

# Multiple Supernumerary Teeth in a Nonsyndromic 11-year-old Boy

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## ABSTRACT

**Introduction:** The maximum incidence of supernumerary teeth is in the maxillary anterior region. They are classified based on their type and location. Their occurrence can lead to several clinical issues. Hence, identification and management of these teeth is very important for a future healthy, well-aligned dentition.

**Case report:** An 11-year-old male patient reported to the Pediatric and Preventive Dentistry outpatient department (OPD), Royal Dental College, Palakkad, with extreme irregularities of maxillary anterior segment, which led to a comprehensive investigation with cone beam computed tomography (CBCT). The CBCT revealed the presence of complex odontoma, fused supernumerary tooth, unerupted 21 and palatally erupted 22.

Patient was advised surgical removal of unerupted supernumerary and odontoma followed by orthodontic alignment of permanent teeth.

**Conclusion:** A thorough understanding about the etiology, investigations, and associated complications caused by supernumerary teeth helps the dental surgeon to arrive at a specific treatment plan so as to provide optimal treatment for each patient presenting with supernumerary teeth.

**Keywords:** Maxillary anterior segment, Odontome, Supernumerary teeth.

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## INTRODUCTION

Supernumerary teeth are those teeth that are present in excess of the normal sequence and were first described between 23 and 79 AD.<sup>1</sup>

A supernumerary tooth can be defined as one that is additional to the normal series.<sup>2</sup>

Supernumerary teeth are common in the Mongoloids with a frequency of more than 3%.<sup>3,4</sup>

Koch et al<sup>5</sup> stated that the frequency of supernumerary teeth in the permanent dentition is 1 to 3% and in primary dentition, according to Primosch,<sup>6</sup> it is 0.3 to 0.6%. The incidence of supernumerary teeth as proposed by Mitchell<sup>7</sup> was 2:1 in favor of males. Supernumerary teeth are estimated to be 8.2 times more prevalent in the maxilla than in the mandible<sup>8-10</sup> and commonly affect the premaxillary segment.<sup>11</sup> Multiple supernumerary teeth are more seen in the mandibular premolar region.<sup>12</sup>

Both environmental and genetic factors play a role in the etiology of supernumerary teeth.<sup>12</sup> The theories put forward are:

**Atavism theory:** This theory suggests that supernumerary teeth are the results of phylogenetic reversion to extinct primates with three pairs of incisors.<sup>6</sup>

**Dichotomy theory:** Here, the tooth germ divides into two equal or different-sized parts, resulting in the formation of two teeth of equal size, or one normal and one dysmorphic tooth.<sup>11</sup>

**Dental lamina hyperactivity theory:** This theory suggests that a rudimentary form would develop from the proliferation of epithelial remnants of the dental lamina, whereas a supplemental form would develop from the lingual extension of an accessory tooth germ.<sup>6</sup> This is the most accepted theory.

**Classification:** Supernumerary teeth can be classified according to their morphology, number, and location. They can be rudimentary or supplementary, single or multiple and mesiodens, paramolar, and distomolar. Classification by Kalra et al<sup>13</sup> (Flow Chart 1).

