Supernumerary Teeth in the Maxillary Anterior Region: The Dilemma of Early Versus Late Surgical Intervention

Ofer Sarne*/Yehoshua Shapira**/ Sigalit Blumer***/ Tamar Finkelstein****/
Shirley Schonberger*****/ Naomi Bechor******/ Nir Shpack*******

Supernumerary teeth are the most common developmental dental anomalies in the maxillary anterior region causing interference to the developing permanent incisors resulting in poor dental and facial esthetics. Two different opinions regarding the timing for surgical removal of the supernumerary teeth are presented. In this case report, three brothers with supernumerary teeth in the maxillary anterior region are presented, their surgical and orthodontic management and outcome are discussed.

Key words. *Supernumerary teeth, children, orthodontics, timing, surgery.*

INTRODUCTION

Supernumerary teeth is defined as an excess number of teeth compared to the normal dental series. They may develop in any region of the dental arches, but are found more frequently in the permanent than in the deciduous dentition and are located mainly in the maxillary anterior region. The most common supernumerary tooth is the conical, peg-shaped mesiodens, detected in the maxillary midline[1]. However the shape may be conical, tuberculate, odontome, or closely resemble the normal tooth, based on their morphology. There is no definite time when they may develop, from prior to birth, or as late as ten years, especially in the premolar region. The number of supernumerary teeth in a patient is not limited, from one to as many as the jaws can hold. They can be single or multiple, unilateral or bilateral, erupted or impacted, in one jaw or in both jaws[2].

From the The Maurice and Gabriela Goldschleger School of Dental Medicine, Tel Aviv University, Tel Aviv, Israel.
* Ofer Sarne, DMD, Clinical Director, Department of Orthodontics.
** Yehoshua Shapira DMD, Clinical Associate Professor, Department of Orthodontics.
*** Sigalit Blumer DMD, Instructor and Acting Head, Department of Pediatric Dentistry.
**** Tamar Finkelstein DMD, Instructor, Department of Orthodontics.
***** Shirley Schonberger DMD, Instructor, Department of Orthodontics.
****** Naomi Bechor DMD, Instructor, Department of Orthodontics.
******* Nir Shpack DMD, MSc, Senior Lecturer and Chairman, Department of Orthodontics.

Send all correspondence to:
Yehoshua Shapira,
Department of Orthodontics,
The Maurice and Gabriela Goldschleger School of Dental Medicine
Tel Aviv University, Tel Aviv 69978 Israel
Phone: +972-2-5335531
E-mail: yehoshua.shapira@gmail.com

The prevalence of supernumerary teeth is 0.3%–0.8% in the deciduous dentition and 1.5%–3.5% in the permanent dentition with increased frequency in males than in females (2:1 ratio), and higher prevalence among Asian populations[3].

The etiology of these teeth is still obscure although several theories have been suggested such as genetics, dichotomy (splitting) of the tooth bud, excessive growth of the dental lamina and atavism, or merely a left over from the Anthropoids who had more teeth than Homosapiens[4,5]. It may also be associated with specific developmental syndromes, such as cleft lip and palate, cleidocranial dysplasia, chorhinophalangeal syndrome and Gardner's syndrome[6]

Supernumerary teeth may stay in their position for many years without any clinical interference to the dentition. They may erupt, stay impacted, appear inverted and assume an abnormal ectopic position. However, they most frequently cause local disturbances such as delay or prevention in the eruption of the associated permanent incisors, midline diastema, crowding and malalignment of the incisors, displacement and rotations of the adjacent teeth, possible development of dentigerous cyst, root resorption or dilaceration and migration into the nasal cavity or maxillary sinus[7-10]. Supernumerary teeth in the maxillary anterior region may also compromise facial esthetics. They may be detected by clinical examination as a result of delay in the normal eruption of the permanent incisor, or in a routine radiographic examination (panoramic or periapical) for pediatric dentistry or orthodontic examination and treatment planning. Therefore, early detection and timely intervention is imperative to avoid these deleterious effects in the maxillary anterior region and the need for a long orthodontic therapy.

