

Case Report



Multidisciplinary treatment approach to unerupted permanent incisor tooth and associated dental anomalies: case reports series

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Abstract

Background: Supernumerary teeth, which are defined as any tooth or odontogenic structure formed from tooth germ in excess of the usual number for any given region of the dental arch, is a developmental anomaly encountered in pediatric clinical practice. This case report series presents the multidisciplinary treatment approach applied to three different patients with anterior maxillary supernumerary teeth.

Case Series: Case 1: An 11-year-old male patient was treated with surgical and orthodontic interventions due to the delayed eruption of the supernumerary tooth in the maxillary anterior region. Case 2: It was determined that the unaesthetic appearance in the maxillary anterior region of a 10-year-old female patient was caused by supernumerary teeth. The supernumerary teeth were extracted and the unerupted teeth were treated by orthodontic intervention. Case 3: In a 9-year-old male patient, it was determined that the reason for the delayed exfoliation of the primary teeth in the maxillary anterior region was supernumerary teeth. The patient was treated with surgery and orthodontic intervention.

Results: Spontaneous eruption of permanent central teeth may last for up to three years. Orthodontic treatment may be required to ensure the even alignment of the erupting teeth. The teeth can be monitored for spontaneous eruption if there is ongoing root development, although orthodontic treatment will be necessary if the root development has already been completed, as such teeth have no chance of spontaneous eruption

Conclusion: Early diagnosis of delayed eruption of permanent successors is necessary to avoid many dental complications. The management of such cases should be designed by a multidisciplinary team as there is no definitive time to surgically remove unerupted supernumerary teeth.

Keywords: Supernumerary teeth, Surgical extraction, Orthodontic intervention

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Introduction

Supernumerary teeth, which are defined as any tooth or odontogenic structure formed from tooth germ in excess of the usual number for any given region of the dental arch, is a developmental anomaly encountered in pediatric clinical practice.¹ The prevalence of supernumerary teeth is 0.3%–0.8% in primary dentition and 1.5–3.5% in permanent dentition.¹ A greater prevalence of supernumerary tooth formation is reported in males than in females.² Supernumerary teeth may be single or multiple, unilateral or bilateral, erupted or impacted, or in the lower or upper jaw.³ Supernumerary teeth can be asymptomatic and incidentally detected upon radiological examination.⁴ Supernumerary teeth can occur in any region of the dental arch, but the most common site is the maxillary anterior segment.⁵ Supernumerary teeth may cause esthetic and functional problems, with the most common complications being eruption anomalies,

rotations or displacements of adjacent teeth, dilatations, root resorption, crowding, malocclusion, formation of fistulae and cysts, and delayed or abnormally developed roots in permanent teeth.⁶ This case series present the multidisciplinary treatment approach applied to three different patients with anterior maxillary supernumerary teeth. Consent forms were obtained from all patients and their legal guardians.

Case Reports

Case 1

An 11-year-old male patient presented with a delayed eruption of tooth number 11. The patient was in good systemic health, and an oral examination revealed an eruption of tooth number 21 in the anterior maxilla (Figure 1A). Clinical and radiographic examination revealed two anterior maxillary supernumerary teeth located in the palatal area, as well as two supernumerary



canine teeth in the right and left sides of the mandible (Figure 1B). The decision was made to extract the anterior maxillary supernumerary teeth, and to regularly control the mandibular supernumerary teeth after consultation with a surgeon. Following anesthesia for the extraction of the maxillary supernumerary teeth, a full-thickness palatal flap was done apically (Figure 1C). The teeth were extracted and the flap was put back in place and sutured for primary healing to begin. After one week, the sutures of the patient were removed, and impressions were taken for a pediatric prosthesis. The planned pediatric prostheses were a C clasp for maxillary primary canine teeth and an Adams clasp for the maxillary 1st permanent molars. In addition, the artificial maxillary right incisor was taken and trimmed to the appropriate size and placed on the edentulous area. At the next visit, the patient was informed

