

Hemimandibular hyperplasia vs Hemimandibular elongation.

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Abstract:

Hemimandibular hyperplasia and hemimandibular elongation are two mandibular growth anomalies affecting one side or one half of the mandible. They both cause mandibular asymmetry and occur due to the abnormal growth pattern. Both pure and mixed forms of both these anomalies have been reported in the literature. The treatment of both these anomalies are different and hence it is essential for the clinician to know how to differentiate between the two anomalies.

Key words: *Hemimandibular anomalies, Hemimandibular hyperplasia, Hemi mandibular elongation, condylar hyperplasia.*

1. INTRODUCTION:

In the early days, the hemimandibular anomalies were solely thought of to be due to the abnormal growth pattern of the condyle on one side. The anomalies were all labelled under “ Condylar hyperplasia” by Rushton, 1951 to Howell, 1963. Later Obwegeser and Makek, 1984 claimed that both these anomalies were different and hence can't be grouped under one single entity ie Condylar hyperplasia.¹

The two anomalies do present with signs that are very typical for each of them. These can be the classical or the pure forms of the manifestation of these anomalies. Mixed forms of the two anomalies have also been reported. The hypothesis of the pathogenesis of the two anomalies was proposed by Obwegeser in 1986.¹

2. Hemimandibular hyperplasia:

The degree of manifestation of the hemimandibular hyperplasia⁵ depends on the age of the patient during the initial stage the abnormal growth occurs and also upon the degree and duration of the abnormality in growth. The abnormal growth can cease with the cessation of the growth of mandible or it can keep growing beyond that as well.

- **Classical Hemimandibular hyperplasia:**

Hemimandibular hyperplasia can be characterized by the three-dimensional enlargement of affected side of the mandible. There is enlargement of the condyle, condylar neck, ascending ramus, horizontal ramus, width of the body and length of the body. It terminates exactly at the symphysis of the affected side.

Clinical features: The patient presents with a increased height on the affected side of the mandible and the face has a rotated appearance, sloping rima orbis, no restriction in mouth opening, when the face is viewed from below, there is a striking unilateral downward projection of the ascending ramus and the angle of the mandible. The anomaly commences before puberty⁶ and the maxilla follows the downward growth of the mandible. The teeth on the affected side remain in occlusion on a lower level than on the unaffected side leading to the presentation of a cant in the occlusal plane. When the rage of growth of the mandible on the affected side proceeds rapidly and the maxilla is not able to compensate, there exists a lateral open bite on the affected side. The caudal thrust of the ramus on the affected side and the clear demarcation of the anomaly at the symphysis, manifests in the lower dentition by making the lower anterior teeth to tilt towards the affected side and the posterior teeth to lingually roll in on the contralateral side as a dentoalveolar compensation to the reduced height of the ramus on the unaffected side. The upper arch maintains the occlusion on the affected side by growing downwards as a compensation, whereas on the unaffected side, the growth can bypass the lingually rolled in posterior segment and manifest as buccal non-occlusion or buccal crossbite. It presents unilaterally.

Radiographic features⁴: Increased ramal length on the affected side, enlarged condylar head with elongated, thick condylar neck, bowing and vertical downward displacement of the lower border of mandible on the affected side, rounded angle of mandible, increased height of the body of the mandible as expressed by increased distance between the tooth roots and inferior alveolar nerve canal on the affected side when compared to the contralateral side, the mandibular canal is displaced towards the lower border of mandible, clear demarcation of the anomaly at the symphysis in the orthopantomogram and the postero-anterior view. Downward growth of maxilla with it's sinus on the affected side.

- **Bilateral:**

Bilateral hemimandibular hyperplasia can occur in conditions like acromegaly. Here the hyperplasia features are evident on both sides, with the increase in all three dimensions of the mandible, rounded angle of mandible etc.

