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Surgery First Approach in Facial Asymmetry Caused by Hyperplasia of Mandibular Condyle: A Case Report

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ABSTRACT:

Mandibular condylar hyperplasia which was initially documented in the year 1836, is known to be an uncommon condition. It is characterized by growth of the mandibular condyle in excess causing facial asymmetry and occlusal changes. Mandibular asymmetry (MA) of this type is a relatively infrequent yet recognized condition that demands thorough surgical and orthodontic assessment and intervention. Given its association with various dental, skeletal, and overgrowth factors, treatment approaches have traditionally been tailored to each patient's unique circumstances. The current study reports a case of an adolescent male patient having facial asymmetry caused by mandibular condylar hyperplasia which was treated by high condylectomy and orthognatic surgery.

1. INTRODUCTION

Robert Adams first described mandibular overdevelopment in 1836, associating it with condylar hyperplasia. This condition, characterized by an increase in condylar volume either unilaterally or bilaterally, is a rare non-neoplastic disorder of the jaw. It typically presents with asymmetry of face with deviation of mandible, articular dysfunction and malocclusion often with no experience of pain.[1]

Hugo Obwegeser et al initially divided condylar hyperplasia into Types 1, 2, and 3, while a revised classification was proposed by Wolford et al. in 2014. The etiology of condylar hyperplasia remains uncertain, with various theories proposed. One suggests that trauma prompts a boost in local repair mechanisms and hormones, leading to mandibular overgrowth. Another perspective suggests that heightened stress on the temporomandibular joint encourages the activation of molecules responsible for bone formation.[2]

Higher number of females (approximately 64%) are affected by condylar hyperplasia. Diagnosing condylar hyperplasia (CH) typically involves a comprehensive evaluation incorporating both clinical examination and radiological assessments. Additional validation can be sought through medical nuclear imaging techniques like scintigraphy and Single-photon emission computed tomography (SPECT) bone scans. These tests are reliable as well as highly sensitive to detect the growth activity associated with this disorder.[3]

Histologically, the affected side typically exhibits irregular and thick bony trabeculae, leading to an increased percentage of surfaces that are covered with osteoid in comparison to normal. Additionally, an undifferentiated mesenchymal layer is found on the

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affected condyle along with hyperplastic and distinctive cartilage "islands" within the proximal trabeculae.[4] This report aims to present a case involving an adolescent male patient diagnosed with unilateral condylar hyperplasia. The goal is to achieve accurate diagnosis and minimal intervention to halt the progress of pathology thus achieving optimal occlusion and an aesthetic profile.

2. CLINICAL REPORT

A post pubertal male patient presented at the Orthodontics Division, Rural Dental College, Loni, Maharashtra, with the main concern of facial unevenness with irregular smile pattern. The extraoral examination showed asymmetry in the facial structure, canted lips, and a distinct deviation of the chin to the right side. (Figure 1).

During an intraoral inspection, it was observed that the posterior teeth on the left side were more prominently exposed during smiling compared to the right side. It was accompanied by a left lateral open bite of 3mm suggestive of canting. In addition to this, there was mandibular midline shifting of 3mm towards the right but the maxillary dental midline and mandibular skeletal midline were aligned. Angle's Class II subdivision molar relationship was observed on the right side whereas Class I canine relationship was observed on both sides (Figure 1).