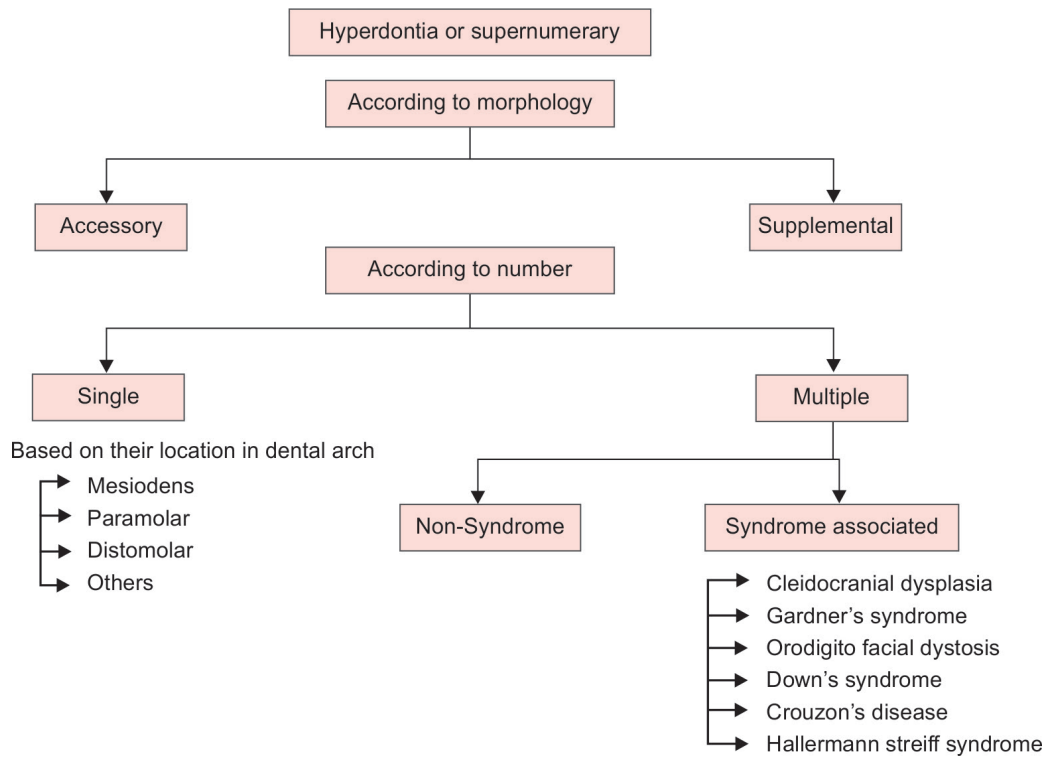
Associated complications can be prevention or delay of eruption of associated permanent teeth, crowding/malocclusion,<sup>12</sup> incomplete space closure during orthodontic treatment,<sup>14</sup> delayed or abnormal root development of associated permanent teeth, root resorption of adjacent teeth,<sup>8,15-17</sup> cyst formation,<sup>8,15,16</sup> and late forming supernumerary teeth.<sup>18</sup> They can also compromise the esthetics, complicate alveolar bone grafting, impinge on nerves leading to paresthesia and/or pain.<sup>2</sup> The most common developmental disorders that show an association with multiple supernumerary teeth are cleft lip and palate, cleidocranial dysostosis,<sup>2</sup> and Gardner's syndrome.<sup>11</sup> Other associated syndromes include Fabry-Anderson syndrome or chondroectodermal dysplasia, Rothmund-Thompson syndrome, and Nance-Horan syndrome.<sup>15</sup>

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**Flow Chart 1:** Classification of supernumerary teeth by Kalra et al<sup>13</sup>