about the use of the pediatric prosthesis and was advised to use it on a regular basis (Figure 1D). It was explained that it should only be taken off at night while sleeping and that it should be used at all other times of the day. A recall visit was scheduled for two months later. The patient used the pediatric prosthesis for two months. No change in the position of the right maxillary central incisor was noted at the recall visit two months later, so the department of orthodontics was consulted. The consultation resulted in the planning of the distalization of the impacted maxillary lateral incisors and the orthodontic traction of tooth 11 by surgically opening a window, inserting a button into the right maxillary central incisor and modifying the pediatric prosthesis (Figures 1E and 1F). For the modification of the pediatric prosthesis, C clasps applied to the canine teeth were used. For the distalization of the lateral teeth,

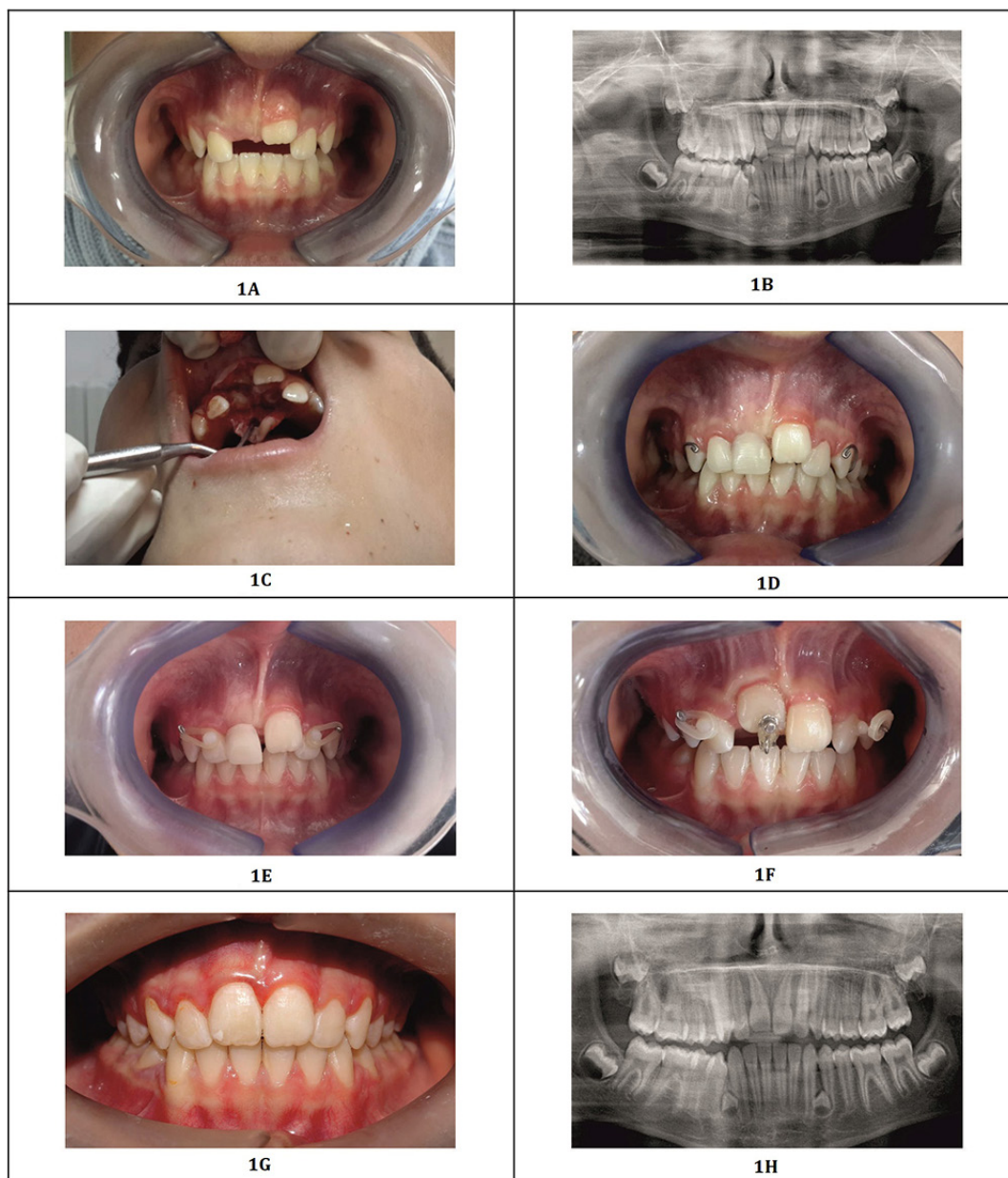


Figure 1. Clinical and radiological view of case 1 during the treatment process.

retentive areas were created with composite resin for these teeth. Class 1 elastics were extended from the lateral teeth to the C clasps of the canines to ensure distalization of the lateral teeth. The patient was only allowed to remove the elastics while eating, brushing teeth, and putting on new ones. The elastics were renewed once a day. The patient was asked to attend control visits for the activation of the appliance. The right maxillary central tooth erupted eight months after starting treatment, and the maxillary lateral teeth were localized in their correct positions. No aesthetic or functional impairment was noted at the end of the 24-month follow-up period (Figures 1G and 1H).

Case 2

A 10-year-old girl presented to our clinic complaining of the unaesthetic appearance of her anterior maxillary teeth. The patient was in good systemic health. An oral examination revealed positional and morphological anomalies in the anterior maxillary teeth (Figure 2A). Radiographic images showed that the permanent maxillary central teeth were impacted (Figure 2B). The supernumerary teeth were extracted and as a result of the consultation with the orthodontics department, it was decided that maxillary expansion using an expansion screw was appropriate in this region due to the transversal deficiency in the maxillary anterior region (Figure 2C). The patient's parents were instructed to activate the expansion screw once a week by one turn. The impacted teeth of the patient were checked