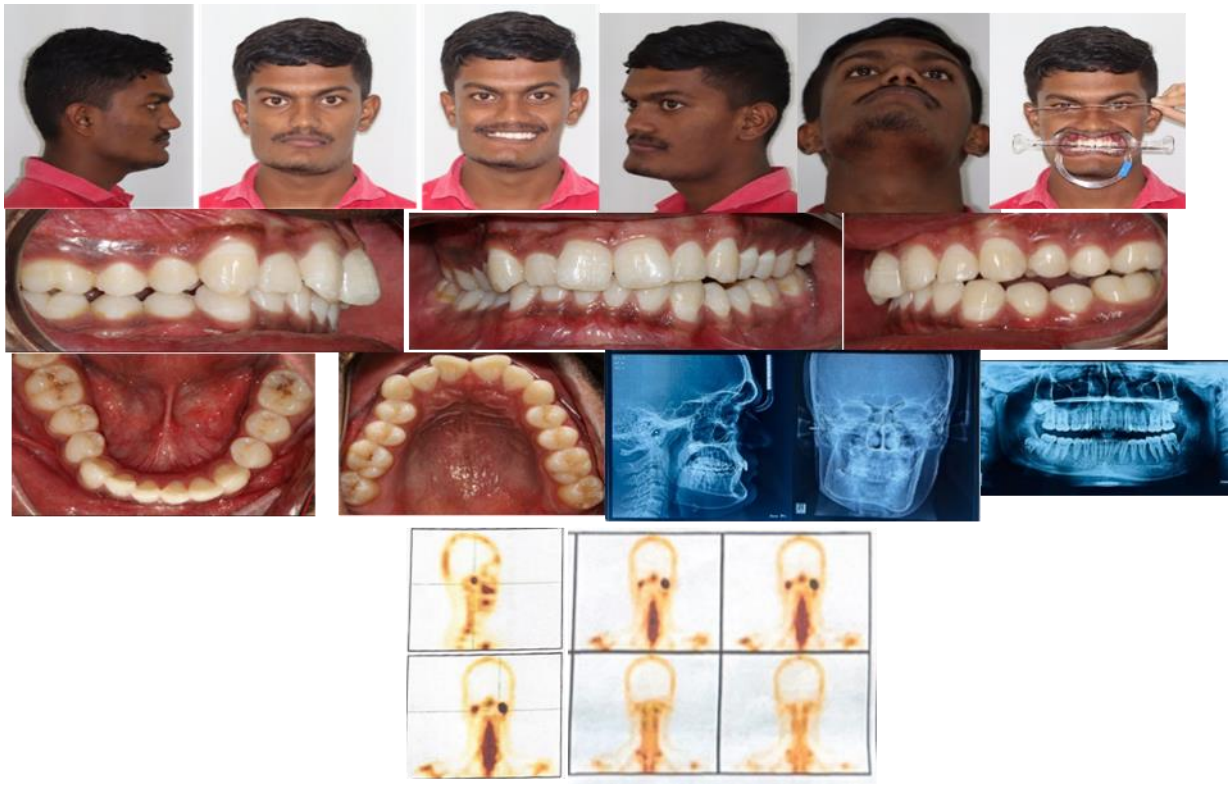

Figure 1: Pre-Treatment records and Focal uptake of Tc99m-MDP by the left mandibular condyle

The orthopantomogram indicated elongation of the left condyle relative to the right condyle (see Figure 1, Table 1). On the lateral cephalogram, a Class III skeletal base was evident (ANB = -8°), characterized by a retrognathic maxilla (SNA = 75°) and a prognathic mandible (SNB = 83°) with a decreased mandibular plane angle (FMA = 5°) and a horizontal growth pattern (Bjork sum = 385°).

The maxillary incisors showed a normal inclination (U1 to SN = 115°), while lingual inclination was seen in mandibular incisors (IMPA = 95°) (see Figure 1, Table 1). The Postero-Anterior cephalometric analysis unveiled several significant findings. Firstly,

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there was a notable 12mm deflection of the chin point on the right side (CPD). Additionally, the maxillomandibular plane exhibited a 4° tilt and a 7mm cant. Furthermore, distinct asymmetry was observed, characterized by increased length in the condyle, ramus, and body on the left relative to the right side. (Table 1)