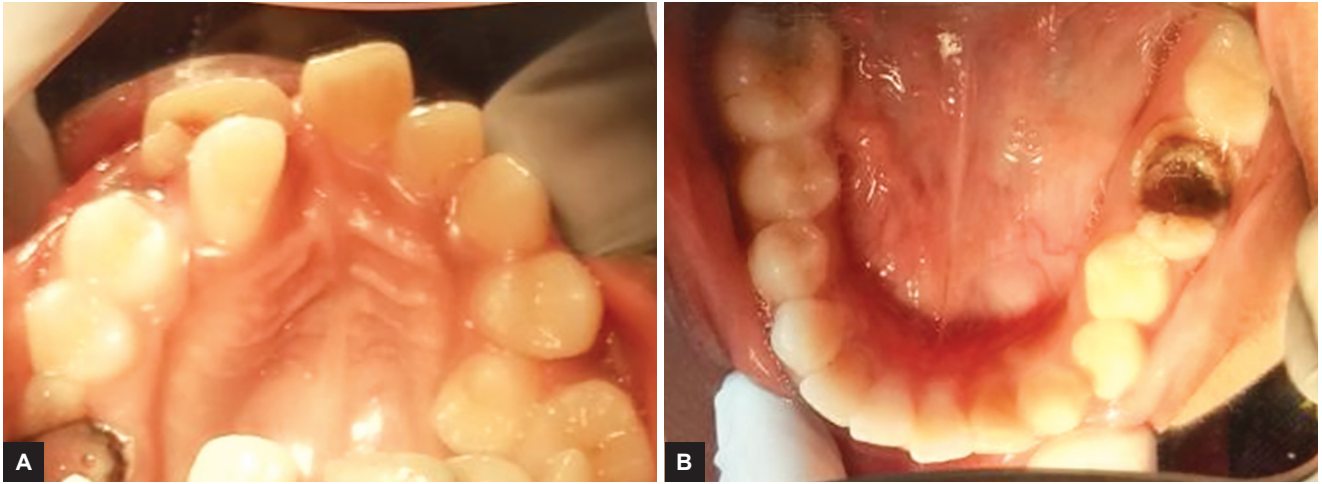
**Fig. 1:** 21 macrodontia

An 11-year-old male patient reported to the Department of Pediatric Dentistry, Royal Dental College, Palakkad, with a chief complaint of marked irregularity of upper front teeth since few years. Esthetics was the main concern for reporting to the Pediatric dental OPD. Patient had a noncontributory medical history as well as no extraoral findings.

On intraoral examination, 21 seemed to show macrodontia (Fig. 1), 22 was erupted more toward the palate (Fig. 2), and a hard swelling was seen in the second quadrant adjacent to 22. Patient also had maxillary anterior segment crowding and deep dentinal caries involving



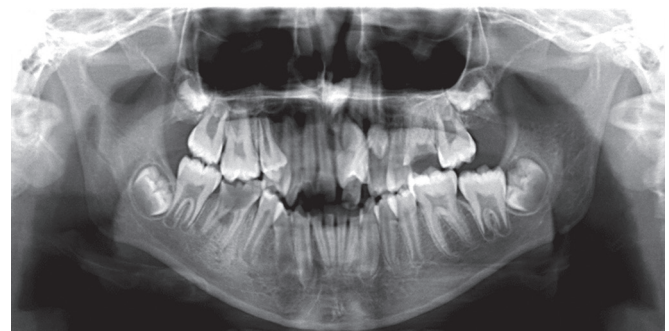
**Figs 2A and B:** 22 erupted more toward the palate



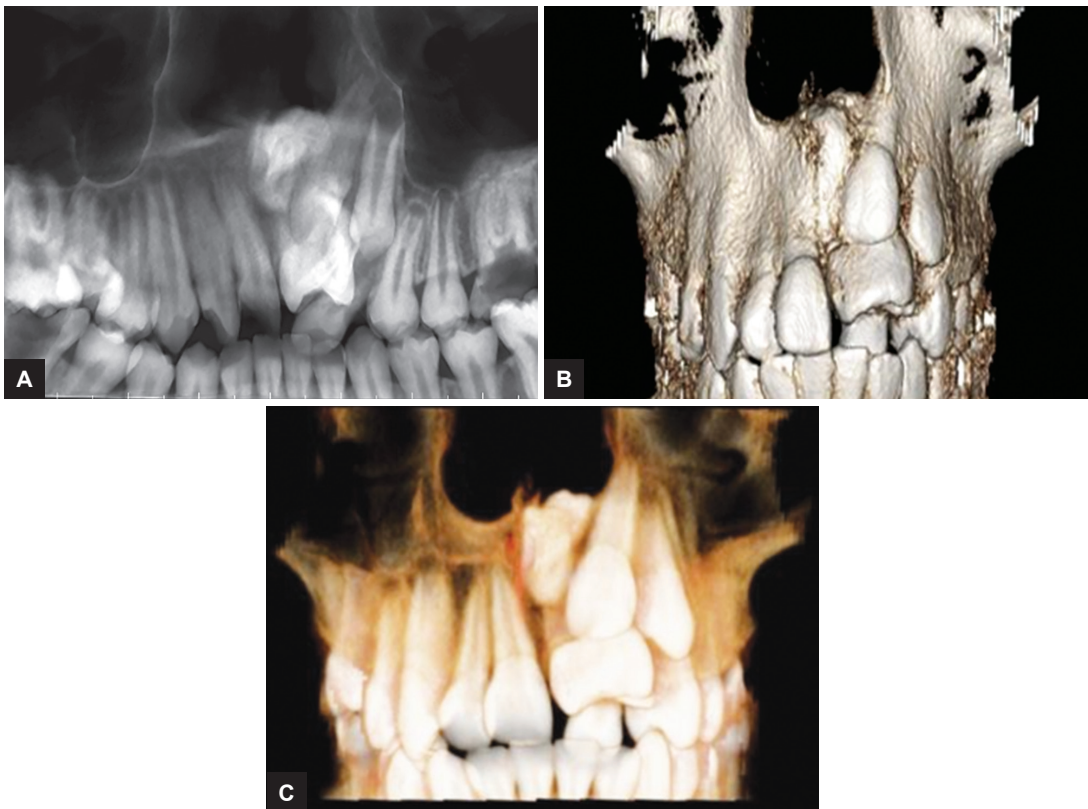
**Figs 3A and B:** Maxillary anterior segment crowding and deep dental caries involving pulp in relation to 26 and 46