This case report presents three brothers with different non-syndromic types of supernumerary teeth in the maxillary anterior region. Their surgical intervention and orthodontic management to bring the permanent incisors into the normal position in the dental arch are discussed.

Clinical treatment options

The treatment usually includes surgical removal of the supernumerary tooth. It is well accepted among orthodontists and pediatric dentists that an erupted supernumerary tooth should be immediately removed as soon as diagnosed to avoid eruption delay or malalignment of the permanent incisors (Fig. 1, A, B). However, there are controversies and different opinions in the literature regarding the optimal time for surgical intervention and removal of the impacted supernumerary tooth[11] (Fig. 2, A, B). Several treatment options have been suggested to deal with impacted supernumerary teeth:

1. Removal of the retained deciduous tooth and the supernumerary tooth waiting for the natural eruption of the permanent incisor into the dental arch.
2. Removal of the retained deciduous tooth and surgical removal of the supernumerary tooth with exposure of the impacted permanent incisor, expecting its natural eruption.
3. Removal of the retained deciduous tooth, surgically remove the supernumerary tooth, expose the crown of the impacted permanent incisor following by bonding an attachment with a twisted ligature wire for active orthodontic extrusive traction into the oral cavity.

Case 1

The first boy, 8 years old, had the chief complaint of un-esthetic malalignment of his maxillary anterior teeth. His medical and dental histories were non-contributory. Intraoral examination revealed Class I occlusion in the early mixed dentition, with his maxillary central incisors crowded and rotated, while the left permanent lateral incisor was blocked out labially (Fig. 3- A, B, C). Radiographic examination revealed that the central incisors are two erupted supernumerary teeth very similar in their shape and size to the normal permanent central incisors. These supernumerary teeth blocked the eruption of the permanent central incisors (Fig. 3- D–Arrows).

Figure 1 – Erupted supernumerary teeth causing malalignment of the permanent central incisors.
A–Mesiodens erupted labial to the right permanent central incisor.
B–Mesiodens erupted in the midline between the right central and left lateral incisors.

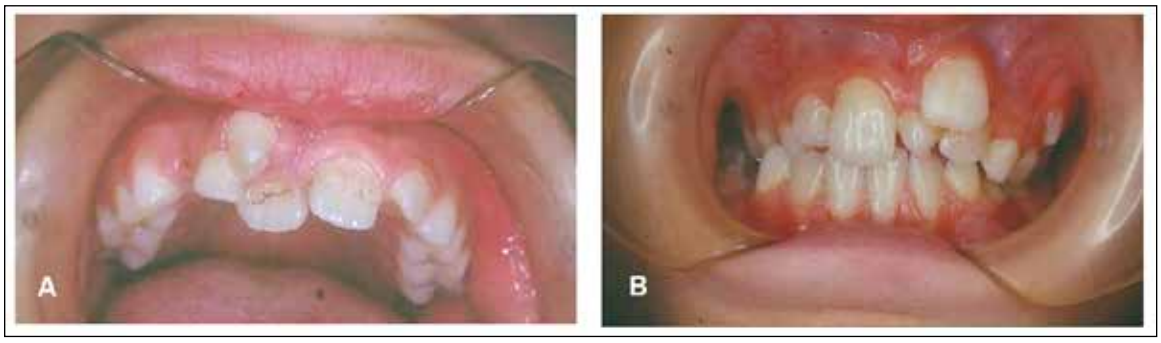
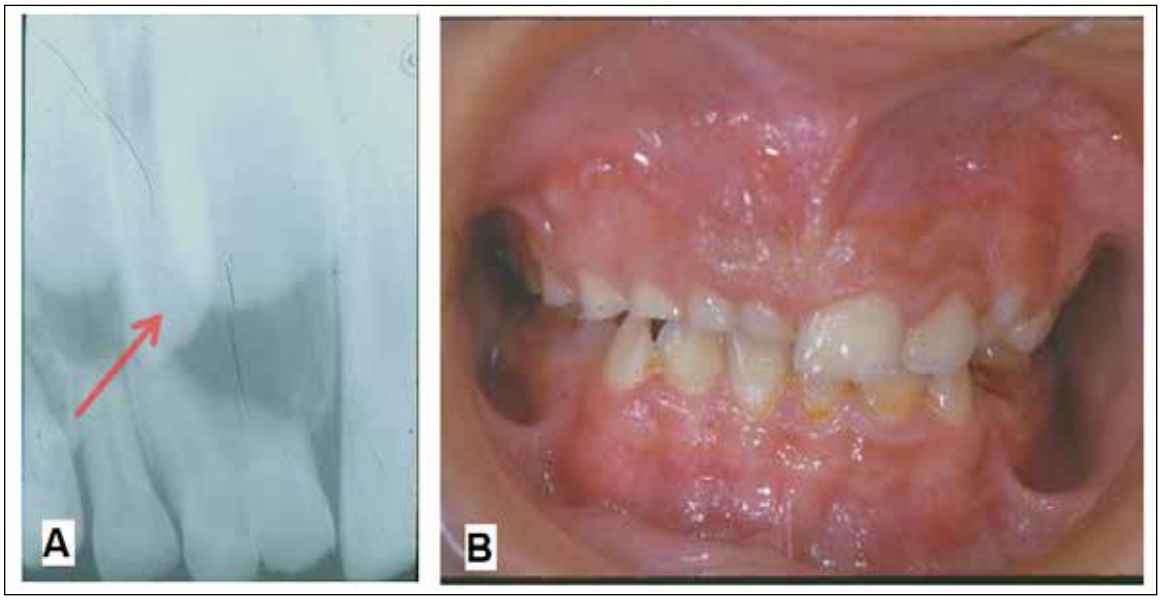


