

Original article:

Unilateral mandibular condylar hyperplasia - Report of 2 cases and review of literature

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Abstract

Condylarhyperplasia (CH) is a progressive and pathologic overgrowth of one or both condyles, which may affect the neck, ramus, or body of the mandible causing asymmetry of the face, alteration of the dental occlusion with unilateral crossbite or open bite,articular dysfunction, speech, and masticatory problems.Constant clinical evaluation, serial radiographs, dental models and bone scan techniques can be employed to aid in diagnoses.Here in, we report 2 cases of unilateral CH.

Keywords –Condylarhyperplasia, Facial asymmetry, Dental malocclusion, Trismus, Trauma

Introduction

Condylar hyperplasia (CH) is an uncommon malformation of the mandible, caused by excessive growth of one of the condylar part of the mandible. Unilateral condylar hyperplasia is characterized by slow and progressive condylar enlargement and elongation of the mandibular neck resulting in facial asymmetry and shifting of the midline of the chin to the unaffected side 1. It occurs as an acceleration of growth in young patients that manifests at the same time of physiologic condylar growth or as an unpredictable growth spurt in adults 2. Aetiology is not well understood though various theories include neoplasia, trauma followed by excessive proliferation in repair, or a response to infection or to abnormal loading. Local circulatory

and endocrine disturbances have also been suggested^{3, 4, 5}. Though there is no pain associated with the affected joint, facial asymmetry and malocclusion are noted. CH affects not only the growth of the affected bone structure, but also the soft tissues of the sector including ligaments, muscles and bone structures related to this mandibular position are affected which determines the severity of facial asymmetry⁶. Detailed history, facial analysis, clinical and radiographic examinations are essential to diagnose this condition. Treatment is primarily surgical with or without orthodontics, and depends on degree of severity and condylar growth status.

Case 1: A 23 yr. old male patient reported with inability to open his mouth completely since two months. History revealed nasal bone fracture following trauma (road traffic accident) a year back for which he underwent closed reduction under General Anaesthesia. Since two months the patient is experiencing discomfort and jerky movements in relation to (right) TMJ on opening his mouth. Patient also gives history of orthodontic treatment 5 years back. On extra oral examination no gross

facial asymmetry was noticed. Intra oral examination revealed deviation of chin to right side (Fig 1), and mouth opening was reduced to 28mm. On palpation there was tenderness on the right TMJ. Radiographic examination and CBCT scan revealed elongated right mandibular condyle compared to the left side suggestive of unilateral condylar hyperplasia (Fig 2,3,4).



Fig 1-Showing deviation of chin to right side

Fig 2-Panoramic radiograph reveals discrepancy in size and shape of the condyles suggestive of condylar hyperplasia of the right side of the TMJ.

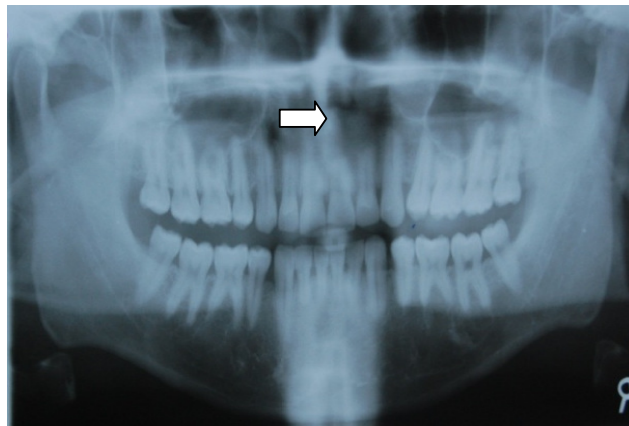


Fig-3 TMJ limitation view reveals increase in the height and size of right condyle