through routine follow-up visits. The maxillary incisors erupted spontaneously after 9 months, however there were problems in positioning (Figure 2D), so the department of orthodontics was consulted, and it was decided to correct the problems through fixed orthodontic treatment. The fixed orthodontic treatment was initiated upon taking the initial records, maxillary and mandibular impressions, and intraoral and extraoral photos of the patient. The fixed orthodontic treatment was completed in 12 months (Figures 2E and 2F). Afterwards, the brackets were removed, and reinforcement treatment was initiated. No aesthetic or functional impairment was noted at the end of the 24-month follow-up period (Figures 2G and 2H).

Case 3

A 9-year-old boy presented with delayed exfoliation of the maxillary primary deciduous teeth (Figure 3A). The patient was in good systemic health, and oral examination revealed retained anterior maxillary teeth numbers 51 and 61. Radiographic examination revealed two anterior maxillary supernumerary teeth (Figure 3B). After consultation with the department of surgery, it was decided to perform an extraction of the anterior maxillary primary dentition and supernumerary teeth (Figures 3C and 3D). Following the surgical extraction of the anterior maxillary supernumerary teeth, due to the transversal

deficiency on the maxillary anterior region, the decision was made to fit a maxillary expansion screw appliance after consultation with the department of orthodontics. The treatment was continued with an expansion screw appliance for five months, with one turn made every four days. The patient continued using the appliance as a space maintainer without activating the screw for another seven months. Tooth number 11 exfoliated 1.5 years after the start of treatment (Figures 3E and 3F), and orthodontic treatment with a fixed appliance was done for the eruption of tooth number 21. Tooth number 21 erupted after orthodontic treatment. No aesthetic or functional impairment was noted at the end of the 24-month follow-up period (Figures 3G and 3H).

Results

The data garnered through the study indicates that the spontaneous eruption of permanent central teeth may last for up to three years. Orthodontic treatment may be required to ensure the even alignment of the erupting teeth. The teeth can be monitored for spontaneous eruption if there is ongoing root development, although orthodontic treatment will be necessary if the root development has already been completed, as such teeth have no chance of spontaneous eruption.