Figure 2 – Impacted supernumerary teeth causing failure in eruption of the permanent central incisors.
A – Radiograph showing a supernumerary tooth between the permanent right central and lateral incisors (Arrow).
B–The intra oral photograph of the case shown in A, with the retained deciduous incisors.



His treatment included removal of the two erupted supernumerary teeth (Fig. 3- E), surgical exposure of the impacted permanent central incisors, bonding attachments to their crowns with twisted ligature wire for active extrusive traction into the oral cavity. This was followed by orthodontic alignment of the teeth in the dental arch using fixed Edgewise orthodontic appliance. After completion of treatment the teeth were retained with a bonded permanent fix retainer (Fig. 4- A, B, C).

Figure 3 – An 8 years old boy with 2 erupted supernumerary teeth, which were very similar in shape and size to the permanent central incisors, blocking their eruption.

Facial smiling view, B – Frontal and C- occlusal views showing the 2 erupted supernumeraries and the blocked out left permanent lateral incisor. D – Panoramic radiograph showing the erupted supernumerary teeth (Arrows) and the impacted central incisors. E – The extracted 2 supernumeraries.

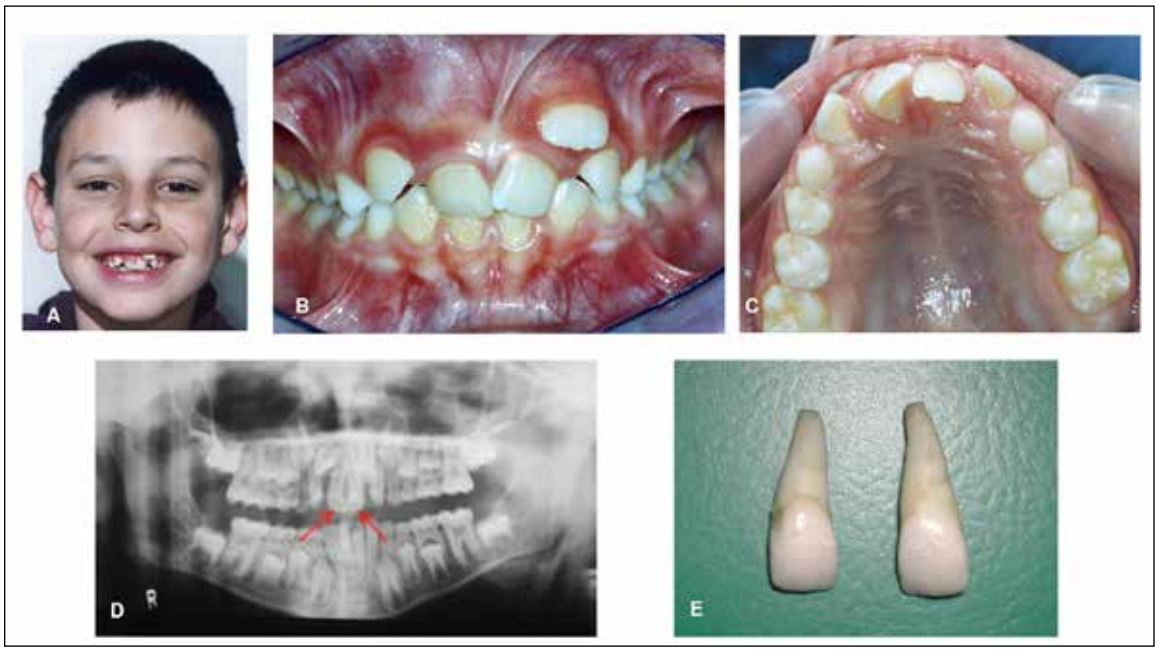
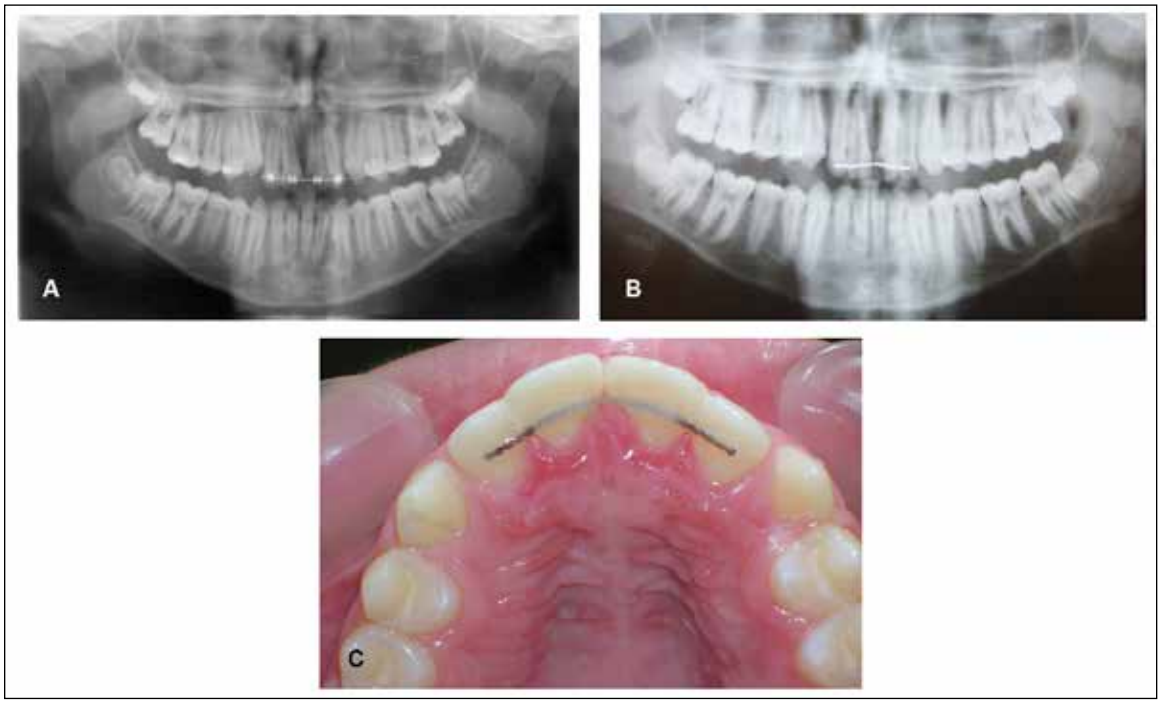


Figure 4 – A – End of treatment panoramic radiograph. B–Post-treatment panoramic radiograph with fixed retainer. C–Intraoral occlusal view with a fixed retainer.



