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Bilateral Mandibular Second Premolar Macrodontia: An Enigmatous Anomaly

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Abstract The otherwise considered being one of the smallest and weakest teeth in the arch, mandibular second premolars have been found to almost double its size in macrodontia. Such anomalies of morphological alterations have caused the teeth to be more weak and prone to diseases, as accredited to the increased surface area and particular morphology. Bilateral mandibular second premolar macrodontia is an extremely rare dental anomaly with only 5 cases reported to date, among which the first case was reported in 1967 by Primack. This article focuses on a rare case report of bilateral macrodontia of mandibular second premolar in an 18year old male.

Keywords: *macrodontia, second premolar, developmental anomalies of teeth*

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1. Introduction

The term macrodontia has been used to denote a rare morphological anomaly of dental gigantism [1]. Complete understanding of the stomatognathic system and the morphological alterations of various teeth is of importance to the dentist for ensuring effectiveness of treatment. When the space that is allotted is occupied by a larger object; constraints occur. This is what happens in macrodontia (megadontia). Like the axiom, "function determines form", form also sometimes play a pivotal role in executing function. Macrodontia has been reported to be associated with a large number of syndromes such as the otodental syndrome, 47 XYY syndrome, facial hemi hyperplasia and insulin resistant diabetes to name a few [2-7]. Isolated cases of bilateral mandibular premolar macrodontia have also been reported as a rare anomaly [8,9,10,11].

The etiology of this anomaly still remains in the grey [12], but suggested etiologies include disorders during the morpho-differentiation stage of development [13]. However, it was found to affect both sexes equally [14]. Among the reported 8 cases of mandibular second premolar macrodontia, bilateral mandibular second premolar macrodontia has been found only in 5 cases, with which this can be considered as an extremely rare anomaly, which inspired us in documenting the present case.

The main concern regarding the identification of such developmental anomalies lies in the fact that they can affect the functions of the stomatognathic system by creating disturbances in the maxillary and mandibular arch lengths and occlusion [15]. Also these teeth are comparatively at increased risk of caries and causes disruption of developing occlusion by occlusal morphology. It can also lead to crowding as a result of reduced arch length-tooth size ratio [16]. Macrodontia can be broadly classified as: true generalized (all teeth are larger than normal), relative generalized (normal or slightly larger teeth in smaller jaws), and isolated macrodontia of single tooth [17]. It is characterized by the excessive enlargement in the overall dimensions of the teeth, both mesiodistal and buccolingual, increasing the occlusal surface area.

2. Case Report

An 18 year old male reported to department of oral medicine and radiology, Sri Sankara dental college on September 2013, for a routine dental check up. He had no relevant medical, surgical, dental, personal and family history. No abnormalities were detected on extra oral examination. Intra oral examination, soft tissue findings were within normal limits except for the plaque accumulation. No evidence of any periodontal diseases or caries. The peculiar size of the mandibular second premolar was noticed bilaterally as evidenced by the magnified anatomical appearance (Figure 1& Figure 2). The occlusal anatomy of the premolars was maintained barring an increase in size. So dental history and family history was further inquired. Neither his parents nor siblings has similar dental anomaly. Patient recollected a

normal exfoliation pattern without any sort of dental abnormalities. A complete dentition was developing including the third molars which was at the erupting stage.

Figure 1. Macrodontia of right mandibular second premolar. Tooth appeared broader mesio-distally and bucco-lingually compared to the normal range and is lingually erupted

Figure 2. Macrodontia of left mandibular second premolar. Tooth appeared broader mesio-distally and bucco-lingually compared to the normal range

The tooth could be well distinguished clinically due to its prescribed morphology but the mesiodistal and buccolingual dimensions were largely altered presenting difficulties in occupying its position. The mesiodistal diameter was 10.5mm in the right and 10.0mm on the left side. The buccolingual dimension at the cervix was 10.0mm. Occlusally it had an ovoid form and was slightly lingually erupted probably due to lack of space causing crowding in the arch. To finalize the anomaly, an OPG was taken. Radiographically, both the mandibular second premolars presented with single root and increased crown and root dimension (Figure 3). Right mandibular second premolar appeared broader mesio-distally when compared to macrodontic left mandibular second premolar and has short root.

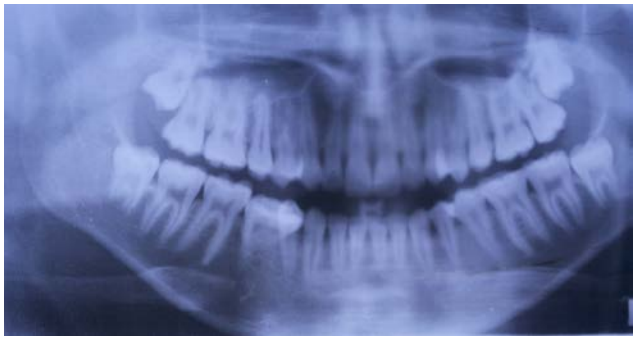

Figure 3. OPG showing macrodontia of both the mandibular second premolars with single root and increased crown and root dimension

3. Discussion

The understanding of the various anomalies that could arise should be known to the clinician for providing the apt treatment. In these days of growing aesthetic concerns, the clinician should be aware of the morphological differences and alterations and to mould the treatment accordingly.

Being an extremely rare condition, macrodontia of mandibular second premolars has been reported almost exclusively in children of age 8–14 years. The first bilateral mandibular second premolar macrodontia case was reported in 1967 by Primack, in which both the tooth were unerupted. And an year later Hermel et al., reported bilateral macrodontia in erupted mandibular second premolar. [18] In 1974 Ekman-Westborg et al reported a similar case in which left second premolar was erupted and right counterpart was unerupted. The last of such case was reported by Dugmore in 2001 in which both macrodontic mandibular second premolars was erupted [18].

The etiology which largely remains unclear is mainly attributed to genetic and/or environmental factors during the developmental stage. Our case can be categorized under isolated macrodontia. The mesiodistal dimension of the mandibular second premolar was found to be 10.5mm in the right and 10.0mm in the left side; as compared to the normal 7.0mm mesiodistal diameter. The buccolingual width was also found to be 2mm larger than the normal 8.0mm. The dimensions were almost similar to that of the mandibular permanent first molar teeth, with mesiodistal dimension of 11.0mm and buccolingual width of 10.5mm [18]. Such macrodontias should be diagnosed at an earlier age, as it disrupts the developing occlusion.

Along with the identification of the features and peculiar dimensional variations, supplementing conventional radiography with CBCT to localize the macrodontic premolars and accurately establish its arch relationships, provides with better understanding of the condition [19]. Proper diagnosis depends on the clinician ability to distinguish the morphological characteristics in a 2D radiograph. Decision should be taken as to continue with orthodontic treatment to refine the occlusion, as the increased size presents with a problem. Endodontic treatment should be done with care so as to ensure better prognosis.

4. Conclusion

As described earlier, such cases are extremely rare. Such variations presents with increased risk of diseases and clinician should be aware of the possible problems during its treatment and avoid unwarranted hazards. As it is rightly said that, “the eyes see only what the mind knows”.

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