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Case Report

Rarest muscular imbalance, neutral zone shift and facial asymmetry



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rarest, unreported, case of facial asymmetry due to muscular imbalance and neutral zone shift producing unilateral skeletal facial asymmetry is presented.

Case report

A 22-year-old female patient reported with the complaint of asymmetric face. On examination, there was prominent bulge at the right corner of the oral cavity giving an appearance of a swelling (Fig. 1). The fear of tumour was one of the main concerns for the family. The onset of problem could not be vividly elicited by the patient or family except that mild asymmetry was first noticed at about the age of 12 years which slowly increased over time. No obvious cause could be traced in the form of trauma, severe illness, exposure to severe cold etc. The prominent extraoral and intraoral features were as described in Fig. 2. At rest the right commissure appeared drooping. There was asymmetric lip incompetence, the philtrum was slightly deviated to the left and the nasolabial fold of the right side was partially obliterated.

On smile there was no movement of the right corner of the mouth while left had normal contraction. Besides, there was an obvious deviation of the right half of upper lip, philtrum and right side of lower lip towards left during function showing complete mismatch between the hard and soft tissue relations.

On palpation of soft tissue at the commissures there was no sign of tenderness, fibrosis or calcification. The only

Introduction

Some degree of facial asymmetry is integral to every face and contributes to its uniqueness. But any change at the macro level produces disfigurement and becomes a social stigma. The aetiology of facial asymmetry includes congenital disorders, acquired diseases, and traumatic and developmental deformities.¹ The facial muscles are subcutaneous muscles which bring about different facial expression.² As they contribute to aesthetics and function, their loss of function causes unaesthetic appearance and functional impairment. A

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Fig. 1 – Comparison of the right and left side of face revealing right sided facial asymmetry.

difference was that the modiolus region of right side was less prominent compared to the left side. The swelling of the right side of face appeared prominently in maxillo-mandibular dentoalveolar segment as it didn't extend to the basal regions.

Intraorally, tooth 16, 17, 48 were carious and 36 was missing. No other hard or soft tissue abnormality was found. There was symmetric expansion of maxillary and mandibular dentoalveolar segment maintaining excellent occlusal contacts around the right corner of the mouth. The spacing between upper/lower anterior teeth on the right side and increased positive torque were testimony to uniform dentoalveolar expansion.

Functional analysis of the muscles of facial expression showed lack of horizontal wrinkles on the right side of forehead, normal closure of both eyes, lack of puffing on the left side (Fig. 3). Besides, lower lip had normal sensory function and there was no activity of the platysma muscle. The taste sensation of the right anterior 2/3rd of the tongue was normal.

Investigations

CT scan was done as specialized investigation to rule out any bony pathology and its extent. Hard and soft tissue CT scan

(Fig. 4) revealed the nature of asymmetry. There was increased prominence of the roots of lateral incisor and canine in both arches on right side and consequent soft tissue prominence. The spacing between dentition on right side is consistent with the case description (Fig. 5).

Diagnosis

The examination and investigations lead to diagnosis of a rarest, yet unreported, case of facial asymmetry secondary to partial facial nerve palsy of the right side. This created an imbalance between the intraoral musculature in the form of tongue and the opposing extraoral musculature formed by muscles of facial expression at the corner of the mouth thus shifting the neutral zone of right side, producing uniform dentoalveolar expansion and hence the skeletal facial asymmetry.

Discussion

According to equilibrium theory any object subjected to unequal forces will be accelerated and thereby will move to a new position in space.³ From this perspective, the dentition is in a state of equilibrium as the teeth though subjected to variety of forces do not move to a new location under normal circumstances. Although, masticatory and swallowing forces are of higher magnitude their total duration is too small, to produce any change in the equilibrium. A second possible contributor to the equilibrium that governs tooth position is pressure from the lips, cheeks, and tongue. These pressures are much lighter than those from masticatory function, but are of much greater duration to successfully affect the tooth position in an altered equilibrium.⁴

There are various examples of the dentofacial deformity produced by disturbance in the equilibrium of intraoral and extraoral forces. The scarring and contracture of the corner of the mouth, as due to burn, results in the lingual displacement of the incisors as lip tightens against them.⁵ Similarly, scar due to cleft lip and palate surgery restricts the growth of the maxilla leading to skeletal Class III malrelation and lingually tipped upper incisors.⁶ Excessive muscle contraction can restrict growth in much the same way as scarring after an injury, as seen in torticollis.⁷ On the other hand, a major decrease in tonic



Fig. 2 – Extraoral rest and smiling view and right lateral intraoral features of asymmetry.