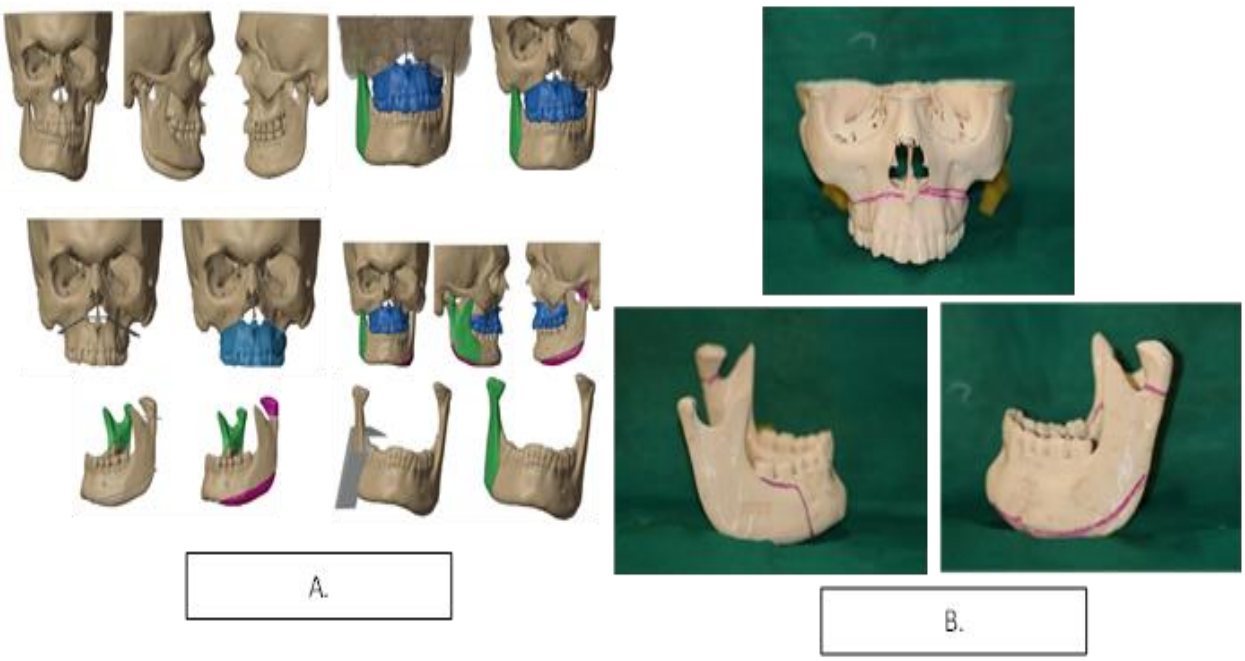

Figure 2- Virtual Surgical Planning A. Digital Surgical Planning, B. Mock Surgery on stereolithographic model for Le-fort1 osteotomy and to gauge the vertical difference between right and left ramal heights, BSSO osteotomy cut and lower body shaving.

Table no. 1: Cephalometric measurements pre- and post-treatment

Measurement	Pre-Treatment	Post-Treatment
SNA °	75°	**79°**
SNB °	83°	**83°**
ANB °	**8°**	**4°**
A to N perpendicular (mm)	**-10mm**	**-5mm**
Pog to N perpendicular (mm)	**3mm**	**-3mm**
FMA °	**5°**	**7°**
Gonial angle °	**112°**	**115°**
U1 to SN °	**115°**	**117°**
IMPA °	**95°**	**96°**
Interincisal angle	**141°**	**134°**
Chin point deviation	12	**3**
MxTOP cant	**4**	**1**
MxTOP cant (mm)	**7**	**2**
Overbite (mm)	2.7	2.1
Overjet (mm)	3.1	**2.22**

In our analysis, we noted heightened Tc99m – MDP uptake specifically in the left mandibular condyle, indicating increased activity and suggestive of aggressive unilateral condylar hyperactivity (refer to Figure 1). Additionally, noticeable canting was observed among the maxillary molars on the left side, resulting in

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extrusion and subsequent downward development of the maxillary alveolus as a counteracting response to the excessive left condylar growth. As a result, the patient was interpreted to have Angle's Class III malocclusion with facial asymmetry and a 7 mm occlusal canting attributed to left condylar hyperplasia.

