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Case Report

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Facial Asymmetry: A Clinical Challenge. Report of a Case

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Introduction

Facial asymmetry is a common condition treated daily by Oral and Maxillofacial surgeons. Among all facial deformities, asymmetry presents the greatest challenge, as it may require early intervention or, in some cases, condylar surgery as a first step. Treatment options vary depending on the patient's condition.

The standard protocol for assessing whether the condyle is still growing includes clinical inspection and a SPECT study. It is generally accepted that a difference of less than 10% in isotope uptake between both condyles is considered within normal limits.

We present the case of a 12-year-old girl whose parents had noticed chin deviation over the past six years. The patient had begun orthopedic treatment to correct her dental occlusion.

Background

Development of the mandibular ramus depends on condylar growth [1,2]. It is important to understand that significant unilateral elongation can lead to compression and pathology of the disc and bone on the contralateral side [3-5].

The growth behavior of the condylar cartilage has genomic potential, which depends on the quantity and quality of the ectomesenchymal tissue from which it derives. However, this growth is primarily regulated by systemic hormonal factors and local functional forces, particularly those generated by mandibular function and the lateral pterygoid muscle.

Under normal conditions, condylar growth results in appropriate posterior facial height. Any disturbance in this growth can lead to alterations in vertical facial dimensions, which are partially compensated depending on the patient's functional adaptability. When condylar pathology is present, the dentoalveolar structures exhibit only moderate adaptive capacity. Growth defects in the condylar unit can be either congenital or acquired.

At birth, the cranium is disproportionately large compared to the face, following a cephalocaudal growth pattern reflective of early brain development. Over time, the face gradually "catches up."

Facial growth occurs in three planes: first the transverse, then the sagittal, and finally the vertical - the latter continuing into adulthood. Growth rates vary by facial region throughout development.

Bone growth mechanisms include:

1. Surface remodeling: with bone deposition on one surface and resorption on another.
2. Displacement (translation): where the entire bone shifts due to growth of surrounding structures.

Skeletal growth areas are divided into growth centers and growth sites:

- Growth centers are under genetic control, exhibit intrinsic growth potential, and produce active tissue separation (e.g., cranial base synchondroses, nasal septum).
- Growth sites are secondary, adapting due to growth elsewhere. Examples include cranial and facial sutures, and the periosteum.

The mandibular condyle, previously considered a growth center, is now understood to be a growth site, influenced by both intrinsic and extrinsic factors.

Clinical Question

Can hemimandibular elongation in a 12-year-old girl cause underdevelopment on the contralateral side, or might another pathology be involved? [6].

Case Presentation

In our 2019 assessment, the patient exhibited mandibular deviation to the left, with facial asymmetry (Figure: 1–3). The chin deviation was clearly visible (Figure 4), and occlusion showed an edge-to-edge incisal relationship, open bite, and left-sided crossbite (Figure 5–7).

Initial panoramic imaging revealed elongation of the right condylar neck, suggesting right condylar hyperplasia (Figure: 8). However, maximal mouth opening resulted in greater deviation to the left (Figure: 9), indicating limited left TMJ disc mobility.

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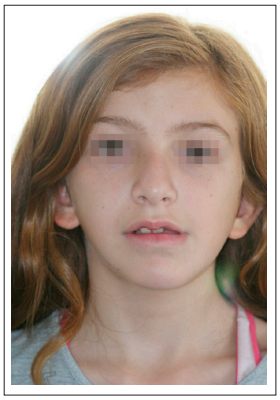


