

Macrodont Molariform Premolars: A Rare Entity

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ABSTRACT

Developmental dental anomalies involve variations in the tooth structure both morphologically and anatomically. Any abnormal events that occur during the embryologic development caused by genetic and environmental factors affect the morphodifferentiation or the histodifferentiation stages of tooth development. Macrodontia is a rare type of dental anomaly characterized by excessive enlargement of the mesiodistal and faciolingual tooth dimensions with an increase in the occlusal surface of the crown. The affected tooth exhibits proportionately shortened roots when compared with the body of the tooth. This may lead to compromised esthetics as well as crowding due to abnormal tooth arch size ratio. There have not been many cases of bilateral macrodontia reported in the literature. This case report presents a patient with bilateral macrodontia in mandibular second premolar region both clinically and radiographically.

Keywords: Macrodontia, Megadontia, Megalodontia, Molarization.

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INTRODUCTION

Macrodontia is a rare type of dental anomaly characterized by excessive enlargement in the overall crown structure resulting from disturbance at morphodifferentiation stage of tooth development. The term “macrodontia” has been used to describe a rare morphological anomaly of dental gigantism.¹ Macrodontia is also termed as “megadontia,” “megalodontia,” and “macrodontism.”^{2,3} Though this condition is found to be associated with systemic disturbances or syndromes, such as insulin-resistant diabetes, facial hemihyperplasia, Ekman-Westborg-Julin syndrome, and 47XXY syndrome, the exact etiology still remains an

enigma to the dentists.^{4,5} The prevalence of macrodont permanent teeth is 0.03 to 1.9%, with a higher frequency in males.⁵ Among the reported eight cases of mandibular second premolar macrodontia, bilateral mandibular second premolar macrodontia has been found only in five cases, with the first case reported by Primack in 1967.⁴

Macrodontia can be broadly classified as “true generalized” where all teeth are larger than normal, “relative generalized” with normal or slightly larger teeth in smaller jaws, and isolated macrodontia of single tooth.⁶ Isolated macrodontia is an extremely rare condition pertaining to a single tooth common among incisors and canines and could be seen as a simple enlargement of all tooth-related structures or maybe related to some morphological anomalies. It is very rarely seen in premolars and molars.⁷ Macrodontia of premolars, when present, may be confused with fusion or gemination with the adjacent tooth to form a single tooth. Also the unusual morphology of these teeth increases the risk for caries. This case report presents clinical and radiographic findings of isolated bilateral macrodontia of mandibular second premolars.

CASE REPORT

A 12-year-old male patient was referred to the Department of Pedodontics, Royal Dental College, Chalissery, Kerala, India, with a chief complaint of pain in the lower left back tooth. Patient gave no history of any systemic illness. On intraoral examination, unusually large premolars morphologically resembling the first molar and that appeared partially submerged were identified bilaterally in the mandibular second premolar region (Fig. 1). Intraoral periapical radiograph of both the teeth showed wide pulp chambers with short roots suggestive of macrodontia (Figs 2 and 3). Orthopantomograph revealed left mandibular second premolars with complex coronal and radicular pulpal anatomy having a large sized, multitubercular crown and short or absent roots (Fig. 4). Both the premolars had multiple cusps and the occlusal surface presented with carious lesions (Figs 5 and 6). There is a diffuse coronal radiolucency involving enamel, dentin, and pulp chamber. Right mandibular second premolar showed complex coronal anatomy, having a large sized multitubercular crown and two short conical roots (Figs 7 and 8). Periodontal ligament space appeared to be normal for both the teeth. Since both the teeth had carious lesions, the treatment plan included bilateral extraction. The teeth

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Fig. 1: Intraoral view of premolars