Discussion

Supernumerary teeth are of great concern to both the dentists and parents due to associated delayed eruption and occlusal and esthetic problems in the anterior maxillary segment in young patients. In the present study, the clinical examination of three cases revealed esthetic problems and delayed eruption of anterior incisors.

When a supernumerary tooth is diagnosed, the treatment steps that should be followed by clinicians are specified in literature as follows: (1) Creating sufficient space for the affected tooth, (2) Removal of the impaction etiology, i.e., the supernumerary tooth, (3) Surgical intervention to address the unerupted impacted tooth, and (4) Orthodontic traction and alignment.⁷ The extraction of supernumerary teeth is a general rule to avoid complications, but the optimal timing is controversial.⁸ There are two treatment options available in the presence of a delayed eruption of permanent teeth associated with supernumerary teeth. The first option involves the extraction of the supernumerary teeth as soon as the diagnosis is established. This can create dental phobia problems for a child, and lead to the devitalization or root deformation of adjacent teeth. Secondly, the extraction of the supernumerary tooth can be delayed until the root development of the adjacent teeth is complete. This option can cause a decrease in the eruptive force of the adjacent teeth and loss of space in the dental arch and midline shifts.^{9,10} Högström and Andersson,¹¹ argue that early interventions should be preferred to benefit from