Figure 1: Clinical Aspect

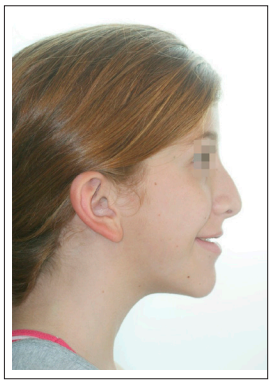


Figure 2: Clinical Aspect



Figure 3: Clinical Aspect

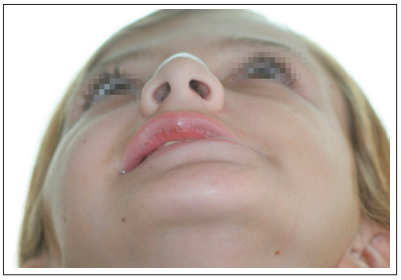


Figure 4: Chin Deviation



Figure 5: Dental Oclussion front



Figure 6: Dental Oclussion right



Figure 7: Ddental Oclussion left



Figure 8: Right condilar elongation

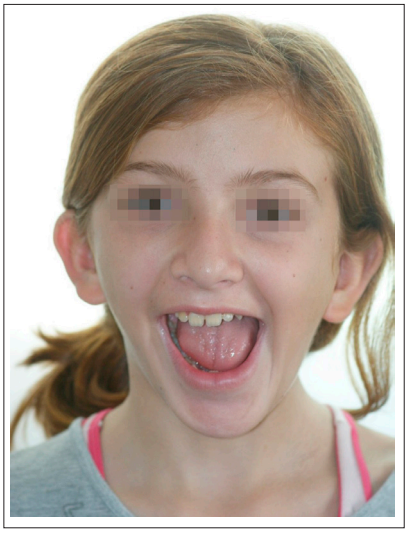


Figure 9: Open mounth Deviation pixelada final

CT imaging showed a small left condyle (Figure: 10), and MRI revealed anterior disc displacement with condylar hypoplasia and reduced hyaline cartilage at the condylar head (Figure: 11). CT measurements showed an Ar–Go distance of 46.10 mm on the right and 40.77 mm on the left, consistent with Almasan's findings.



Figure 10: Small Left Condyle

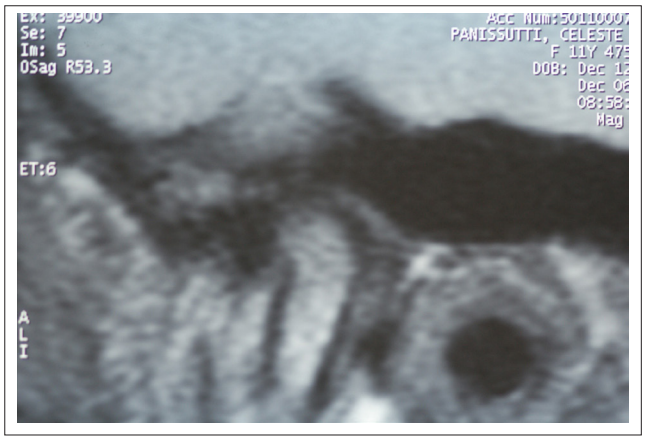


Figure 11: Left Disc ANterior Displacement

A SPECT scan was avoided, as both condyles might show positive uptake during the growth phase. Based on clinical and imaging findings, we diagnosed left condylar hypoplasia secondary to disc displacement. Following Jang and Ellis III's approach, open TMJ surgery was planned [7].

On 02/05/2019, the patient underwent surgery under general anesthesia. Via a preauricular approach, the disc was released and fixated to the external auditory canal to maintain its position during mandibular movement (Figure: 12–13).

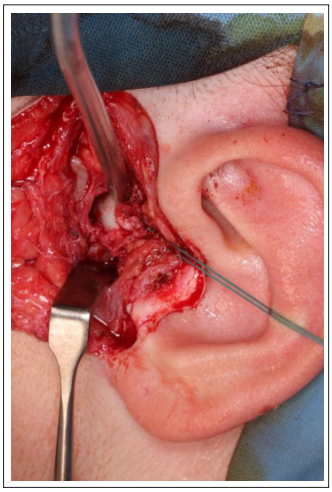


Figure 12: Disc reposition

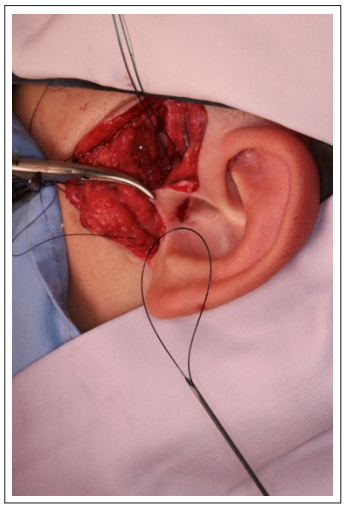


Figure 13: Disc Reposition'

Postoperative results were excellent, achieving good mandibular alignment (Figure: 15). The patient was instructed to return for follow-ups every six months but did not comply.



Figure 14: Inmediate Postop. Clinical Control

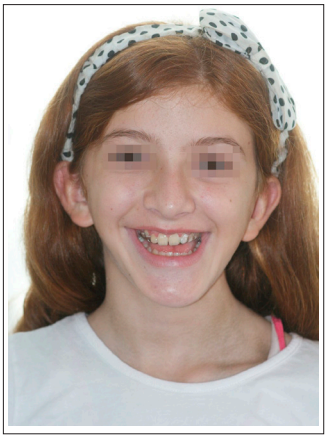


Figure 15: Inmediate Postop Clinical Control

Follow-Up

In 2021, the patient returned with significant mandibular growth and renewed chin deviation to the left (Figure: 16). At only 14 years old, we planned to correct the mandibular and chin position (Figure: 17), leaving the maxilla untouched, while considering future surgery after growth completion.



