Mandibular Premolar Macrodontia And Its Association With Bilateral Posterior Crossbite; A Case Report

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ABSTRACT

Macrodontia presents various complications such as arch length discrepancies, unstable occlusion and esthetic issues. Complex treatment planning and a multidisciplinary approach are required in treating these patients. We have presented two cases of bilateral mandibular second premolar macrodontia associated with a bilateral crossbite.

Keywords: Crossbite, Macrodontia, Premolars.

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INTRODUCTION

Aberrations in the normal sequence of dental morpho-differentiation lead to various developmental anomalies, including macrodontia, microdontia, taurodontism etc.[1] Understanding these morphological variations in the stomatognathic system and teeth is important to diagnose and understand for the provision of effective patient care.

Megalodontia, macrodontia and megadontia are the terms synonymously used for describing dental gigantism, which refers to two-fold or more increase in the size of the tooth than their normal morphological dimensions.[2] Megalodontia is generally divided into three types: generalized (all the teeth greater than normal in dimensions), relative generalized (normal or slightly larger teeth in smaller size jaws), and isolated localized forms involving single teeth. True generalized enlargement of teeth is usually associated with pituitary gigantism and is extremely rare.

Maxillary central incisor and mandibular third molars are the most commonly affected. Literature is scarce on mandibular second premolars macrodontia. Problems generally observed in such cases include arch crowding, impacted teeth, difficulty in establishing ideal occlusion and function, which require a multi-disciplinary approach. Here we present a rare dental anomaly, i.e. bilateral mandibular second premolars macrodontia observed with bilateral posterior cross-bites.

CASE REPORT

Patient A, male, age 14 years and five months, presented to Orthodontics Department, Armed Forces Institute of Dentistry, Rawalpindi with the complaints of mal-aligned teeth. Extraoral examination revealed a convex, hyperdivergent facial profile with typical features of adenoid facies. Smile evaluation showed wide buccal corridors with a consonant smile and visible crowding. Intraorally patient had a complete set of dentitions, including second molars, which were fully erupted and in satisfactory occlusal relationships. Molars were bilaterally in class 1 occlusion, whereas canines were buccally ectopic, incisor class with normal overjet and overbite. Bilateral posterior skeletal crossbites were present with no mandibular deflection or deviation evidence. The temporo-mandibular joint evaluation revealed a normal joint with no clicking evidence and no muscle tenderness.

Cast analysis revealed an ovoid-shaped maxillary arch. A bilateral posterior crossbite of 4 mm was present with a deep palatal vault measuring 23mm. All the teeth were crossbitten, excluding the maxillary central incisors and second molars. Lateral open bites were present in the canine and first premolar region. Canines were buccally ectopic, and an arch length discrepancy of -12 mm was recorded. The mandibular arch had a squarish archform, a deep curve of spee measuring up to 3.5 mm and an arch length discrepancy (ALD) of -11mm.

Bolton discrepancy analysis revealed an overall 96.5% Bolton ratio indicating an increase in mandibular tooth size. To further distinguish, the anterior Bolton ratio was calculated, which was 71.5, indicating a discrepancy in the posterior region. The right mandibular second premolar had a mesiodistal dimension of 10 mm, and the left premolar had a dimension of 10.5 mm and was rotated entirely around its long axis.

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Patient B, female, age,[15] years and four months, presented with the chief complaint of malposed teeth. Extraoral, she had a convex profile and lip incompetency at rest. Intraorally, molars were bilaterally in a class II relationship with severe bimaxillary crowding. Cast analysis revealed an ovoid maxillary arch form with bilateral posterior crossbite and deep palatal vault. ALD of -10mm in the maxilla and -4mm in the mandible. Inter molar width was 26 mm. Bolton discrepancy revealed an overall ratio of 96%, indicating an increase in mandibular tooth size. Anterior Bolton discrepancy was normal, indicating a discrepancy in the posterior region. Lower right 2nd premolar had a mesiodistal width of 9.5mm and left 2nd premolar was 10.5mm in mesiodistal dimension.

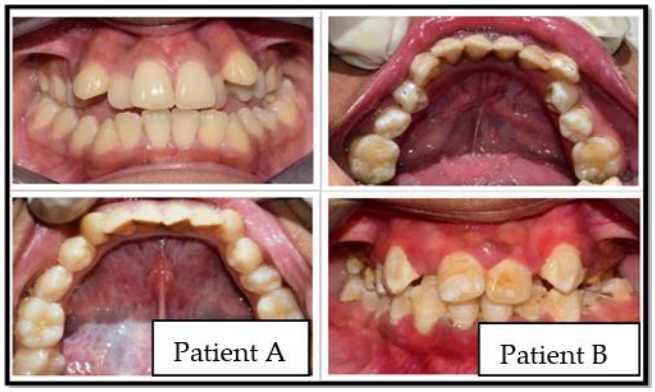

Figure: Macrodontia and bilateral cross bite of patient A and B.

DISCUSSION

The prevalence of megadontia in permanent dentition is around 0.03-1.9%,[3] with a higher occurrence observed in the male gender. Complex multifactoral genetic, epigenetic and environmental factors have been associated with macrodontia.[4] Its genetic aetiology has been established in various studies and is linked to various syndromes. Otodental syndrome,[5] 47XYY syndrome, KBG syndrome,[6] insulin resistance diabetes and facial hemi hyperplasia has been reported to have various anomalous dental variants, among which megalodontia is one of the highlighted features.

Macro premolars have an overall prevalence of 1.1%, with a higher incidence in males (1.2%) than females (0.9%).[7] This phenomenon has been described as molariform premolars or post canine megadontia.[8] The isolated molariform premolar is a rare dental anomaly with around 5 cases reported in the literature, including three bilateral and two unilateral cases, all of which were found only in mandible.[9] Its association with bilateral crossbite has not been established as such.

Megalodontia may cause problems with the aesthetic alignment of dentition associated with severe crowding. Regarding orthodontic treatment, these megadonors present with finishing problems and difficulty establishing ideal occlusion.[10] Treatment of such patients involves early recognition and treatment of crossbites and judicious space management.

Concurrent bilateral posterior crossbite and Bolton discrepancy in the mandibular posterior region due to megadont mandibular premolars have been observed. Early detection and management of these rare anomalies require a multidisciplinary approach. To treat these types of complex malocclusions is a challenging task for an orthodontist, requiring proper space management and treatment planning.

Conflict of Interest: None.

Authors' Contribution

FH: Conception of idea, design of research, formulation of manuscript, AAB: Supervisor, conception of idea, design of research, MK: Formulation of manuscript, ST: Data analysis and interpretation.

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