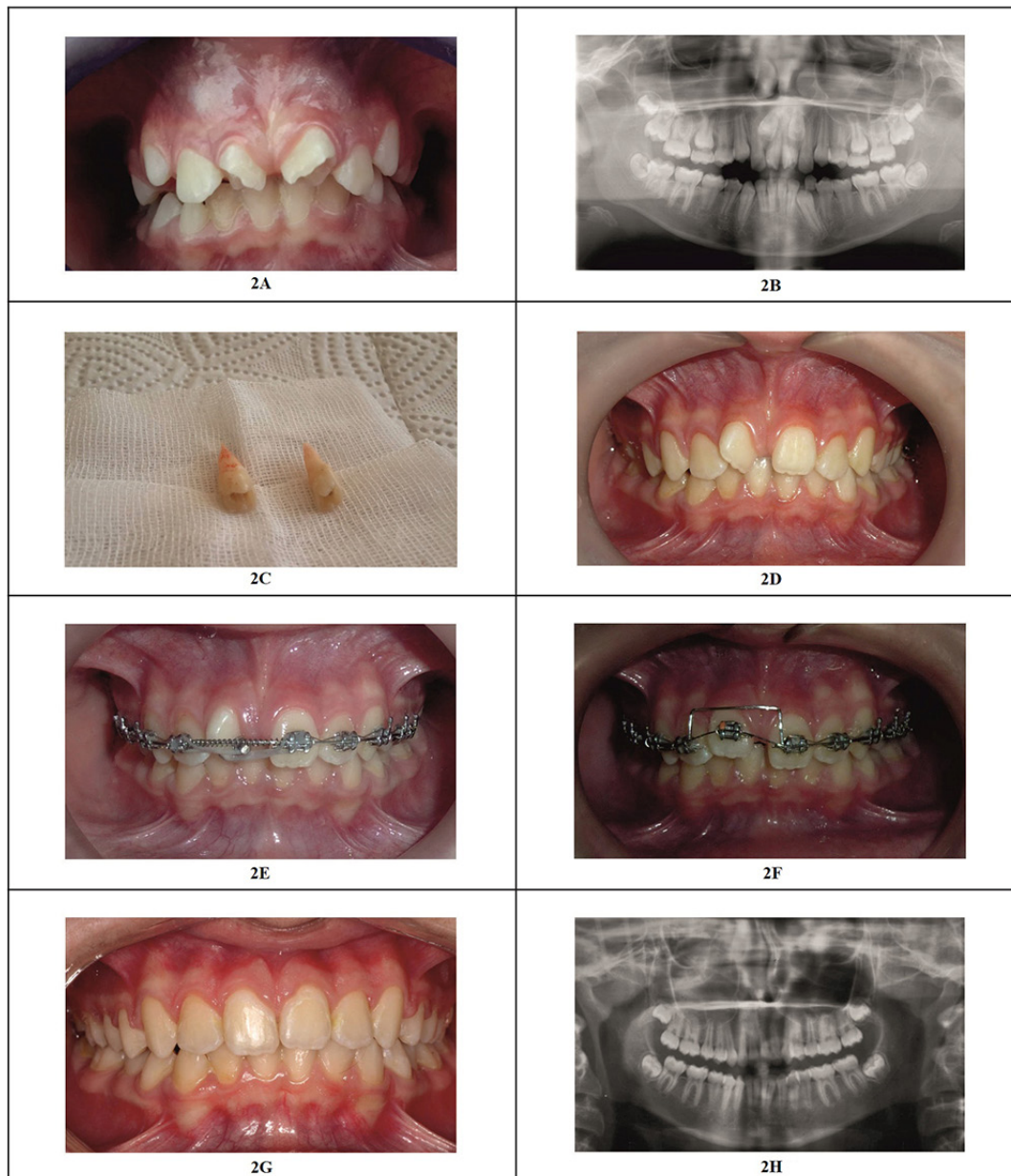


Figure 2. Clinical and radiological view of case 2 during the treatment process.

the spontaneous eruption potential of permanent incisors to prevent loss of space in the anterior region and to avoid midline shifts. Thus, teeth can be better aligned, and the need for orthodontic treatment can be minimized. When there is a supernumerary tooth in the upper anterior region, there are studies that recommend surgical operation be postponed until the age of 8–10 years, when the root development of the incisors is complete.¹² In the present study, the extraction of the supernumerary teeth was decided upon as soon as they were identified in the three cases, as the patients were within the appropriate time frame in terms of their age and the developmental stages of the adjacent teeth. In cases 1 and 3, the supernumerary teeth were extracted through an apically shifted flap, and the spontaneous eruption of the teeth was awaited. In case 2, there was no need for surgical intervention, so a standard

extraction procedure was performed on the erupted supernumerary teeth, and the spontaneous eruption of the impacted permanent teeth was awaited. In cases 2 and 3, the impacted teeth erupted spontaneously during the period when the patients were using a removable maxillary expansion appliance. However, orthodontic treatment was required for the existing position anomaly. This is in line with studies determining that rapid maxillary expansion following the surgical extraction of a supernumerary tooth preventing eruption accelerates the spontaneous eruption of maxillary incisors.^{13,14} For case 1, in turn, the spontaneous eruption of the right maxillary central incisor was awaited after the extraction of the supernumerary teeth. No maxillary expansion was needed as there was enough space. However, our patient was 11 years old, and the apex of the tooth was closed,