Fig. 3 – Functional analysis of muscles of facial expression revealing deficit.

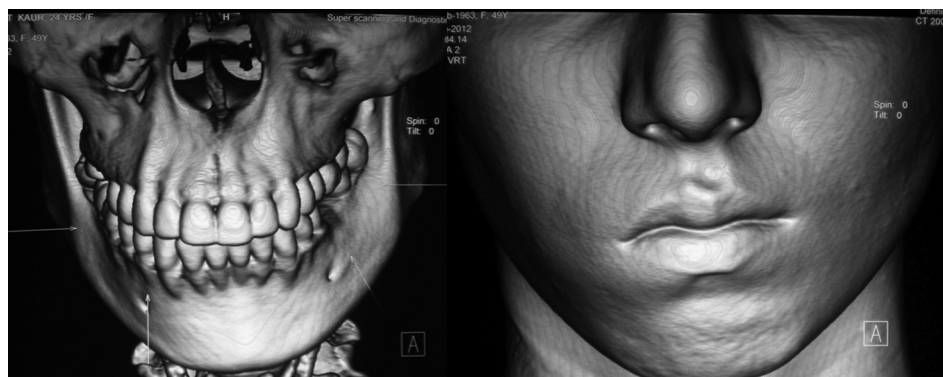


Fig. 4 – Hard and soft tissue CT scan showing the nature of asymmetry.

muscle activity allows the mandible to drop downward away from the rest of the facial skeleton producing open bite.⁸

The forward resting posture of the tongue could affect tooth position, vertically or horizontally even though the pressure is very light.⁵ In the present case there was no open bite or protrusion of anterior teeth proving that tongue position was normal.

This case report on facial asymmetry produced due to unilateral partial facial nerve palsy is unique due to the nature of asymmetry produced over a long period of time and negligible literature available on this. Though the involvement of facial nerve in Bell's palsy is widely recognized,⁹ no reference of such clinical manifestation as facial asymmetry involving hard tissue component has ever been made. The long term

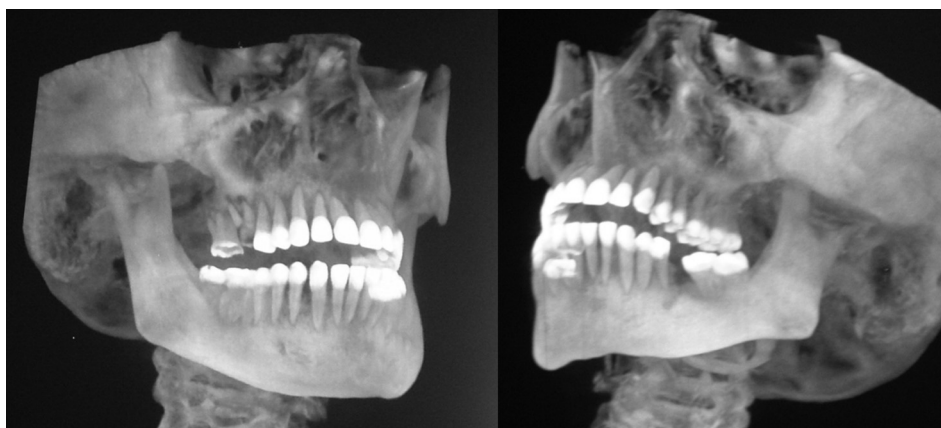


Fig. 5 – CT scan of right and left side dentition revealing dental adaptation.

cases of Bell's palsy can further be examined/investigated for this clinical manifestation.

Of all the facial muscles, the buccinators; the muscles of the cheek, flattens cheek against gums and teeth and equalizes the tongue pressure to establish the dentoalveolar equilibrium of the two arches in the left and right halves.¹⁰ The non-functional buccinator due to unilateral partial facial nerve palsy can predominantly predispose to the unequal pressures on the right and left dentoalveolar segments leading to expansion of the non-functional side as in the present case.

Conclusion

This is a truly unique finding, yet unreported in literature and is a diagnostic marvel as treatment plan is highly dependent on correct diagnosis. The case is under management in consultation with plastic reconstructive surgeon.

Conflicts of interest

All authors have none to declare.

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