Figure 16: Inmediate Postop Clinical Control

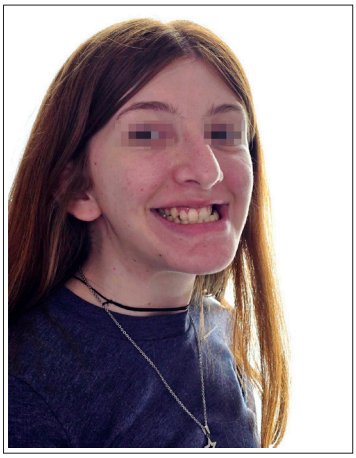


Figure 17: Persistant chin deviation

We noted notable elongation of the left condyle, likely resulting from successful disc repositioning [8]. (Figure: 18). Given the skeletal discrepancy, we opted for a surgery-first approach, planning orthodontic treatment afterward.

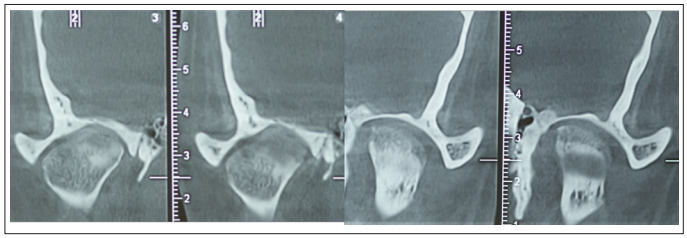


Figure 18: Left condylar Elongationn after surgery

Furthermore, psychosocial factors and facial aesthetics carry significant weight for a 12-year-old female patient. Consequently, early surgical intervention was prioritized over delaying treatment until adulthood.

A bilateral intraoral vertical ramus osteotomy was performed, along with a 10 mm chin repositioning to the right (Figure: 19).

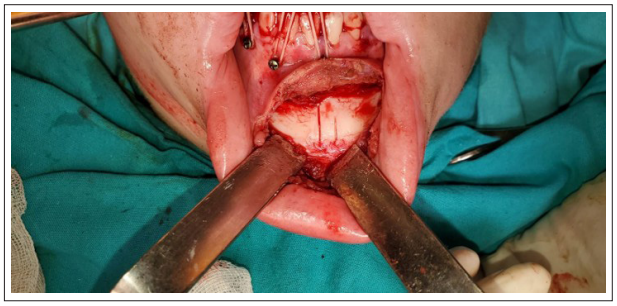


Figure 19: Chin correction

Within a few months, a favorable result was achieved, and the patient was referred for orthodontic management (Figure 20-21).

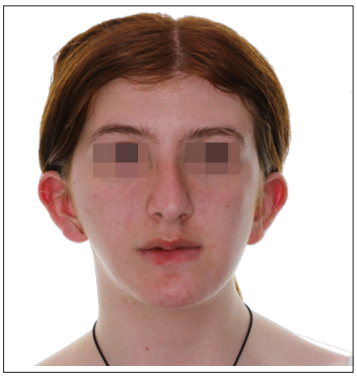


Figure 20: Postop Control

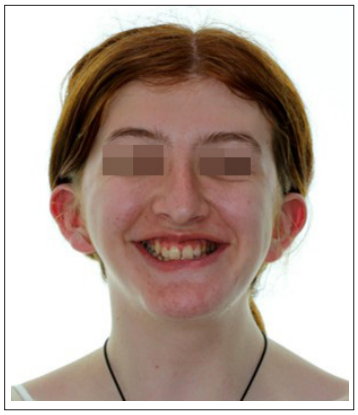


Figure 21: Postop control

Discussion

Over the years, facial asymmetry has been treated with various strategies: condylectomy, orthodontics, orthognathic surgery, or combinations of these.

The challenge intensifies in young patients, where asymmetry affects not only function but also psychosocial well-being. Quality of life is a major concern in patients with skeletal deformities [8,9]. In such cases, both orthodontists and surgeons must consider the possibility of multiple interventions due to ongoing growth.

In our case, diagnosis was initially difficult. The long right condyle coincided with deviation to the left, but imaging revealed a significantly smaller left condyle. Multiple authors have linked anterior disc displacement with impaired mandibular growth [10,11].

While some propose simultaneous orthognathic and disc repositioning surgeries [12, 13], we believe early intervention can alter the growth pattern of the affected side. Our perspective is supported by Tang [14]. and others, who demonstrated condylar volume increase after disc repositioning via arthroscopy or open surgery.

According to Moss's functional matrix theory [15], function-driven growth adaptation is especially important in young patients - thus treatments must be tailored individually [15].

Conclusion

Conservative treatment of anterior disc displacement (ADD) with Class II malocclusion in juveniles may result in condylar resorption and worsening of dentofacial deformity. Disc repositioning combined with postoperative functional splints can effectively stimulate condylar growth and help correct the underlying skeletal imbalance.

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