pulp in relation to 26 and 46 (Fig. 3). Investigations: Patient was advised an orthopantomogram first and the findings were as follows.

Panoramic findings (Fig. 4) revealed maxillary anterior segment crowding and dental caries involving pulp in 26 and 46. The CBCT revealed (Fig. 5) the presence of (1) impacted complex odontoma, (2) supernumerary fused tooth, (3) impacted teeth 21, and (4) palatally erupted tooth 22. Later, a CBCT was advised owing to the severity of the situation to locate the exact relationship of supernumeraries to the normal teeth.



**Fig. 4:** Panoramic radiograph reveals maxillary anterior segment crowding and dental caries involving pulp in 26 and 46



**Figs 5A to C:** CBCT reveals impacted complex odontoma, supernumerary fused tooth, impacted teeth 21, and palatally erupted tooth 22

The findings were as follows: The impacted odontome could be described as a well-defined mixed hyperdense ovoid structure of size 13.6 mm (A–P) × 7.8 mm (M–D) × 16.3 mm (S–I), with densities similar to enamel and dentin, which is situated within the anterior maxillary basal bone, slightly left of the anterior nasal spine, apical to the root apex of tooth,<sup>12</sup> also protruding into the floor of nasal cavity without any perforation, and causing expansion of labial cortical plate without perforation.

The distal surface that closely contacts the mesial surface of crown of tooth 21 from nasopalatine canal is 1.5 mm and that from occlusal plane is 17.0 mm. The supernumerary fused tooth was a well-defined tooth-like hyperdense structure of size 22.7 mm (incisoapical) × 13.4 mm, (mesiodistal) × 10.2 mm (labiopalatal) which is situated within the anterior maxillary alveolus, distal to the tooth 11, palatal to the impacted odontome and unerupted tooth 21, labial to the palatally erupted tooth 22. It vaguely resembles a maxillary central incisor, with an accessory lingual cusp, along with single bulbous root.

Internal anatomy reveals three separate root canals that join to form a single wide canal that ends in an open apex. The presence of enamel-lined canal within the crown and root resembling dens invaginatus was noted. It causes expansion and perforation of overlying labial cortical plate. Distance from the nasopalatine canal is 1.9 mm and that from the occlusal plane is 2.9 mm. The findings suggest a fusion of three supernumerary mesiodens, two labially and one palatally, resulting in a large crown with bulbous root.

Impacted 21 could be seen situated labial to impacted supernumerary fused tooth, causing thinning and perforation of overlying labial cortical plate. The 22 was situated palatal to impacted supernumerary fused tooth, causing thinning and perforation of overlying palatal cortical plate. Distal dilacerations of root of 22 could be noted.

So, the impression was impacted complex odontoma, supernumerary fused tooth, unerupted 21, and palatally erupted 22.

Management/prognosis: Treatment depends on the position and type of the supernumerary tooth and on its effect or possible outcomes on adjacent teeth.

