

## Triad of Bilateral Duplicated Permanent Teeth, Persistent Open Apex, and Tooth Malformation: A Case Report

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### Abstract

**Aim:** The aim of this article is to report a case of bilateral multiple impacted supernumerary teeth. A discussion of possible mechanisms of development is also presented along with a concise review of the literature.

**Background:** Supernumerary teeth occur in the context of various scenarios in the primary and the permanent dentition. Multiple supernumerary teeth are a rare finding especially in the absence of associated syndrome or disease.

**Report:** A case of bilateral multiple impacted supernumerary teeth localized to the mandibular premolar region is reported. Some of the supernumerary teeth as well as the erupted premolars had persistent open apices. Coronal malformation of the right maxillary first premolar was another interesting finding. There was an absence of any concomitant disease.

**Summary:** The aforementioned combination of findings has not been reported previously. The anatomical, geometrical, and spatial relationships of supernumerary teeth with their erupted equivalents may shed light on some controversial aspects of the etiology.

**Keywords:** Supernumerary teeth, open apex, tooth malformation, non-syndrome

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## Introduction

A supernumerary tooth is additional to the normal complement of teeth in either a primary or permanent dentition and may be encountered in various regions of dental arches. These teeth are present in 0.8% of primary dentitions and in 2.1% of permanent dentitions.<sup>1</sup> While there is no sex predilection for supernumerary teeth in the primary dentition, males are affected twice as often as females in the permanent dentition.<sup>2</sup>

These teeth may be single or multiple, unilateral or bilateral, erupted or impacted, and in one or both jaws. Although multiple supernumerary teeth have been rarely reported,<sup>3,5</sup> their occurrence without any concomitant syndrome or disease is a more rare finding.<sup>6,7</sup> The syndromes most commonly associated with supernumerary teeth include cleft lip and palate,<sup>8</sup> Gardner's syndrome,<sup>9</sup> and cleidocranial dysostosis.<sup>10</sup> The majority of non-syndrome cases of multiple supernumerary teeth occur in the mandible and especially in the mandibular anterior region.<sup>7</sup> The present report describes a young female patient with a triad of bilateral impacted supernumerary teeth with persistent open apices and individual tooth malformation.

## Case Report

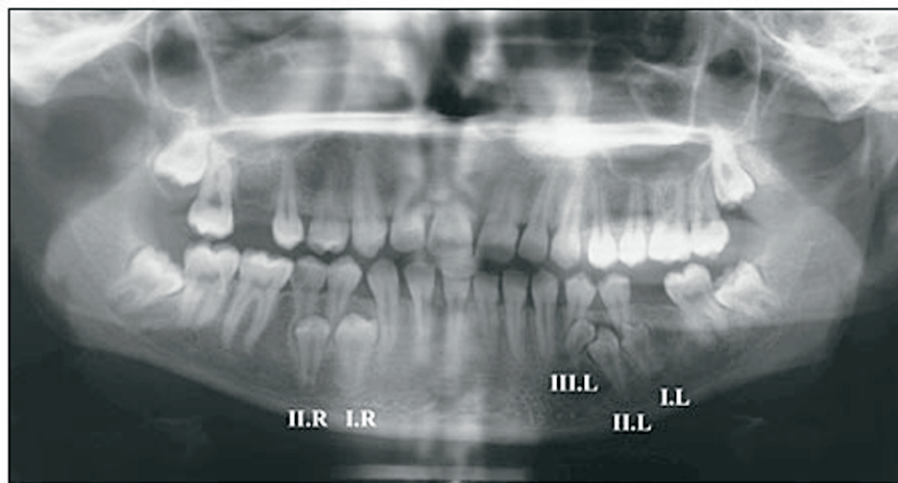
### Diagnosis

A 13-year-old female patient presented at the School of Dentistry at Tabriz University of Medical Sciences in East Azarbaijan, Iran with a chief

complaint of "severe pain in the right side of the lower jaw." Clinical examination revealed a permanent mandibular right second premolar with severe dental caries on the distal aspect of the tooth. The tooth responded positively to the cold and hot sensitivity testing followed by intense pain lasting approximately 30-40 seconds. Her medical and dental histories were otherwise unremarkable, and the patient was in good health. Physical examination did not reveal any abnormalities.