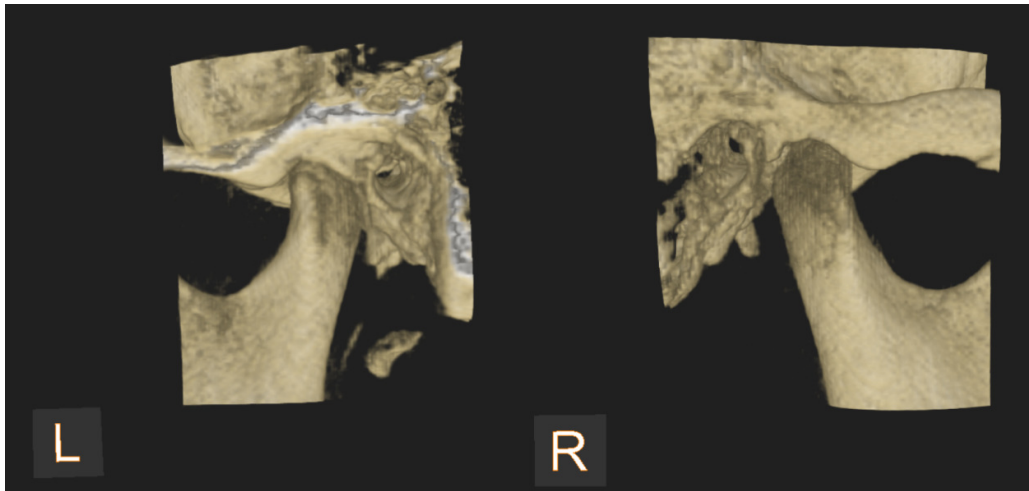
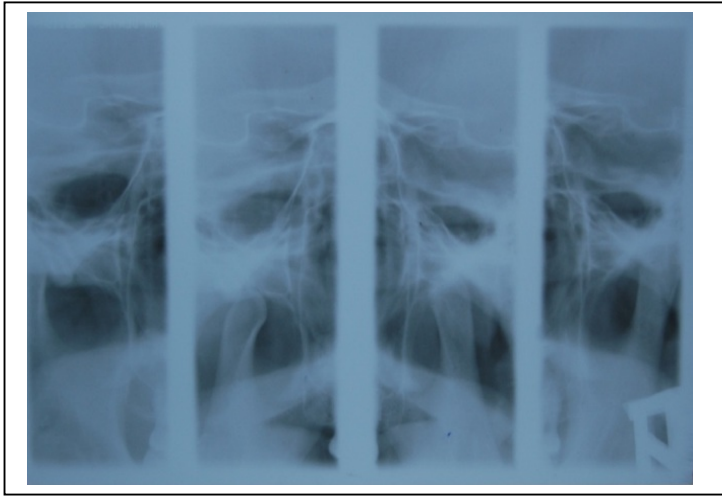


Fig 4- CBCT images(sagittal view)show variation in the condylar dimensionsie. 17 mm and 24 mm anterior-posteriorly for left and right condyles of TMJ respectively.

Case 2:A 32 year old female reported with a complaint of unsatisfactory facial appearance, pain over her left condyle and poor chewing function. On examination, extraorally showed marked facial asymmetry, deviation of chin to right side, intraorally midline shift to right side by 6 mm, crossbite on right side, open bite on left side, reduced mouth opening to 23 mm was observed.(Fig. 5,6).Occlusal canting was measured by placing a wooden tongue depressor across the right and left posterior teeth, and the parallelism to

the interpupillary plane was documented. Radiographic examination showed an enlarged left condyle suggesting CH (Fig. 7).Treatment plan was made and explained to the patient and consent taken for surgery under general anaesthesia, but patient did not report back to the hospital for correction of the hyperplastic condyle.

Fig 5 – Patient showed marked facial asymmetry and deviation of chin to right side.



Fig 6–Intra-orally there is midline shift to right side by 6 mm, crossbite on right side, open bite on left side

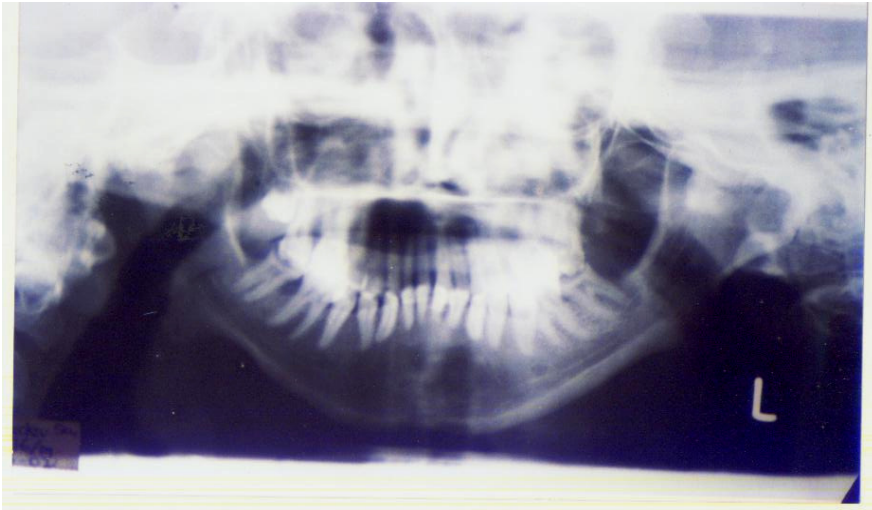


Fig 7 –Panoramic radiograph showing enlarged left condyle

Discussion

CH is the excessive growth of one condyle over the contralateral, causing an increase in bone mass of varying degree in instances where the subject's growth has decreased or ceased⁷. Lohrann in 1918 initially reported about CH followed by Groca and Meisels in 1926⁸. CH occurs with equal frequency in males and females, as well as unilaterally and bilaterally, though literature search suggests a slight predilection for females. In a systematic review by Rajmakers among 275 CH patients; a statistically significant women presented with CH