Treatment objectives:

The treatment goals included:

• Evaluating the growth potential of the left condyle.

• Rectifying occlusal canting to enhance the smile line.

• Alleviating facial asymmetry.

• Attaining functional occlusion.

• Resolving mandibular deviation.

Treatment Planning:

Phase I: Surgical phase

Stage 1: Maxillary Osteotomy for Correction of Occlusal Canting

Utilizing virtual surgical planning and 3D-CT assessment, the discrepancy of 7mm between right and left maxillary heights was identified. To address the occlusal canting, a Le Fort I downfracture was undertaken, involving the unilateral removal of 7mm of bone on the left side, followed by securing it with a 3D-printed occlusal splint for stabilization. Furthermore, a unilateral sagittal split osteotomy was performed to rectify the left lateral open bite and maxillary canting (Figure 2).

Stage 2: Unilateral Condylar Hyperplasia correction by surgery

In order to control the aggressive growth in the left condyle and correct the deviation of the chin point, a relative condylectomy was performed on the left condyle. This operation used virtual surgical planning and 3D-CT analysis to correct a 7mm vertical discrepancy between the heights of the right and left ramus (see Figure 2).

Stage 3: Surgical Correction for Mandibular Asymmetry

Surgical correction involved shaving for the bowing of the left mandibular body, guided by a 3D surgical splint, to rectify mandibular asymmetry (Figure 2).

Phase II: Orthodontic Phase

Non-extraction fixed mechanotherapy with MBT technique

Objectives:

1. To achieve optimum overjet and overbite

2. To achieve Class I canine and molar relation.

Treatment Progress:

Phase I: Surgical phase

A Le Fort I osteotomy was performed to correct vertical maxillary excess, reducing 7 mm on the left side, with plating used to correct maxillary cant enabling three-dimensional repositioning (Figure 3). To address the resulting left lateral open bite, a unilateral sagittal split osteotomy was carried out on the right side, releasing the mandible so that the left pterygomasseteric sling could elevate the mandible and close the bite (Figure 3). Unilateral condylar hyperplasia was then managed following mock surgery on a stereolithographic model, which revealed a 7 mm vertical discrepancy between condyles; a relative condylectomy via a preauricular incision removed approximately 12 mm of the left condylar head, including both poles (Figure 3). As the chin profile was satisfactory, genioplasty was omitted, and symmetry was enhanced by shaving the inferior border of the left mandible (Figure 3). Residual occlusal variance and mandibular deviation were subsequently corrected over three months using fixed mechanotherapy with settling elastics (Figure 4).