Rotberg and Kopel<sup>19</sup> recommended immediate extraction of the supernumerary teeth and preferably before the age of 5 years so that the root formation is incomplete in related permanent incisors.

According to Koch,<sup>5</sup> an urgent removal of supernumerary teeth is not required if no pathology is present.

Högström and Andersson<sup>20</sup> suggested removal of the supernumerary as soon as it has been diagnosed. In a young child, this could form dental phobia and can also cause devitalization or deformation of adjacent dentition. Also, until the root development of the adjacent dentition is complete, the supernumerary could be left untreated.

The probable drawbacks related to this plan comprise loss of space, loss of eruptive force of adjacent teeth, and also crowding of the affected arch. Decision support system: Considering different controversies regarding management of supernumerary teeth, Amarlal and Muthu<sup>21</sup> put forward the decision supporting system. The goal of the decision support system (Flow Chart 2) was to assist the clinician with diagnosis and treatment planning.

According to this decision support system, erupted supernumerary teeth should be preferentially removed apart from cases where the supernumerary teeth need to be retained and unerupted teeth can be related with complications and without complications. Unerupted teeth without complications should be followed up periodically in accordance with Garvey et al<sup>2</sup> and those associated with any complications should be surgically removed.

According to Stermer Beyer Olsen et al,<sup>22</sup> if the supernumerary tooth is placed close to the apices of the developing successors, surgical removal can be delayed and also if the formation of the supernumerary teeth is in the initial stages, resulting in chances of recurrence which is in accordance with de Oliveira Gomes et al.<sup>23</sup>

Clinical implications: Often, clinical intervention is required in case of supernumerary teeth that affect the normal position and eruption of adjacent teeth.<sup>24</sup> The failure of eruption of maxillary incisors is considered the most common complication.<sup>10</sup>

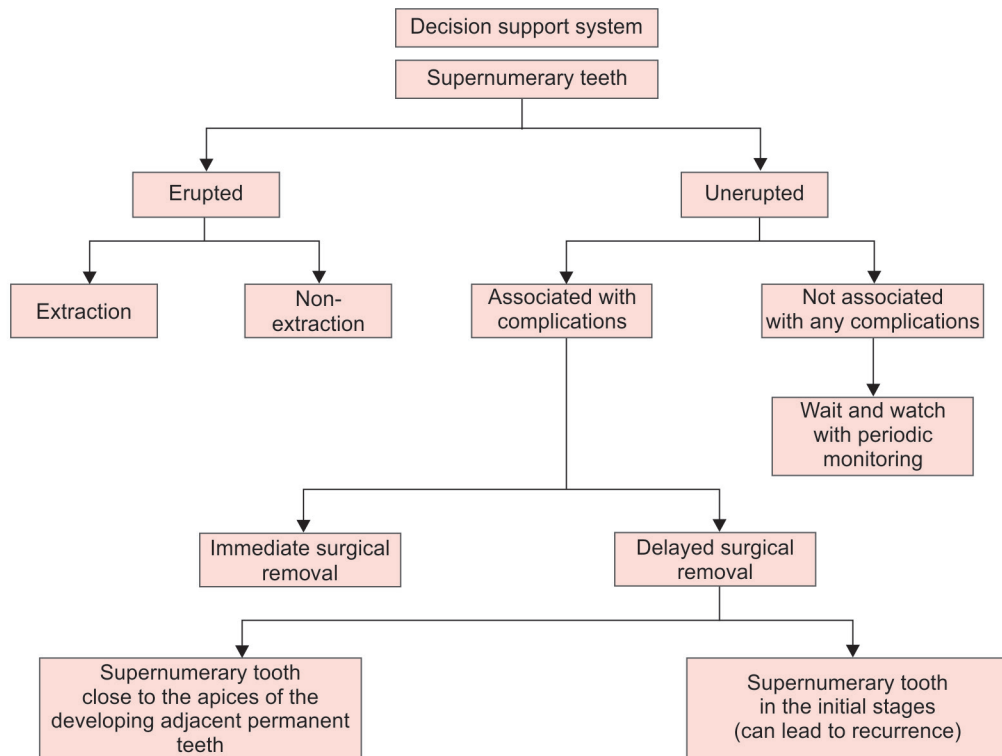
In this case, the supernumerary teeth in the anterior region affected the normal position of lateral incisor and failure of eruption of upper left central incisor as well as upper anterior crowding. A distal dilacerations of 22 is also evident.

