Macrodontia associated with growth-hormone therapy: a case report and review of the literature

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Abstract

Background Macrodontia is a rare dental anomaly, and isolated macrodontia is even more infrequent. The aim of this article is to report on a young male patient with macrodontia of the mandibular premolars.

Case report We herein present a case report of a young male patient receiving pharmacological growth hormone therapy for 10 years, who was diagnosed with macrodontia of the mandibular premolars. The patient underwent surgical treatment at the School of Dentistry of the University of Buenos Aires and was followed-up for more than 3 years.

Conclusion Macrodontia is a rare condition. Early diagnosis and treatment of this anomaly favors adequate formation of the dental arches. In the light of this case report, a review of paediatric patients who received growth hormone therapy during the tooth formation stage would seem relevant.

KEYWORD Dental anomalies, Macrodontia, Megalodontia, Molarization.

Introduction

Macrodontia, also known as megalodontia is a developmental dental anomaly causing the teeth to be larger than average size. It can affect a single tooth or all maxillary and mandibular teeth, in which case it is termed generalised macrodontia [Dugmore, 2001]. The reported prevalence in permanent teeth ranges from 0.03 to 1.9% [Canoglu et al., 2012], and mostly affects incisors and canines [Dugmore, 2001]. Macrodontia of premolars, often termed molarisation, is an extremely rare condition [Acharya et al., 2015]. It has no sex predilection, and the male to female ratio is 1:1. It mostly affects individuals aged 8 to 13 years [Canoglu et al., 2011]. Since macrodontia is an asymptomatic pathology, it is usually diagnosed following radiographic studies performed to investigate the cause of lack of eruption of a permanent tooth. Macrodontia has been reported in both erupted [Pace et al., 2013] and impacted [Okuno and Tanaka, 2017] teeth. Although its aetiopathogenesis remains unclear, genetic and acquired factors may play a role in the onset of this anomaly [Küchler et al., 2008; Acharya et al., 2015]. Medical conditions such as insulin-resistant diabetes, otodental syndrome, hemifacial hyperplasia, and hypophsyal gigantism have been associated with generalised macrodontia [Dugmore, 2001; Acharya et al., 2015]. Unlike the latter, there are no reports in the literature associating localised macrodontia with systemic conditions. Depending on the size and morphology of the affected teeth, macrodontia can cause functional and/or aesthetic problems, so that early treatment and diagnosis are essential to allow adequate formation of the dental arches [Okuno and Tanaka, 2017].
Extraction of tooth 4.5, maintaining the deciduous tooth.

**FIG. 5**

54% larger than the mean size reported for the same teeth, the case shown here, the size of the macrodont premolars was made on plaster casts [Hermel et al., 1968; Lunt, 1976; Reichart et al., 1977; Peck et al., 1983; Groper, 1987; Chase, 1994; Canut and Arias, 1999; Rootkin-Gray and Sheehy, 2001; Dugmore, 2001; Dadpe et al., 2010; Fuentes and Borie, 2011; Canoglu et al., 2011; Kyriazidou et al., 2013; Pace et al., 2013; Acharya et al., 2015; Okuno and Tanaka, 2017]. Molarisation of the second premolars is usually bilateral, and only two cases of macrodontia of a single premolar have been reported in the literature [Reichart et al., 1977; Groper, 1987]. Unlike generalised macrodontia, isolated macrodontia has not been associated with syndromes and pathologies [Pace et al., 2017]. In the case report presented here, the patient had received hormonal replacement therapy with somatotropin for more than ten years. This growth-hormone stimulates cell reproduction and regeneration. The cases of macrodontia of a single premolar reported in the literature were not associated with pharmacological growth-hormone therapy in a nonsyndromic patient. This is the first case report showing a possible relationship between molarisation of a premolar and growth-hormone therapy. Isolated macrodontia can occur in both in impacted [Primack, 1967; Reichart et al., 1977; Peck et al., 1983; Groper, 1987; Rootkin-Gray and Sheehy, 2001; Canoglu et al., 2001; Kyriazidou et al., 2013; Acharya et al., 2015; Okuno and Tanaka, 2017] and erupted teeth [Hermel et al., 1968; Lunt, 1976; Chase, 1994; Canut and Arias, 1999; Dugmore, 2001; Dadpe et al., 2010; Fuentes and Borie, 2011; Pace et al., 2013; Acharya et al., 2015].

There is no consensus regarding the size of macrodont teeth, mainly due to differences in the measurement methods employed. The latter include simple radiographs [Primack, 1967; Groper, 1987; Dadpe et al., 2010]; measurements made on plaster casts [Hermel et al., 1968; Lunt, 1976]; direct measurement of erupted or extracted macrodont teeth [Acharya et al., 2015; Okuno and Tanaka, 2017]; and, more recently, computed cone beam tomography [Canoglu et al., 2012]. In the case shown here, the size of the macrodont premolars was 51% larger than the mean size reported for the same teeth, considering that the mesiodistal size of a mandibular second premolar is 7.3 mm. Dental anomalies require an interdisciplinary treatment approach. Careful consideration must be given to whether the macrodont tooth can be maintained in the dental arch despite its disproportionate size and altered anatomy. The combination of surgery and orthodontics is the most frequent treatment of choice [Groper, 1987; Rootkin-Gray and Sheehy, 2001; Dugmore, 2001; Canoglu et al., 2012; Kyriazidou et al., 2013; Pace et al., 2013].

**Conclusion**

Macrodontia is an extremely rare condition [Dugmore, 2001]. It would seem relevant to conduct a review of paediatric patients who received growth hormone therapy during the tooth formation stage. Early diagnosis and treatment of this anomaly favors adequate formation of the dental arches.

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**References**