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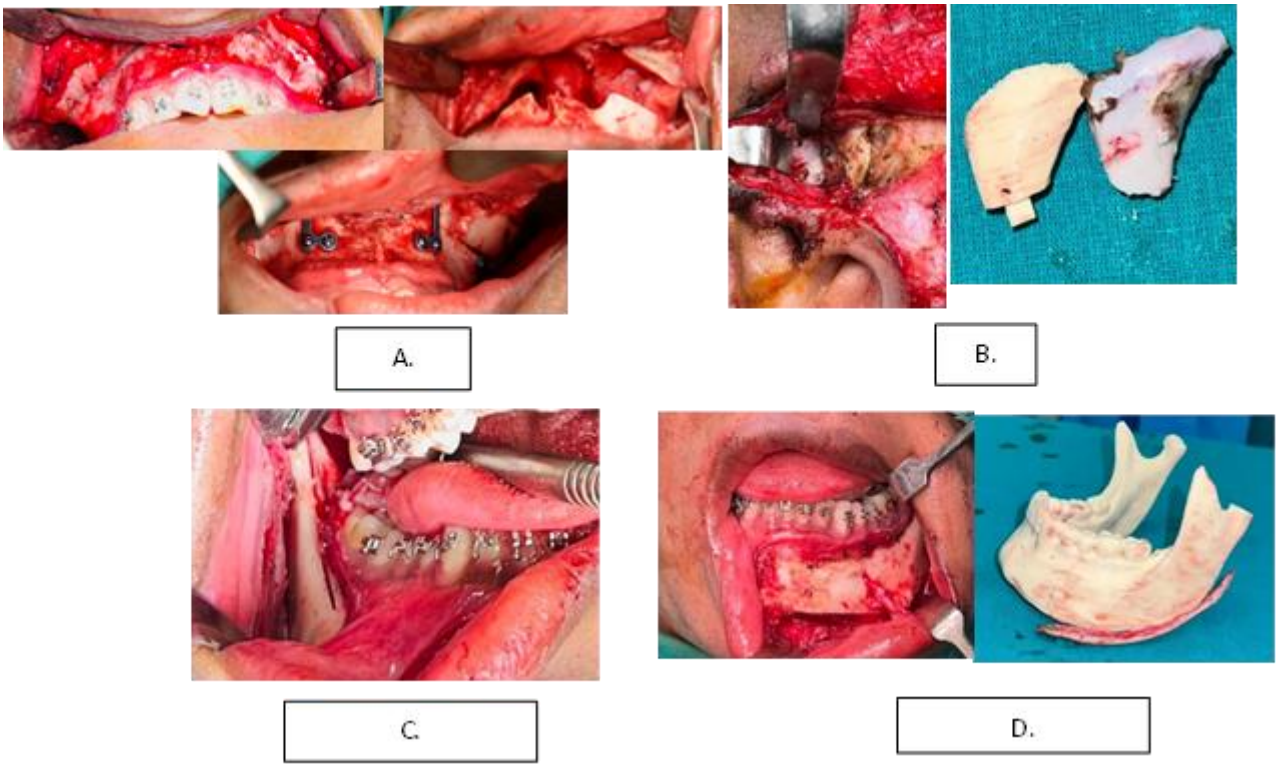

Figure 3. Surgical Procedure

A. Fixation Lefort I type osteotomy with miniplates B. Resected Section of Condyle C. Unilateral sagittal split osteotomy cut D. Resection of the corticated lower border of the mandible on the left side Note the presence of neurovascular bundle limited the extent of resection.

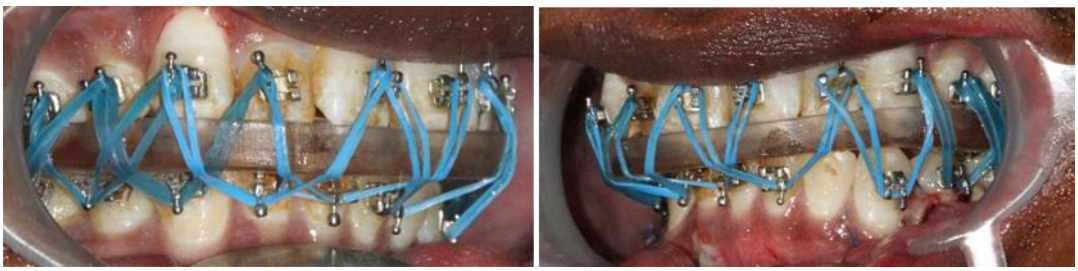

Figure 4: Fixed mechanotherapy combined with settling elastics for 3 months.

Phase II: Orthodontic Phase

Stage 1: Alignment and leveling

Upper and lower bonding was done with 0.022 slot MBT appliance. The orthodontic archwire sequence for dental leveling and alignment was done with 0.014" NiTi wire, followed by 0.016", 0.018", and 0.017" x 0.025" and 0.017" x 0.025" stainless steel wire with optimal torques. Following the completion of the leveling, alignment, and correction of dental inclinations, the focus shifted towards achieving Class I canine and molar relation. (Figure 5)

Stage 2: Unilateral distalization and space closure

To correct End-on Molar and canine relation on right side, a unilateral distalization with Bone Anchored Pendulum Appliance (BAPA) was planned. Post distalization space closure was done with friction mechanics. The intraoral photographs as depicted in figure 6.