It may also cause root deformities of permanent anteriors, such as resorption and ankylosis, if proper treatment has not been rendered.<sup>12</sup> Various treatment protocols for managing crowding or impaction related to supernumerary tooth are: (a) Removal of supernumerary teeth and bone overlying impacted teeth, (b) incision of fibrous tissue over the alveolar ridge to promote the eruption with or without orthodontic traction, and (c) removal of supernumerary teeth or tooth only.<sup>25,26</sup>

Spontaneous eruption of impacted maxillary incisors takes place in 54 to 76% of cases when there is enough space in the dental arch and supernumerary tooth is extracted.<sup>2,27</sup> The optimum time for surgical extraction of a supernumerary tooth is highly controversial.

One school of thought is that immediate removal after finding of supernumerary teeth results in spontaneous correction of an existing malocclusion. The impacted incisors erupt spontaneously into their usual position, thus preventing midline spacing and deviation.<sup>28</sup> The disadvantages of this approach include damage to adjacent

**Flow Chart 2:** Decision support system for management of supernumerary teeth designed by Amaral and Muthu<sup>21</sup>



\* In cases of adjacent tooth congenitally missing, in cases where the supernumerary tooth is required as an abutment, reshaping of mesiodens when the primary incisor is lost prematurely and permanent incisor not yet erupted.

dentition resulting in ankylosis and displacement and delayed eruption of permanent teeth.

The second school of thought is delayed removal of supernumerary teeth,<sup>28</sup> upon apical maturation of permanent incisors at the age of around 8 to 10 years, when the behavior of child is much easier to manage. Then, the type of anesthesia can be less invasive and intra- and postoperative complications are less likely to occur. The disadvantages associated with the delay in surgical intervention are loss of eruptive potential of incisors, loss of anterior arch space, or midline shift, indicating the call for more rigorous surgical and orthodontic treatment.

A combination of surgical and orthodontic treatment is recommended if diagnosis of the impacted tooth is at a later stage with root completion or if present in the unfavorable position. Treatment of complex odontome in most of the cases is surgical extraction and curative. Nevertheless, periodic examination is compulsory to evaluate healing and recurrence, if any.<sup>29</sup> In this case, the overlying odontomes should be removed by a conservative surgery under local anesthesia.<sup>30</sup>

Care must be taken while performing surgery, so as to protect the maxillary sinus and to avoid the nasal floor perforations. If early extirpation of odontome is done without disturbing the underlying tooth germ, the eruption of the impacted teeth can be anticipated

spontaneously or after orthodontic traction.<sup>31,32</sup> If the eruption does not happen within 2 to 3 months, suspended ligature wire hook can be used for orthodontic traction with no requirement for repeated flap reflection.<sup>33</sup> Palatally erupted lateral incisor can be corrected by fixed orthodontic treatment along with the active eruption of upper left unerupted central incisor. The success of the orthodontic alignment depends on the degree of root completion, the position and direction of the impacted tooth, the degree of dilacerations, and the presence of space of impacted tooth.<sup>34</sup>

**CONCLUSION**

Surgical extraction of the supernumerary teeth is advised if the adjacent tooth eruption is impeded, altered, or displacement or pathologies, such as cysts and resorption have occurred. If the complications of surgery outweigh the benefits of extraction, the teeth may be left *in situ* and a regular patient follow-up should be done even after the removal of supernumerary teeth to determine whether further teeth are forming.<sup>35</sup>

A thorough understanding about the etiology, investigation, associated complications caused by supernumerary teeth and different treatment modalities helps the dental surgeon to give the patient favorable treatment options and thus manage the patient atraumatically.

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