Case 2

The second brother, 7 years old, had complaint that his maxillary central incisors had not erupted yet. His medical and dental histories were non-contributory. Intraoral examination presented Class I occlusion in the early mixed dentition with retained deciduous central incisors and erupted permanent lateral incisors (Fig. 5- A, B). Radiographic examination disclosed the retained deciduous incisors and two impacted supernumerary teeth (Arrows) preventing the eruption of the permanent central incisors (Fig. 5- C). The deciduous incisors were extracted, the two impacted supernumeraries which resembled the permanent central incisors were surgically removed (Fig. 5- D) and the permanent central incisors crowns were exposed and bonded with attachments and twisted ligature wires (Fig. 6- A). Active traction forces were used to pull them out and align them into the dental arch using Edgewise appliance (Fig. 6- B). At the end of treatment the incisors were bonded with a permanent fix retainer.

Case 3

The third brother was only 5.5 years old when his mother came with him for early consultation following his two brothers who presented with supernumerary teeth. His medical and dental histories were non-contributory. He had Class I occlusion in the deciduous dentition. A diagnostic panoramic radiograph revealed one supernumerary tooth, a mesiodens, located apical to the maxillary right deciduous central incisor under the crown of the right permanent central incisor (Fig. 7- A–arrow).

It was decided to keep him under follow up observation until the left permanent central incisor erupted (Fig. 7- C, D). The right permanent central incisor was arrested by the mesiodens and did not change its position (Fig. 7- B- Arrow). At that stage surgical intervention was indicated and the mesiodens was surgically removed, the crown of the right permanent central incisor was exposed, bonded with an attachment and twisted ligature wire allowing its

Figure 5 – His brother, 7 years old.

A – Frontal and B- Occlusal views showing the two retained primary central incisors and the erupted permanent lateral incisors.

C – Panoramic radiograph showing the two impacted supernumerary teeth (Arrows). D – The extracted supernumeraries.

