

Bilateral macrodontia of mandibular second premolars: a case report

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Abstract

Macrodontia is a rare dental anomaly characterized by an excessive enlargement of all tooth structures that generally could be related with some syndromes. Until today, there is a low prevalence of bilateral macrodontia. The present report shows a patient with bilateral macrodontia in mandibular second premolars and with a clear medical history of him and his parents without any syndromes or other dental anomalies. It is important to know macrodontia because the crown shape of teeth is more predisposed to caries and may cause some problems in the occlusion of the patient. By the above, is important to acquire a deeper knowledge about this anatomical variation, as well as must be prepared to perform a carefully treatment of the compromised teeth. The aim of this study was to describe this case with a bilateral rare condition of interest to dentists.

Keywords: dental anomalies, premolars, crown shape, macrodontia, megadontia.

1 Introduction

The aetiology of dental anomalies remains largely unclear (KÜCHLER, RISSO, COSTA et al., 2008), but some anomalies in tooth structure, shape and size results by many factors from disorders during the morphodifferentiation stage of development. (USLU, AKCAM, EVIRGEN et al., 2009; ALTUG-ATAC and ERDEM, 2007; BASDRA, KIOKPASOGLU, STELLZIG, 2000). Identification of specific patterns of associated dental anomalies could be related with certain genetic and environmental factors contributing to different dental anomaly subphenotypes (KÜCHLER, RISSO, COSTA et al., 2008; DUGMORE, 2001).

Some authors have postulated that it is really important to take care with these anomalies because they could create disturbances in maxillary and mandibular arch lengths and occlusions (ALTUG-ATAC and ERDEM, 2007).

Macrodontia (or Megadontia) is a rare dental anomaly (DUGMORE, 2001; ROOTKIN-GRAY and SHEEHY, 2001) characterized by an excessive enlargement of all tooth structures and, in few cases, may be associated with morphological anomalies (GARIB and PECK, 2006; DUGMORE, 2001; O'SULLIVAN, 2000). Such anomaly can be categorized as follows: true generalized (large percentage of dentition), relative generalized (entire dentition), and isolated macrodontia of single tooth (NEMES and ALBERTH, 2006; DUGMORE, 2001). Multiple macrodontia is strange, but it may be associated with some diseases like insulin-resistant diabetes, otodontal syndrome, or facial hemihyperplasia (PEKER and KAYA OGLU, 2009; NEMES and ALBERTH, 2006). Also, generalized macrodontia may be produced by hormonal imbalance, as has been described in pituitary gigantism. (NEMES and ALBERTH, 2006; DUGMORE, 2001). For example, generalized macrodontia is highly related with KBG syndrome (when the syndrome was first described by Herrmann et al. in 1974, they named KBG because the initials of affected families' surnames)

(ALMANDEY, ANTHONAPPA, KING et al., 2010; KUMAR, PRABHU and CAMERON, 2009; BRANCATI, D'AVANZO, DIGILIO et al., 2004; MAEGAWA, LEITE, FÉLIX et al., 2004). Macrodontia of a single tooth is a relatively uncommon condition, and frequently have been reported in mandibular molars or premolars (KUMAR, PRABHU and CAMERON, 2009; NEMES and ALBERTH, 2006). It may affect incisors, third molars and second mandibular premolars. It last, is characterized by excessive enlargement of mesiodistal and faciolingual tooth dimensions with an occlusal crown area increased (GARIB and PECK, 2006). Macrodontia can also be seen in pairs (DUGMORE, 2001). Some authors have described that macrodontia is most frequently found in incisors and canines (ALMANDEY, ANTHONAPPA, KING et al., 2010; DUGMORE, 2001); others reported that are more observed in mandibular second premolars (ROOTKIN-GRAY and SHEEHY, 2001; PEKER and KAYA OGLU, 2009). The prevalence of macrodontia is 1-2% in males (O'SULLIVAN, 2000) and 0,9% in females, but macrodontia of mandibular second premolars affect both sexes equally. In the most of cases macrodontia in mandibular second premolars have been reported in children (DUGMORE, 2001). Altug-Atac and Erdem (2007) reported in their study that macrodontia of maxillary incisor was noted in only 1 female patient and the prevalence of this abnormality in all patients was calculated as 0,03%.

It is important to know Macrodontia because it may cause problems with aesthetics and also with crowding if there is a discrepancy between the dimensions of the teeth and the size of the dental bases (O'SULLIVAN, 2000). Also, these teeth are more predisposed to caries and related with disruption of the developing occlusion by occlusal morphology (DUGMORE, 2001). The aim of this study was to describe this case with a bilateral rare condition of interest to dentists.

2 Case report

A 22-year-old Chilean man (with 1,65 m of height and 56 kg of weight) was attended for a routine dental check up. Extra-oral examination revealed no abnormalities. In the intraoral examination no caries or periodontal disease was noted and the patient presented an Angle class I. However, it was noticed that both mandibular second premolars was enlarged with an abnormal occlusal shape. The patient had no history of pain, gingivitis, trauma, pituitary gigantism or any other syndrome that could be related with this condition. The man and his parents had a clear medical history and the parents had no similar dental anomalies. A full permanent dentition was erupted or developing, including third molars.