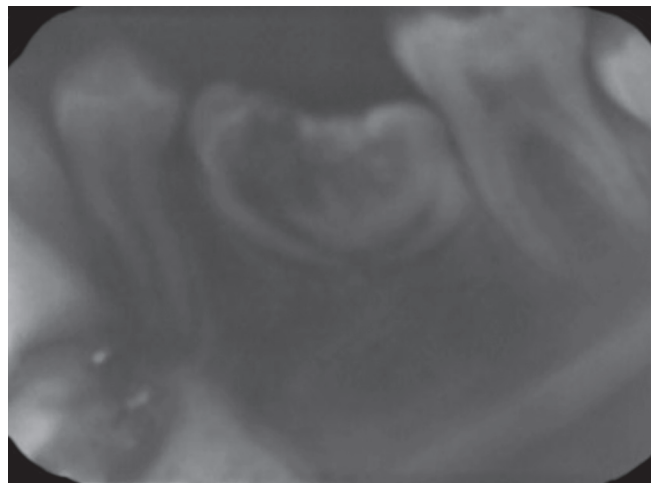


Fig. 2: Periapical radiographs of right premolar

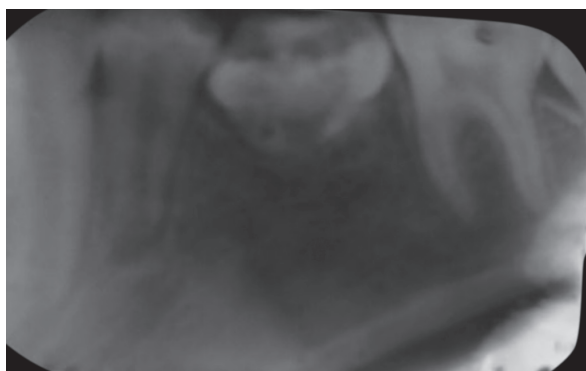


Fig. 3: Periapical radiograph of left premolars



Fig. 4: Panoramic radiograph of macrodont premolars



Fig. 5: Occlusal view of left macrodont premolar



Fig. 6: Occlusal view of right macrodont premolar

were extracted in two consecutive sessions under local anesthesia. Healing was uneventful. The crowns of the extracted premolars measured 17 mm mesiodistally and 10.1 mm (right) and 10.3 mm (left) buccolingually.

MANAGEMENT/PROGNOSIS

Since both the teeth had complex tooth morphology and pulpal anatomy and were presented with deep carious lesions, any effort to perform an endodontic treatment

would be vain. Hence, both the premolars were extracted. During subsequent follow-up, the extraction site showed uneventful healing. The patient failed to report back for any functional rehabilitation.

CLINICAL IMPLICATIONS/CONCLUSION

Dugmore coined the term “macrodont molariform premolars” to describe the abnormally large premolars that show similar morphology to molars.⁸ It should be applied

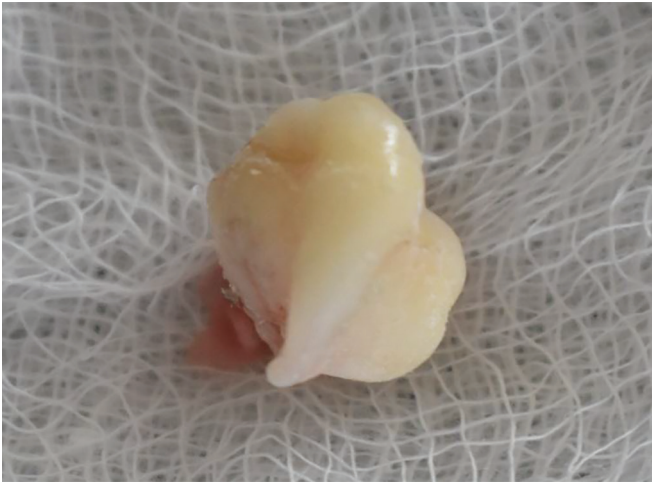


Fig. 7: Mesial view of left macrodont premolar



Fig. 8: Labiolingual view of right macrodont premolar

only when teeth are physically larger than usual and not include normal-sized teeth crowded within a small jaw.⁷ Since the premolars erupt between the age of 11 and 12 years, most of the disturbances with the eruption of macrodont second premolars and concomitant disruption of developing occlusion or alveolar enlargement become evident during this period. Premolars are known to have variations in their morphology, sometimes presenting with one, two, or three cusps on the buccal and lingual side of the teeth. Apart from all these variations which fall within the normal range, these teeth can show an extremely rare form of anomaly where the tooth shows morphological similarity to molars: molarization. Macrodontia of mandibular second premolars, being an extremely rare condition, has been reported exclusively in children around 8 to 14 years, with only one exception. Thus, any intervention should be completed before maturity, and, in light of previous reports, extraction appears to be the only available intervention. Macrodontia is believed to be associated with genetic and environmental factors. It is quite unusual to find localized macrodontia alone, as it is associated with a syndrome or a systemic disease but, here in this case, the patient does not have any systemic illness. It has been found that dental growth-promoting factors are present on X and Y chromosomes, with the promoting effect of Y chromosome being stronger than X chromosome.⁹ As mentioned earlier, macrodontia has been found in sexual chromosomal anomalies. Studies have shown that mutations of AGPAT2 genes or BSCL2 genes and ANKRD11 genes have been associated with macrodontia. Here, in this case, the patient presented with a bilateral macrodontia as the mandibular premolars on both left and right showed excessive enlargement of the crown structure. Both the premolars had erupted into the oral cavity but appear to be partially submerged. The premolars had an abnormal ovoid molariform crown that resulted in crowding in mandibular anterior region. Since both the teeth had carious

lesion, it was decided to extract under local anesthesia. The complex tooth morphology and pulpal anatomy, tooth position, and difficulty in rubber dam placement may negate endodontic treatment and necessitate surgical removal of the affected tooth.¹⁰ Macrodontia may result in malocclusions and eruption disturbances. The primary concern in treating macrodontia is esthetic concern. Since isolated bilateral macrodontia of the mandibular second premolars is an extremely rare entity, it is very important for dental practitioners to identify such dental anomalies so as to avoid any complications related to pulpal and periodontal treatment. A thorough knowledge with regard to macrodontia also helps in detecting any systemic illness or syndromes associated with it.

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