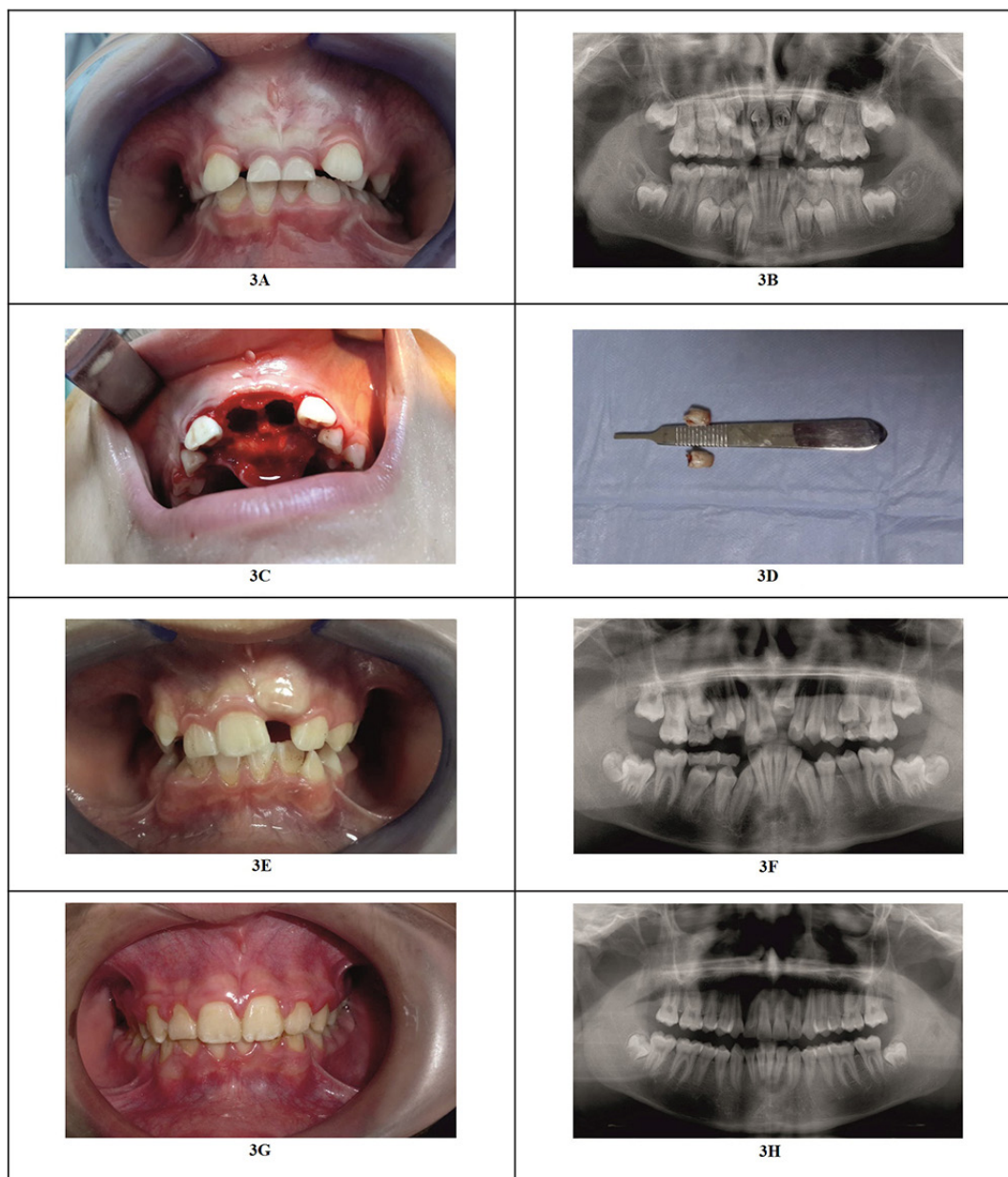


Figure 3. Clinical and radiological view of case 3 during the treatment process.

which made spontaneous eruption unlikely. Accordingly, orthodontic traction was provided by surgically opening a window, inserting a button, and modifying the previous pediatric prosthesis.

In this study, panoramic radiography was used to determine the position, anatomical neighborhood and treatment plan of the supernumerary teeth. It has been reported in the literature that cone beam computed tomography (CBCT) clearly shows the position and morphology of the supernumerary teeth as well as their distance from adjacent anatomical structures.¹⁵ However, the CBCT technique contains 3 to 7 times more radiation than panoramic radiography. For this reason, it is recommended to use the CBCT technique in pediatric dentistry considering the profit/loss ratio.¹⁶ In this study, the use of CBCT was not needed because panoramic

radiography was sufficient for the diagnosis and treatment planning of the cases.

Strengths and limitations

In this study, the diagnosis was made after careful clinical intraoral, extraoral examination and radiographic examination, and the patients were treated with methods that can be applied in routine clinical practice, without the need for advanced techniques. However, the relatively low number of cases and the absence of a control group that can be compared are also limitations.

Conclusion

Early diagnosis of delayed eruption of permanent successors is necessary to avoid many dental complications. The management of such cases should be

designed by a multidisciplinary team decision as there is no definitive time to surgically remove unerupted supernumerary teeth.