Clinically, left mandibular second premolar (tooth 3.5) presented a measure of 8,37 mm bucco-lingually, 9,14 mm mesio-distally and a coronal height of 8,27 mm. The right second premolar (tooth 4.5) was bigger than tooth 3.5 and presented a measure of 10,6 mm bucco-lingually, 10,89 mm mesio-distally and a coronal height of 5,06 mm (no presented complete eruption until the neck). The crown shape of tooth 4.5 had ovoid molariform crown with multiple cusps and an irregular crater with some great fissures (that were sealed) (Figures 1a,b). The crown shape of tooth 3.5 was very similar with the first left deciduous mandibular molar (tooth 7.4) with two pits (that were sealed too) (Figures 2a,b). The patient related too that he left naturally the tooth 7.4 and was sure that the tooth 3.5



Figure 1. Lateral and occlusal view of tooth 4.5 with macrodontia. a) Note the ovoid molariform crown with multiple cusps, and b) an irregular crater with some great fissures (sealed).



Figure 2. Frontal and occlusal view of tooth 3.5 with macrodontia. a) Note the similar shape like tooth 7.4, b) with an enlargement on mesio-distal way.

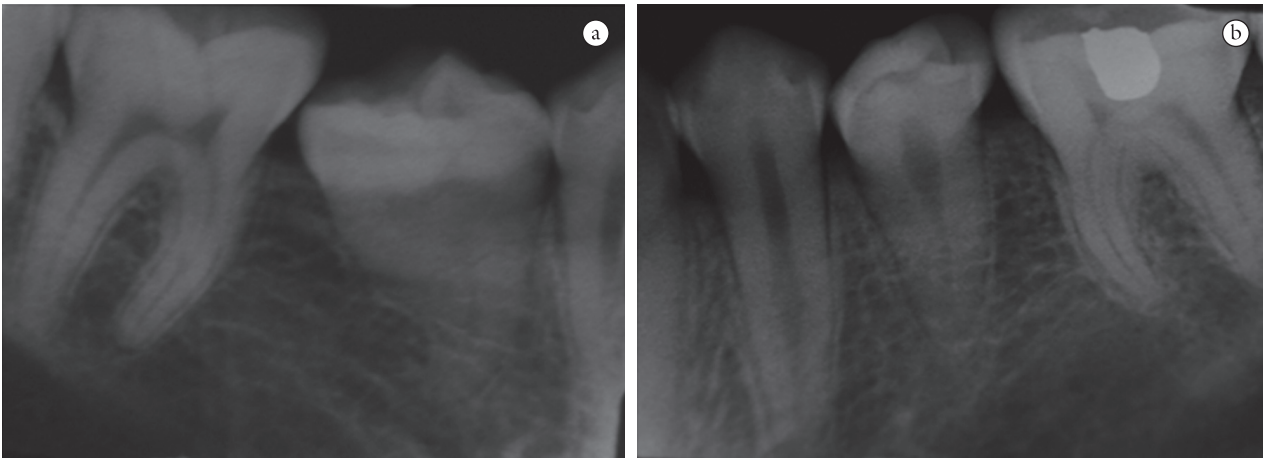


Figure 3. Periapical radiographs showing tooth 4.5 (a) and 3.5 (b). Note the crown with an irregular shape and size of tooth 4.5 (a) if is compared with tooth 3.5 with a normal size and shape but with a reduced root length (b).

was a permanent tooth. To determine the diagnostic of these anomalies a panoramic and two periapicals radiographs were taken.

Radiographically, both mandibular second premolars presented single roots. In the periapical radiograph the tooth 4.5 presented an abnormal size and shape (Figure 3a). Tooth 3.5 was noted with a normal shape and size of crown but with a reduced root length (Figure 3b).

3 Discussion

Dental anomalies, including macrodontia, are caused by complex multifactorial interactions including genetic, epigenetic and environmental factors during the long process of dental development (BROOK, 2009). The patient presented a bilateral macrodontia due to an excessive enlargement of the crown of both mandibular second premolars, in a similar way as the case reported by Dugmore (2001). According to the classification of macrodontia, this case corresponds to an isolated macrodontia. It is uncommon to see localized macrodontia alone, because generally is associated with a syndrome (ALTUG-ATAC and ERDEM, 2007); but the patient and his familiar history not presented any other condition or syndrome.

The mesio-distal size of tooth 3.5 (9.14 mm) was higher than the 7.3 mm for a normal size of second mandibular premolar reported by Sicher and Dubrul (1991), Figún and Garino (2002), but lower to range between 10.6-13.1 mm for macrodontic premolars reported by Dugmore (2001) on this way; however, buco-lingually the tooth 3.5 presented similar measures according to described by Sicher and Dubrul (1991) and Dugmore (2001). Furthermore, tooth 4.5 presented measures buco-lingually (BL: 10.89) and mesio-distally (MD: 10.6) that corresponds to the range described by Dugmore (2001) for macrodonts (BL: 10.6-13.1 mm; MD: 10.7-15.2 mm). Also, the crown shape of tooth 4.5 had ovoid molariform crown with multiple cusps and an irregular crater with some great fissures. The above was important, because the crown shape is more predisposed to caries and may cause some problems in the occlusion of the patient. Finally, Dentistry area professionals should acquire a deeper knowledge about this anatomical variation, as well as

must be prepared to perform a carefully treatment planning previously to intervene a tooth with macrodontia, to avoid unexpected problems during dental treatments procedures generated by ignorance of morphology of this anatomical variation.

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