more frequently with 0.64% more than men⁹. In our report of two cases, one was a female and other male. Majority of CH cases are developed during childhood and puberty, but occasionally may develop after maturity. Abnormal rapid growth process may remain active for a period of 4-7 years and then growth may cease after completion^{13,14,15}. It has also been observed that subjects over 50 yrs can exhibit progressive CH 15A. Histological examination of the mandibular head reveals signs of growth, over activity in the articular cartilage, increase in the thickness of the proliferative zone,

hypertrophic fibro-cartilagenous zone, and endochondreal bone formation, while the articular zone remains remarkably intact. Duration of CH can be obtained from patient's history and previous photographs 16a. Facial analysis is assessed by means of a central line drawn up from the tip of the glabella, passing through the pronasal point to the end of the chin, where both hemifacial areas are identified to ascertain the difference in size and position between them. Deviation of the chin towards the contralateral side of the condyle with CH is observed. From the dental point of view, interincisive midline differences with unilateral posterior inverted occlusion or posterior open bite is observed^{17,18}. Occlusal canting can be measured by placing a wooden tongue depressor across the right and left posterior teeth, the parallelism to the interpupillary plane is documented. Alternatively, the vertical distance between the maxillary canines and the medial canthi of the eyes can be measured. Obwegeser classified the asymmetry associated with CH into 3 categories: hemimandibular hyperplasia, causing asymmetry in the vertical plane; hemimandibular elongation, causing asymmetry in the transverse plane; and a combination of the 2 entities^{8,16a}. Characteristic features of CH are enlarged condyle, elongated condylar neck, outward bowing and downward growth of body and ramus of affected mandible causing fullness of the face on that side and flattening of the face on the contralateral side, and open bite which depends on the rate of condylar enlargement and downward growth of the maxillary alveolus and teeth as seen in our second patient 20. These patients usually demonstrate a Class I or mild Class III skeletal and occlusal relationship before the onset of CH and develop into a Class III or severe Class III relationship as the condition progresses 14. Both our patients had partial trismus. Hemifacial hypertrophy, unilateral

macrognathia and benign neoplasms like osteoma and osteochondroma should be considered under differential diagnosis. In hemifacial hypertrophy, all the hard and soft tissues of the face are unilaterally enlarged, in unilateral macrognathia, unilateral enlargement of the mandible with teeth with exaggerated growth of affected condyle presenting as unilateral enlargement with downward bowing of affected mandibular body and deviation of the chin¹⁵.

Benign neoplasms like osteoma and chondroma have distinct clinical features and may warrant histopathological diagnosis. Radiographic findings of CH are quite variable, either an irregular enlargement or elongation of the condylar head is observed, or in some cases hyperplasia of the entire ramus is seen suggesting that CH can affect more than just the condyle. Panoramic and postero-anterior (PA) radiographs can be used for assessing the shapes of the mandibular condyles bilaterally to quantify asymmetry **15aa**. The lateral radiograph provides information on height and length of mandibular condyle. TMJ radiographs show abnormalities in size and morphology of the condylar head and neck regions. In PA views all facial structures are projected onto a single sagittal plane, unlike CBCT which provides 3D models of the face that incorporate accurate renditions of the teeth, skeleton, and soft tissues which help in accurate assessment of asymmetries **15b**.

Treating CH is a challenge because of the severe dentofacial deformity it creates, hence a understanding of the nature of deformity, aetiology, clinical presentation and timing of treatment is essential to achieve optimal treatment outcomes. It is important to distinguish the active from inactive form to develop appropriate treatment plan. Bone single photon emission computed tomography (SPECT) scan is an essential

diagnostic tool for visualizing hyperactivity in the condyle, especially in unilateral cases. It can also be confirmed by using ⁹⁹-technetium phosphate radioisotope scan¹⁶. It has been reported that when there is a difference in activity of 10 % or more between the two condyles, it can be indicative of CH. In addition to condylectomy, orthognathic procedures to correct the canting of occlusion can achieve rewarding results both aesthetically and functionally ¹⁵. With condylectomy, disease progression is stopped with removal of the hyperactive growth center, with physiological mandibular and dento-alveolar reshaping;

consequent normalization of the face and occlusion can be achieved if performed early. The right time of intervention is to wait until the growth phase has been completed so that condylectomy will help in having two sides equal.¹⁹

Conclusion

CH is a non-neoplastic rare malformation that changes morphology and size of mandibular condyles creating functional and aesthetic problems. As this condition can cause challenges in diagnosing, it has to be carefully differentiated with other similar conditions for planning and initiating the treatment modality.

