Agenesis of all third molars in two half siblings

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Abstract

Tooth agenesis is one of the most common dental anomalies and is influenced by factors including patient genetics. Although there are several specific genes associated with certain patterns of agenesis, there does not seem to be a genetic pattern identified to date that is associated with isolated complete third molar agenesis. This report presents two half-siblings who both express complete agenesis of third molars despite the fact that their shared parent does not express the same phenotype. The case discussion focuses on addressing the potential genetic possibilities including autosomal dominant inheritance and variable expressivity of a mutation. There remains an uncertainty to the exact gene involved. Potential options include WNT10A and PAX9. The affected individuals are not needing extractions or experiencing complications due to the presence of third molars. However, the concern remains that there is the potential for more severe expression of the mutation in future generations.

Introduction

The agenesis of teeth has been continuously reported as one of the most common dental abnormalities in humans. The classifications of missing teeth are in three categories: hypodontia is defined as missing one to six teeth, oligodontia meaning missing more than six teeth, and anodontia missing all teeth. The definitions of both hypodontia and oligodontia, however, exclude third molars (commonly known as wisdom teeth). The agenesis of third molars is a very common, if not the most common, pattern of tooth agenesis [1]. Many genes have been associated with tooth development [2]. Certain genes, including PAX9, MSXI, AXIN2, EDA, EDAR, EDARADD, and WNT10A have been associated with specific patterns of tooth loss. However, most instances of tooth agenesis are not associated with any of these genes. PAX9 has been associated with third molar agenesis, but no coding mutations in that gene have been identified that explain isolated third molar agenesis [3]. This report describes a case of third molar agenesis between two half-siblings followed by a discussion of potential genetic influence.

Case Report

A 24-year old Caucasian female reported to the University of Pittsburgh School of Dental Medicine for routine care. Upon taking radiographs, it was observed that her third molars were not present. The patient reported that her third molars were not extracted and had never erupted. When asked further, the patient stated that her half-brother, 15 years old, was also missing all of his third molars, and that all parents of the siblings had at least two wisdom teeth. Regarding the pedigree (Figure 1), the only information that could be completed was of the immediate parents. Individual 2.5, the mother of individual 3.4, had two wisdom teeth, both in the maxillary arch and fully erupted. Individual 2.3, the mother of individual 3.3, had all four wisdom teeth removed. Individual 2.4, the father of both individuals 3.3 and 3.4, had three third molars removed. No known genetic testing for any individuals in the family regarding tooth agenesis has been completed. It should be noted that individual 3.3 is missing his maxillary first premolars as well, but the-
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cerned for the future generations, unless there is also an association with impairment of overall health.

References


