary bone tumours [1]. The aetiology of osteochondroma is unclear. Trauma has been considered as one of the factors [3]. Reported patient had sustained injury to the left

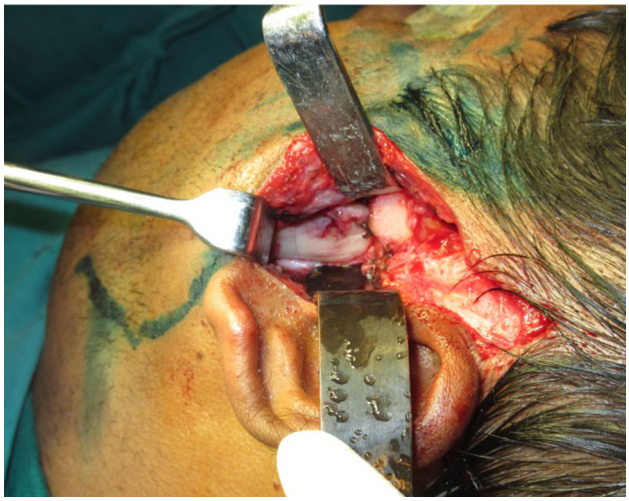
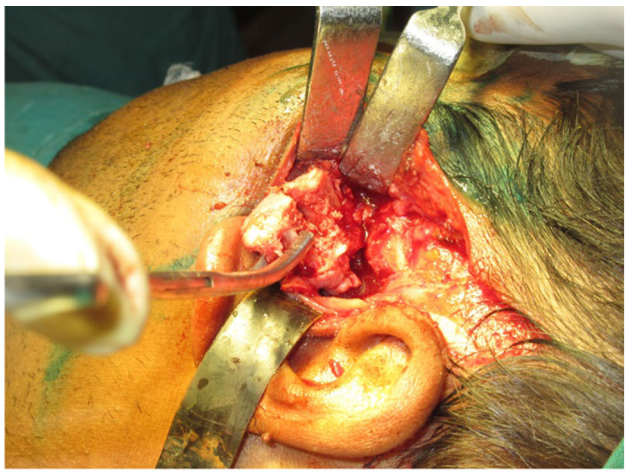