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Authors' Contribution

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Competing Interests

None declared.

Data Availability Statement

The datasets used in the current study are available from the corresponding author on reasonable request.

Ethical Approval

Informed consent was obtained from the parents of patients for publication of this report.

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References

- Garvey MT, Barry HJ, Blake M. Supernumerary teeth—an overview of classification, diagnosis and management. *J Can Dent Assoc.* 1999;65(11):612-6.
- Celikoglu M, Kamak H, Oktay H. Prevalence and characteristics of supernumerary teeth in a non-syndrome Turkish population: associated pathologies and proposed treatment. *Med Oral Patol Oral Cir Bucal.* 2010;15(4):e575-8. doi: 10.4317/medoral.15.e575.
- Pippi R. Odontomas and supernumerary teeth: is there a common origin? *Int J Med Sci.* 2014;11(12):1282-97. doi: 10.7150/ijms.10501.
- Liu DG, Zhang WL, Zhang ZY, Wu YT, Ma XC. Three-dimensional evaluations of supernumerary teeth using cone-beam computed tomography for 487 cases. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2007;103(3):403-11. doi: 10.1016/j.tripleo.2006.03.026.
- Kramer RM, Williams AC. The incidence of impacted teeth. A survey at Harlem hospital. *Oral Surg Oral Med Oral Pathol.* 1970;29(2):237-41. doi: 10.1016/0030-4220(70)90091-5.
- Subasioglu A, Savas S, Kucukyilmaz E, Kesim S, Yagci A, Dunder M. Genetic background of supernumerary teeth. *Eur J Dent.* 2015;9(1):153-8. doi: 10.4103/1305-7456.149670.
- Becker A. Early treatment for impacted maxillary incisors. *Am J Orthod Dentofacial Orthop.* 2002;121(6):586-7. doi: 10.1067/mod.2002.124171.
- Manuja N, Nagpal R, Singh M, Chaudhary S. Management of delayed eruption of permanent maxillary incisor associated with the presence of supernumerary teeth: a case report. *Int J Clin Pediatr Dent.* 2011;4(3):255-9. doi: 10.5005/jp-journals-10005-1121.
- Primosch RE. Anterior supernumerary teeth—assessment and surgical intervention in children. *Pediatr Dent.* 1981;3(2):204-15.
- Nazif MM, Ruffalo RC, Zullo T. Impacted supernumerary teeth: a survey of 50 cases. *J Am Dent Assoc.* 1983;106(2):201-4. doi: 10.14219/jada.archive.1983.0390.
- Högström A, Andersson L. Complications related to surgical removal of anterior supernumerary teeth in children. *ASDC J Dent Child.* 1987;54(5):341-3.
- Rajab LD, Hamdan MA. Supernumerary teeth: review of the literature and a survey of 152 cases. *Int J Paediatr Dent.* 2002;12(4):244-54. doi: 10.1046/j.1365-263x.2002.00366.x.
- Bryan RA, Cole BO, Welbury RR. Retrospective analysis of factors influencing the eruption of delayed permanent incisors after supernumerary tooth removal. *Eur J Paediatr Dent.* 2005;6(2):84-9.
- Pavoni C, Franchi L, Laganà G, Baccetti T, Cozza P. Management of impacted incisors following surgery to remove obstacles to eruption: a prospective clinical trial. *Pediatr Dent.* 2013;35(4):364-8.
- Tsuji M, Suzuki H, Suzuki S, Moriyama K. Three-dimensional evaluation of morphology and position of impacted supernumerary teeth in cases of cleidocranial dysplasia. *Congenit Anom (Kyoto).* 2020;60(4):106-14. doi: 10.1111/cga.12358.
- Nematollahi H, Abadi H, Mohammadzade Z, Soofiani Ghadim M. The use of cone beam computed tomography (CBCT) to determine supernumerary and impacted teeth position in pediatric patients: a case report. *J Dent Res Dent Clin Dent Prospects.* 2013;7(1):47-50. doi: 10.5681/joddd.2013.008.

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