- **Hemimandibular hyperplasia vs Condylar hyperplasia:**

Condylar Hyperplasia^{2,8} involves only the condyle, which is enlarged, and shows a coarse structure on the radiograph.

Clinical features: there is increase in facial height of the affected side, the chin prominence is shifted to the unaffected side, but not as prominent as in Hemimandibular hyperplasia. Open bite on the affected side may be present on intraoral examination. Cant in the maxially plane cannot be appreciated.

Radiographic features: Massive enlargement of the condyle⁷, no increase in width of the ramus, height or length of body of mandible on the affected side. No displacement of the mandibular canal. No line of demarcation at the symphyseal region, no rounded of angle of mandible.

3. Hemimandibular elongation:

Hemimandibular elongation is the horizontal displacement of the mandible plus chin, to the unaffected side.

Clinical features: The lower border of the mandible on both the sides lie on the same level. There is unilateral elongation of the mandible, terminating at the symphysis. The lips on the unaffected side show a furrow effect. The lateral displacement of the mandible is a striking feature on intra-oral examination. On occasion there is lingual roll in of the teeth towards the affected side. There is an absence of maxillary occlusal cant. The displacement of the mandible leads to the shift in midline towards the unaffected side

with a posterior crossbite. There is no openbite. Extraorally and occlusally, it resembles unilateral prognathism, which despite the elongation on one side does not produce the profile of true progenia.

Radiographic features: The unilateral elongation of the mandible can be noticed on the orthopantomogram as well as the PA cephalogram in an opened mouth position.

Types:

A. Slender form:

This affects the condylar neck, ramus and body of mandible. The angle of the mandible is more oblique. No change in trabecular pattern. Condyle is occasionally enlarged but it is of a minor degree. Condylar neck is clearly slender and elongated.

B. Non – Slender form:

Though the condylar neck is not noticeably elongated the features of Hemimandibular elongation is present. Condyles appear nearly normal and somewhat bigger than the slender form. The body of the mandible is elongated. Dentally crossbite and shift of midline to affected side is present. Maybe there exists a small proportion of hyperplastic component, in this form.

C. Bilateral hemimandibular elongation:

It is not so rare. It often presents asymmetrically. Both the forms can be present unilaterally and bilaterally. There is presence of an anterior crossbite. Chin prominence is deviated to one side. If there is presence of slender form on one side and non slender form on the other side, the profile need not necessarily look prognathic. Whereas when both sides show a slender form of elongation, the appearance of a prognathic profile with long and slender body of mandible and protruding chin can manifest.

Hemimandibular elongation vs Hemimandibular hypoplasia:

The hypoplasia of one side of the mandible can also simulate the appearance of the normal side of the mandible as elongated. Cases of otomandibular dysostosis are typical examples. Here the lengthening of the 3 parts – condyle ramus and body of the mandible is not seen, the angle of the mandible is not oblique, crossbite is missing intraorally. Only a class II malocclusion on the hypoplastic side, discloses that it is indeed a hemimandibular hypoplasia.

It is also possible for a combination of hemimandibular hypoplasia on one side and a true hemimandibular elongation on the other side. Cases of unilateral facial hypoplasia with contralateral hemimandibular elongation are example.

4. Combined and Hybrid forms:

A unilateral hybrid form and bilateral combined form can occur. Various combinations of the same with normal or a hypoplastic mandible on the contralateral side can also occur.

Types:

A. Bilateral combination forms:

Both hemimandibular elongation and hyperplasia can occur in the same patient, one on either side of the mandible.

B. Unilateral hybrid forms:

In this type, both the anomalies are summated on one side of the mandible. The affected side has an increase in height of the ramus and is elongated in the body of the mandible. There is flattening of the rima orbis and the occlusal plane appears canted.

5. CONCLUSION:

Thus it is evident that there are various forms of the two unilateral anomalies of the mandible. It is important to know the clinical and the radiographic features of the two so that it aids the clinicians in proper diagnosis of the same.

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