On routine radiographic examination, several bizarre findings were identified. The patient had five impacted supernumerary teeth in the mandible; three of them were localized to an area corresponding to the left mandibular premolars and the rest were impacted in the contralateral equivalent side (Figure 1).

The morphology, size, and axial orientation of the analogous posterior teeth on both sides (teeth I.L and I.R) were nearly identical. A prominent feature of these teeth was a persistent open apex. The same property was observed in the erupted left and right second premolars. Axial rotation toward the mesial was evident in the adjacent anterior teeth (II.L and II.R) despite the uniformity of morphology with the erupted first premolars. Both teeth had completely formed roots. The follicular space around these teeth was enlarged. The anterior teeth on the left side (III.L) were smaller than other impacted teeth. A small



**Figure 1.** Panoramic view of the dentition. Note the bilateral mandibular supernumerary teeth and malformed right maxillary first premolar (L: left, R: right).

portion of its root was formed. The axial orientation of this tooth was approximately parallel to the left mandibular first premolar. Another interesting finding was the malformation of the right maxillary first premolar. Occlusal morphology of this tooth exhibited a marked deviation from normal, and its mesiodistal width was significantly greater than the left maxillary first premolar.

Clinical and radiographic assessment of her parents and sister failed to reveal a similar finding.

### **Treatment**

In the absence of any other compelling factors periodic monitoring of these teeth is preferred to surgical removal. In the present case the decision was made to retain these teeth and perform periodic follow-ups.

### **Discussion**

Even though the exact etiology of supernumerary teeth is not known, several hypotheses have been proposed. The phylogenetic theory of atavism (evolutionary throwback) is one of the speculated pathways suggested by some authors to explain their development.<sup>11</sup> However, ectopic development and solitary occurrence present a serious hurdle to this theory.<sup>12</sup> According to the dichotomy theory, the cleavage of a single tooth bud to two homologous or heterologous parts is the key event underlying the creation of supernumeraries.<sup>13</sup> The implication is the dichotomized tooth bud may be the origin of two equal teeth or a normal and a dysmorphic tooth. The most widely accepted mechanism is the hyperactivity theory indicating supernumeraries are the result of localized, independent, and conditional hyperactivity of dental lamina.<sup>14,15</sup> Heredity seems to play a role in this phenomenon but not through a simple Mendelian pattern. To be more precise, a combination of environmental factors and genetics may lead to hyperactivity of dental lamina and the cascade of events which follow.<sup>16</sup>

Supernumerary teeth are classified according to morphology and location. In the primary dentition, the morphology of these teeth may be normal or conical. Nonetheless, in the permanent dentition the morphology exhibits more diversity and may be categorized as: conical (a small peg-shaped tooth), tuberculate (barrel-shaped with incomplete root formation and often paired), supplemental

(duplicated tooth, located at the end of a tooth series and seldom impacted), or odontoma (hamartomatous malformation).<sup>17,18</sup> Various classes of supernumerary teeth are based on their location and include the mesiodens, paramolar, and distomolar. In the present case supernumeraries are of the tuberculate type with characteristic bilateral development and incomplete root formation.

Supernumerary teeth may be associated with the following clinical problems:

- Failure of eruption
- Displacement or rotation of permanent teeth
- Crowding
- Abnormal diastema or premature space closure
- Dilaceration, delayed or abnormal root development of the permanent teeth
- Cystic formation
- Eruption into the nasal cavity
- A jeopardizing alveolar bone graft in patient with a cleft lip/plate
- Compromised implant site preparation

In the present case the bilateral displacement of the mandibular canine and first premolar along with diastema formation are evident. The existence of these teeth may compromise future placement of implants.

- Delayed eruption or displacement
- Associated pathology
- Impediment to orthodontic alignment of permanent teeth
- Compromised alveolar bone grafting or implant placement
- Spontaneous eruption

Since none of these conditions existed the present case was monitored and extractions were not performed.

### **Summary**

The present clinical scenario has not been reported previously. Considering the symmetrical bilateral development it may be concluded other factors are involved in the development of supernumerary teeth in addition to localized hyperactivity of dental lamina. The clinical features of the present triad may be diverse manifestations of a single mutation and might serve as a defensible hypothesis.

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