Fig. 6 Intraoperative exposure of the bony pathology



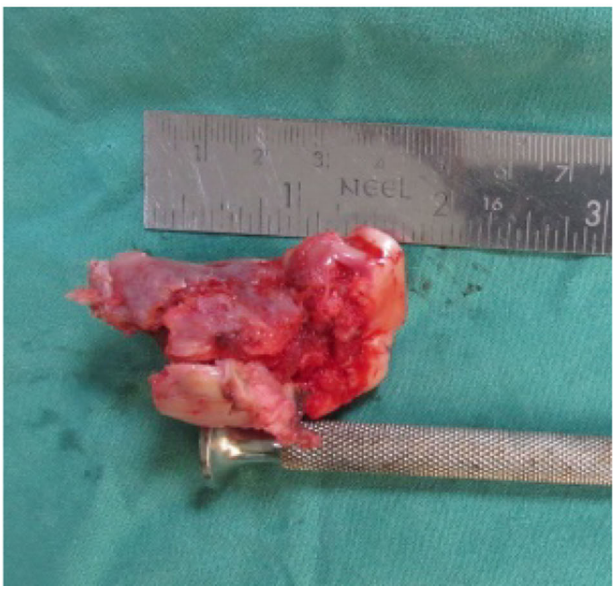


Fig. 7 Pathology delivered out in Toto

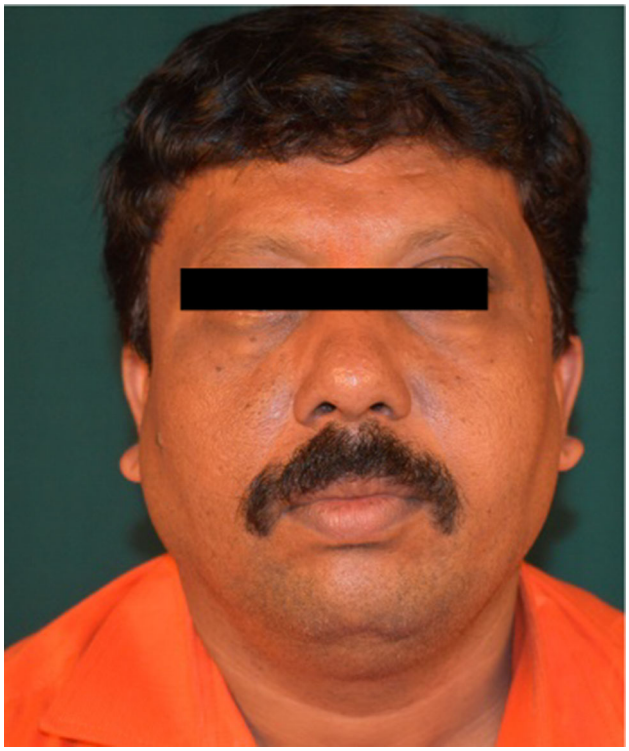


Fig. 8 One-year follow-up showing correction of facial asymmetry

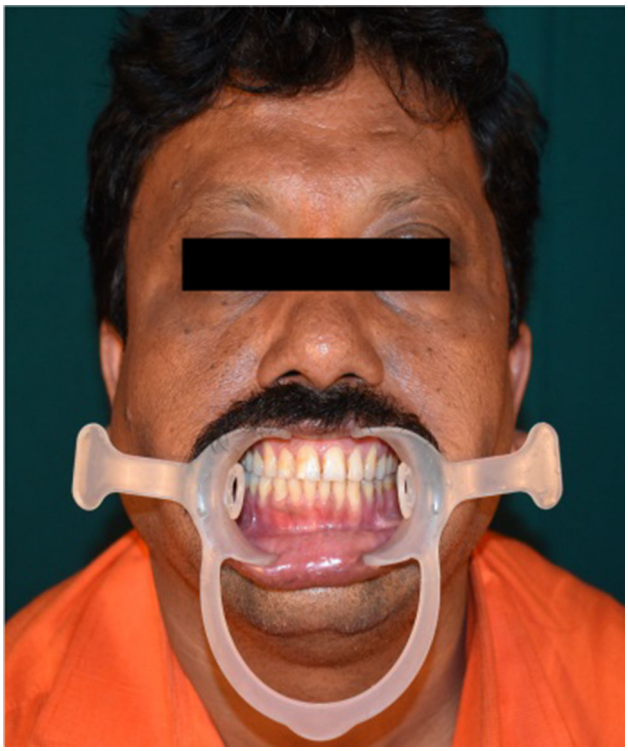


Fig. 9 Follow-up of one year showing good stable occlusion

pre-auricular region, leading to damage to the external surface of the condyle which would have stimulated reactionary periosteal activity leading to the mass [3]. Clinically, the common manifestations of the osteochondroma of condyle are well documented like facial asymmetry, deviation of mouth on opening, malocclusion, including ipsilateral posterior open bite and contralateral cross bite, pre-auricular swelling, TMJ pain, clicking sound, and recurrent joint dislocation [1]. Radiographic appearance in OPG for osteochondroma of the mandibular condyle can be pathognomonic, as in this case, irregularly shaped, mixed density (radiopaque and radiolucent), expansile lesion [1]. Bone scintigraphy and positron emission tomography play an important role in differentiating from condylar hyperplasia [10]. Condyle tumour is classified into two variants type 1 a protruding expansion with mean proliferation direction of mass in one way, and type 2 a globular expansion with mean mass proliferate in all directions. The case reported here is of type 2 variant with three-dimensional growth [5].

Treatment plan has been varied based on TMJ symptoms from subtotal condylectomy, low or high condylectomy, with combination of orthognathic surgery [5, 11, 12]. The role of costochondral graft and total joint prosthesis have also been reported. The need for zygomatic arch osteotomy with pre-auricular approach is described by Kumar [6] and Park et al. [7] but there is higher tendency for the facial nerve weakness. Irrespective of the conservative or total condylectomy, the role of corrective orthognathic surgery is based upon amount of mandibular swing and occlusion [8]. The new minimally non-invasive endoscopic-assisted intraoral procedure is reported [9]. Even though in our centre the endoscopic-assisted intraoral procedure is used for condylar fractures, the plan was for pre-auricular approach keeping in view of need for greater accessibility due to its skull base extension. Intraoperatively there were no complications except the fact the time taken to deliver the pathology in spite of good mobilization. It could be attributed irregular surface growth pattern in the sigmoid notch to skull base superiorly which necessitated careful manipulation. The surprise element was once the bleeding was controlled, upon checking the mandible and its position, there was good amount of swing which enabled mandible teeth to sit in near normal occlusion and there was obvious correction of facial symmetry to normal position which lead to take a call of abandoning the BSSO procedure intraoperatively.