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Figure 5: Post -Surgical records

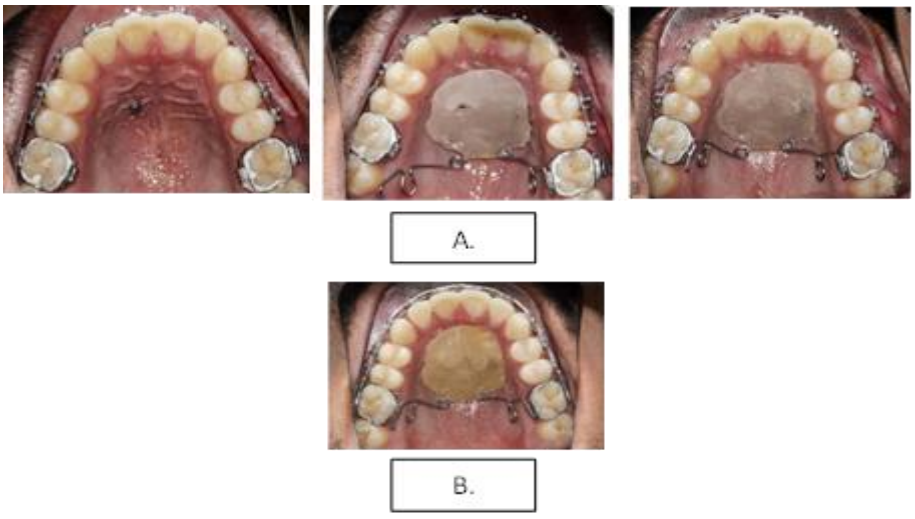

Figure 6. Distalization by Bone Anchored Pendulum Appliance (BAPA) A. Palatal implant placement, BAPA activation and placement B. Post distalization

Stage 3: Finishing and settling

After achieving desired objectives, final settling of the occlusion was done with settling elastics.

Stage 4: Debonding and retention

The patient was debonded with well settled occlusion with class I canine and molar relation. As a retention protocol, fixed spiral wire was bonded from canine to canine and Begg's wrap around retainer was given for full time wear. No deviation of mandible on mouth opening was seen. (Figure 7)

3. TREATMENT RESULTS

Following 11 months of treatment, significant progress was achieved. Ideal overjet and overbite were attained, along with the establishment of Angle's Class I canine and molar relation. Notably, the initial 12mm chin point deflection was reduced to 3mm. A lateral cephalometric

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analysis showed a Class I jaw bases, characterized by an orthognathic maxilla and mandible with a decreased angle of the mandibular plane and a horizontal growth pattern (Table 1). Superimpositions of pre and post treatment lateral cephalograms showed the significant change in the maxillary and mandibular skeletal bases with significant distal movement of maxillary molar and normal inclination of the maxillary and mandibular incisors (Figure 8).