References

1. Uma Shankar, Subhash Chandra, BHV Rama KrishnamRaju, G Anitha, K VenkataSrikanth, AfshanLaheji . Condylar Hyperplasia .The Journal of Contemporary Dental Practice, November-December 2012;13(6):914-917
2. Iannetti G, Cascone P, Belli E, Cordaro L. Condylar hyperplasia: Cephalometric study, treatment planning, and surgical correction (our experience). Oral Surg Oral Med Oral Pathol 1989 Dec; 68(6):673-81.
3. R.J.M.Gray, a.a.quayle, D.H.Carter: Histopathological and scintigraphic features of condylar hyperplasia. J OMFS 1990; 19: 65-7
4. Brice RA, Hayward JR. Condylar hyperplasia and mandibular asymmetry: A review. J Oral Surg 1968;26: 281-90.
5. Gray RJ, Horner K, Testa HJ, Lloyd JJ, Sloan P. Condylar hyperplasia: Correlation of histological and scintigraphic features. DentomaxillofacRadiol 1994; 23:103-7.
6. Sergio Olate, Henrique Duque Netto, Jaime Rodriguez-Chessa, Juan Pablo Alister, Jose de Albergaria-Barbosa, Márcio de Moraes. Mandible condylar hyperplasia: a review of diagnosis and treatment protocol. Review Article. Int J ClinExp Med 2013;6(9):727-73
7. Villanueva-Alcojol L, Monje F and González-García R. Hyperplasia of the mandibular condyle: clinical, histopathologic, and treatment considerations in a series of 36 patients. J Oral MaxillofacSurg 2011; 69: 447-455.
8. Neville, Damm, Allen and Boquot: Textbook of Oral & Maxillofacial pathology, 2nd edition, Philadelphia: W.B.Saunders, 2001:16
9. Raijmakers P, Karssemakers L and Tuinzing D. Female predominance and effect of gender on unilateral condylar hyperplasia: a review and meta-analysis. J Oral MaxillofacSurg 2012; 70: e72-6.
10. Feldmann G, Linder-Aronson S, Rindler A, Söderström U. Orthodontic and surgical treatment of unilateral condylar hyperplasia during growth: A case report. Eur J Orthod 1991;13:143-8.
11. Eales E, Jones ML, Sugar AW. Condylar hyperplasia causing progressive facial asymmetry during orthodontic treatment: A case report. Int J Pediatr Dent 1993; 3:145-50

12. Singh V, Verma A, Attresh G, Batra J. Ortho-surgical management of condylar hyperplasia: Rare case reports. *Natl J MaxillofacSurg* 2014; 5:54-9
13. Nitzan D, Katsnelson A, Bermanis I, Brin I and Casap N. The clinical characteristics of condylar hiperplasia: experience with 61 paients. *J Oral MaxillofacSurg* 2008; 66: 312-318.
14. Kaneyama, K.; Segami, N.; Hatta, N. Congenital deformities and developmental abnormalities of the mandibular condyle in the temporomandibular joint .*Congenital Anomalies* 2008; 48, 118–125
15. Hovell JH. Condylar hyperplasia. *Br J Oral Surg* 1963;1:105-11.
16. Hugo L. Obwegeses, Miro S. Makek. Hemimandibular hyperplasia – Hemimandibular elongation. *J OMFS* 1986; 14: 183-208
17. Vig KD and Ellis E 3rd. Diagnosis and treatment planning for the surgical-orthodontic patient. *Dent Clin N Am* 1990; 34: 361-384. *Int J ClinExp Med* 2013; 6(9):727-737
18. Wolford LM, Morales-Ryan C, García-Morales P and Perez D. Surgical management of mandibular condylar hiperplasia type I. *Proc (BaylUniv Med Cent)* 2009; 22: 321-329.
19. TharaniKumar, JosephArnold, SudhaJimson, K. T. Shanmugam. A Rare Case of Unilateral Condylar Hyperplasia. *Int. Journal of Contemporary Dentistry* Oct, 2011, 2(5)
20. Mohammad HoseinKalantarMotamedi: Treatment ofcondylar hyperplasia of the mandible using unilateralramus osteotomies. *J OMFS* 1996; 51: 1161-69
21. W Everton Da Rosa, Júlio Evangelista De Souza Júnior andMelina SpinosaTiussiMandibular Condylar Hyperplasia. *Hospital de Base do Distrito Federal Brazil*. www.intechopen.com
22. Xia. J.J; Gateno. J, Teichgraeber, J.F New Clinical Protocol to Evaluate Craniomaxillofacial Deformity and Plan Surgical Correction. *J Oral MaxillofacSurg*, 67:2093-2106, 2009.