The histological criteria for diagnosis of osteochondroma of condyle include cartilage cap of varying thickness covered by a layer of periosteum (perichondrium) with hyaline cartilage cap having evenly distributed chondrocytes which have single small dark nucleus resting within the individual lacunae [1]. Pre- and post-surgical orthodontic was done to overcome mild occlusal

discrepancy to obtain stable occlusion [4]. Previous studies osteochondroma of condyle to recur after surgery, so close follow-up for 1 year is advised.

Conclusion

Osteochondroma in the facial area is an uncommon disease. The location and extension as seen in this case to skull base poses cause challenge However, more cases have been reported and its treatment has been well established. Its growth state and the type of tumour are important to decide the plan. In the case of inactive type 1 osteochondroma, local excision alone can provide good results. In huge lesion with our case with gross asymmetry, local excision with post-operative orthodontics will suffice. Long-term follow-up is mandatory for recurrence and closed observation for altered in facial symmetry.

Acknowledgements Authors like to thank Dr Niranjan Kumar Vice Chancellor Shri. Dharmasthala Manjunatheshwara University and Dr Balram Naik, Principal SDM college of Dental sciences and Hospital for their support and encouragement.

Declarations

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Statement IRB approval obtained and the patient permission taken for publication.

References

1. Harish M, Manjunatha BS, Kumar AN, Alavi YA (2015) Osteochondroma (OC) of the condyle of left mandible: a rare case. J Clin Diagn Res JCDR 9(2): ZD15
2. Lim W, Weng LK, Tin GB (2014) Osteochondroma of the mandibular condyle: report of two surgical approaches. Ann Maxillofac Surg 4(2):215
3. Iizuka T, Schroth G, Laeng RH, Lädrach K (1996) Osteochondroma of the mandibular condyle: report of a case. J Oral Maxillofac Surg 54(4):495–501
4. Utumi ER, Pedron IG, Perrella A, Zambon CE, Ceccheti MM, Cavalcanti MG (2010) Osteochondroma of the temporomandibular joint: a case report. Braz Dent J 21(3):253–258
5. Chen MJ, Yang C, Qiu YT, Zhou Q, Huang D, Shi HM (2014) Osteochondroma of the mandibular condyle: a classification system based on computed tomographic appearances. J Craniofac Surg 25(5):1703–1706
6. Kumar VV (2010) Large osteochondroma of the mandibular condyle treated by condylectomy using a transzygomatic approach. Int J Oral Maxillofac Surg 39(2):188–191
7. Park SH, An JH, Han JJ, Jung S, Park HJ, Oh HK, Kook MS (2017) Surgical excision of osteochondroma on mandibular condyle via preauricular approach with zygomatic arch osteotomy. Maxillofac Plast Reconstr Surg 39(1):1–5
8. Roychoudhury A, Bhatt K, Yadav R, Bhutia O, Roychoudhury S (2011) Review of osteochondroma of mandibular condyle and report of a case series. J Oral Maxillofac Surg 69(11):2815–2823
9. Yu HB, Sun H, Li B, Zhao ZL, Zhang L, Shen SG, Wang XD (2013) Endoscope-assisted conservative condylectomy in the treatment of condylar osteochondroma through an intraoral approach. Int J Oral Maxillofac Surg 42(12):1582–1586
10. Appadurai R, Lingeshwar D, Shwetha V, Christina RD (2017) Bone scintigraphy as a diagnostic tool in condylar hyperplasia. J Oral Maxillofac Radiol 5(3):84
11. Wolford LM, Movahed R, Dhameja A, Allen WR (2014) Low condylectomy and orthognathic surgery to treat mandibular condylar osteochondroma: a retrospective review of 37 cases. J Oral Maxillofac Surg 72(9):1704–1728
12. Ord RA, Warburton G, Caccamese JF (2010) Osteochondroma of the condyle: review of 8 cases. Int J Oral Maxillofac Surg 39(6):523–528

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.