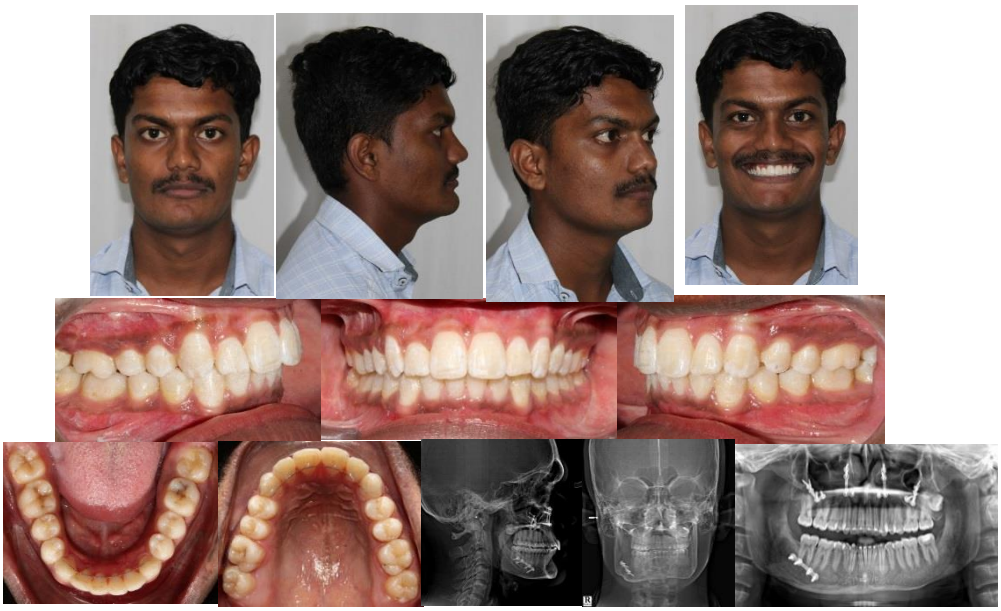

Figure 7: Post treatment Records

Figure 8: Superimposition pre- and post-treatment lateral cephalograms

4. DISCUSSION

Hyperplasia refers to the proliferation of cells within a specific tissue without an accompanying enlargement of individual cell size. When this proliferation occurs in the mandibular condylar head, it is termed condylar hyperplasia (CH), which is interpreted by changes in both condylar and facial morphology. CH is considered a rare condition interpreted by excessive bone growth, typically presenting unilaterally and resulting in facial asymmetry. In 1986, Obwegeser et al delineated two distinct hemi-mandibular anomalies: hemi-mandibular hyperplasia and hemi-mandibular elongation. These conditions can clinically manifest either independently or in combination.

The diagnosis of CH relies on various diagnostic tools and criteria, which are essential for accurate diagnosis

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and determining appropriate treatment and timing. Accurate diagnosis, coupled with timely intervention and proper treatment, can lead to effective management of CH with a huge success rate.[5]

The initial documentation of this condition dates back to 1918 when Lohamann first reported it, followed by Gruca and Meisels in 1926. The causes of Condylar Hyperplasia have not been conclusively determined. The factors triggering the onset of condylar growth and subsequent hyperplasia remain unidentified.[6] Several factors including, genetic, hormonal, biological and mechanical influences have been suggested as potential contributors to condylar hyperplasia, although definitive evidence remains elusive.

When selecting appropriate treatment, accurate diagnosis is paramount, along with determining whether Condylar Hyperplasia (CH) is currently active. To facilitate this assessment, complementary diagnostic techniques such as bone gammagraphy with 99m technetium phosphate are employed. This method involves the utilization of phosphates labeled with a radionuclide for tracking purposes. Within approximately 2 hours, bone cells metabolize these phosphates, incorporating them into regions of new bone formation. The distribution of tracking material within a specific area reflects the metabolic activity range or vascular contribution to that region, as visualized on radiographic images of condylar heads.[7] The decision to proceed with a condylectomy is typically rooted in evidence indicating active changes in the hyperplastic condyle or upon the observation of clinical or radiographic signs suggesting pathological conditions such as chondroma, osteoma, or other alterations warranting a histopathological diagnosis. Notably, distinguishing between an osteochondroma of the mandibular condyle and Condylar Hyperplasia (CH) can pose challenges.[8] Condylectomy serves not only to address asymmetry in many cases but also facilitates the histological examination of the tumor mass. Surgical interventions aimed at correcting asymmetries will vary based on the extent of mandibular deviation and maxillary vertical discrepancy of the occlusal plane.[9]

In this discussed case, the correction of facial asymmetry commenced with a unilateral sagittal split osteotomy performed on the right side to release the mandible. Subsequently, a relative condylectomy was conducted through a preauricular incision. To achieve symmetry, the mandibular lower border shaving was done on the left side. Occlusal discrepancies and mandibular deflection were corrected using fixed mechanotherapy combined with settling elastics.

Through effective diagnosis and clear communication with the maxillofacial surgeon during the surgical treatment planning phase, which involved condylectomy and orthognathic surgery with a surgery-first approach, along with post-surgical orthodontic treatment utilizing temporary anchorage devices, both the aesthetic and functional concerns of the patient with unilateral condylar hyperplasia were effectively addressed.

Intraoral distalization appliances have been designed to deliver a continuous reciprocal force on the maxillary first molars. Any action to move molars distally produces a mesial reaction force on the anchoring teeth.[10] As a consequence, if the premolars or incisors (or both) are the anchoring teeth, they move mesially, the incisors protrude, and overjet increases.[11] However, this effect is in contradiction with the main objective of Class II treatment. To obtain an effective and compliance-free molar distalization without anchorage loss, we fabricated the bone-anchored pendulum appliance (BAPA) - the pendulum appliance fixed to a palatal implant.[12]

Initially post treatment Temporomandibular Joint Replacement was planned for the patient as entire condylectomy was performed and there was a possibility of jaw deflection towards the affected side. Post treatment 3D CT showed the new bone formation at the resected condylar area with the space between the condyle and glenoid fossa being less than 0.5 cm. Hence, an additional TJR surgery was avoided and the patient is kept on follow up for every 2 months.

5. CONCLUSION

This case highlights the importance of precise diagnosis, prompt treatment, and correct biomechanics for achieving the best possible results for patients with asymmetry. The successful resolution of aesthetic and functional issues observed in this case, following condylectomy and surgery-first approach orthognathic surgery, highlights the potential for significant aesthetic enhancements and well-timed treatment interventions.

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References

1. Olate S, Netto HD, Rodriguez-Chessa J, Alister JP, de Albergaria-Barbosa J, de Moraes M. Mandible condylar hyperplasia: a review of diagnosis and treatment protocol. Int J Clin Exp Med. 2013 Sep 25;6(9):727-37.
2. Almeida LE, Zacharias J, Pierce S. Condylar hyperplasia: An updated review of the literature. Korean J Orthod. 2015 Nov;45(6):333-40.
3. Liu, Pingan & Shi, Jun. Growth trends analysis of unilateral condylar hyperplasia followed up with planar scintigraphy: Retrospective overview of 249 cases. Medicine.2021;100: e28226. 10.1097/MD.0000000000028226.
4. Pripatnanont, Prisana et al. The use of SPECT to evaluate growth cessation of the mandible in unilateral condylar hyperplasia. International journal of oral and maxillofacial surgery 2005;34:364-8.
5. Gelada K, Halli R, Hebbale M, Mograwala H, Sethi S, Patil VS. Unilateral Condylar Hyperplasia: A Case Report. Ann Clin Case Rep. 2018; 3: 1524.
6. Arora KS, Bansal R, Mohapatra S, Pareek S. Review and Classification Update: Unilateral condylar hyperplasia. BMJ Case Rep. 2019 ;12(2):e227569.
7. Saridin, Carrol & Raijmakers, Pieter & Tuinzing, Dirk & Becking, Alfred.. Bone scintigraphy as a diagnostic method in unilateral hyperactivity of the mandibular condyles: A review and meta-analysis of the literature. International journal of oral and maxillofacial surgery 2010;40:11-7.
8. Alyamani A, Abuzinada S. Management of patients with condylar hyperplasia: A diverse experience with 18 patients. Ann Maxillofac Surg. 2012 ;2(1):17-23.
9. Kim DS, Kim JY, Jeong CW, Park KH, Huh JK. Conservative condylectomy alone for the correction of mandibular asymmetry caused by osteochondroma of the mandibular condyle: a report of five cases. J Korean Assoc Oral Maxillofac Surg. 2015;41(5):259-64.
10. Proffitt WR. Contemporary Orthodontics. 2nd ed. St Louis, Mo: CV Mosby; 1993:306–307
11. Gianelly AA. Distal movement of the maxillary molars. Am J Orthod. 1998;114:66–72.
12. Kircelli BH, Pektaş ZO, Kircelli C. Maxillary molar distalization with a bone-anchored pendulum appliance. Angle Orthod. 2006;76(4):650-659.