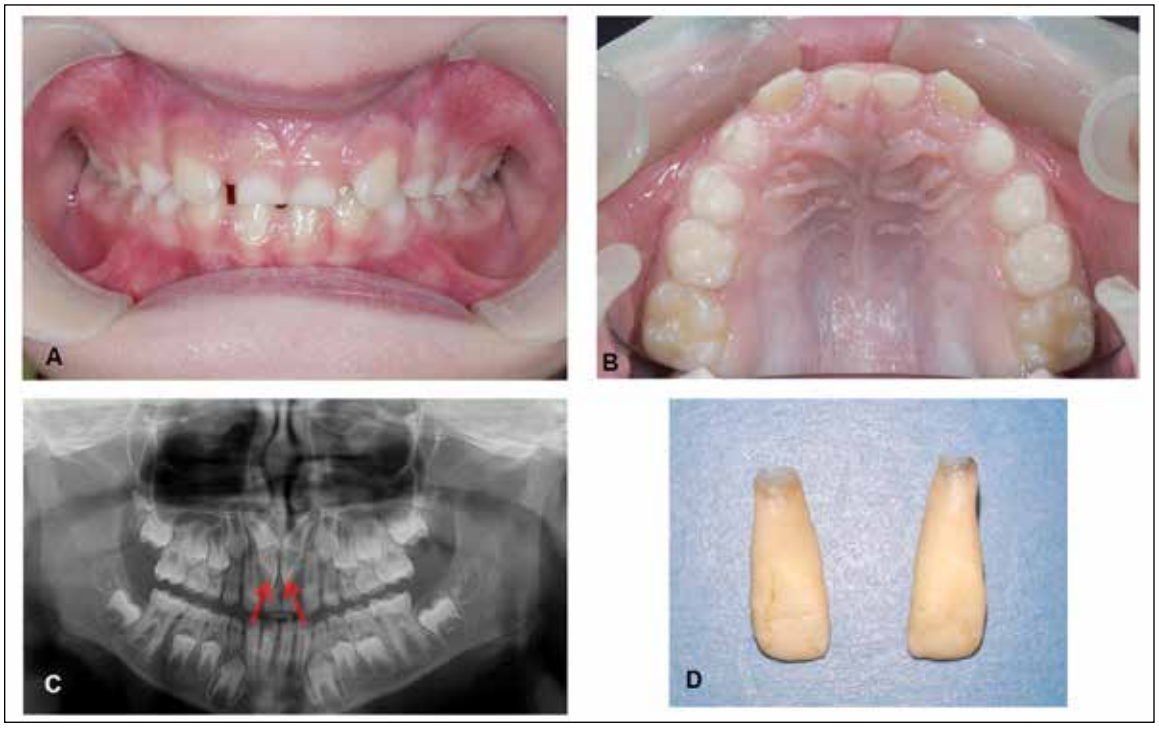
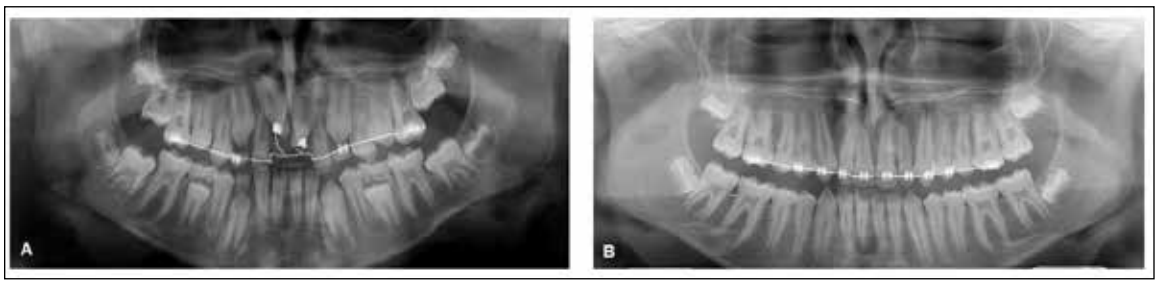


Figure 6 – A – Panoramic radiograph showing occlusal traction of the central incisors.

B – Panoramic radiograph showing their final position in the dental arch.



active traction and alignment into the dental arch with fixed Edgewise appliance (Fig. 8- A). At the completion of orthodontic treatment the incisors were bonded with a permanent fix retainer.

Interesting enough, his follow up panoramic radiograph 4 years later detected two new developing supernumerary teeth in the mandibular premolar region (Fig. 8- B- Arrows). Whenever a supernumerary tooth is detected in a patient always look for others in both jaws. You may sometimes be surprised to find new developing supernumeraries.

DISCUSSION

The detection of supernumerary teeth in three children of the same family probably follows a genetic trend. The first two brothers presented with two supernumerary teeth each in the maxillary anterior region, both were very similar in shape and size to the normal central incisors. However, in the first child the supernumerary teeth were fully erupted, preventing the normal eruption of the permanent central incisors, while in his brother they were completely impacted blocking the way for the eruption of the permanent central incisors and the exfoliation of the deciduous central incisors. Unlike his two brothers, the third child had one impacted cone-shaped supernumerary tooth, a mesiodens, avoiding eruption of the right permanent central incisor, and several years later two new supernumerary teeth developed in the mandibular premolar region.

Figure 7 – The younger brother, 5.5 years old, in the primary dentition.

A–Panoramic radiograph showing one mesiodens (Arrow) between the Primary and permanent right central incisors.

B – Panoramic radiograph showing the mesiodens arresting the eruption of the right permanent central incisor (Arrow).

C–Facial smiling view and D–Intraoral frontal view showing the erupted left permanent central and both permanent lateral incisors.

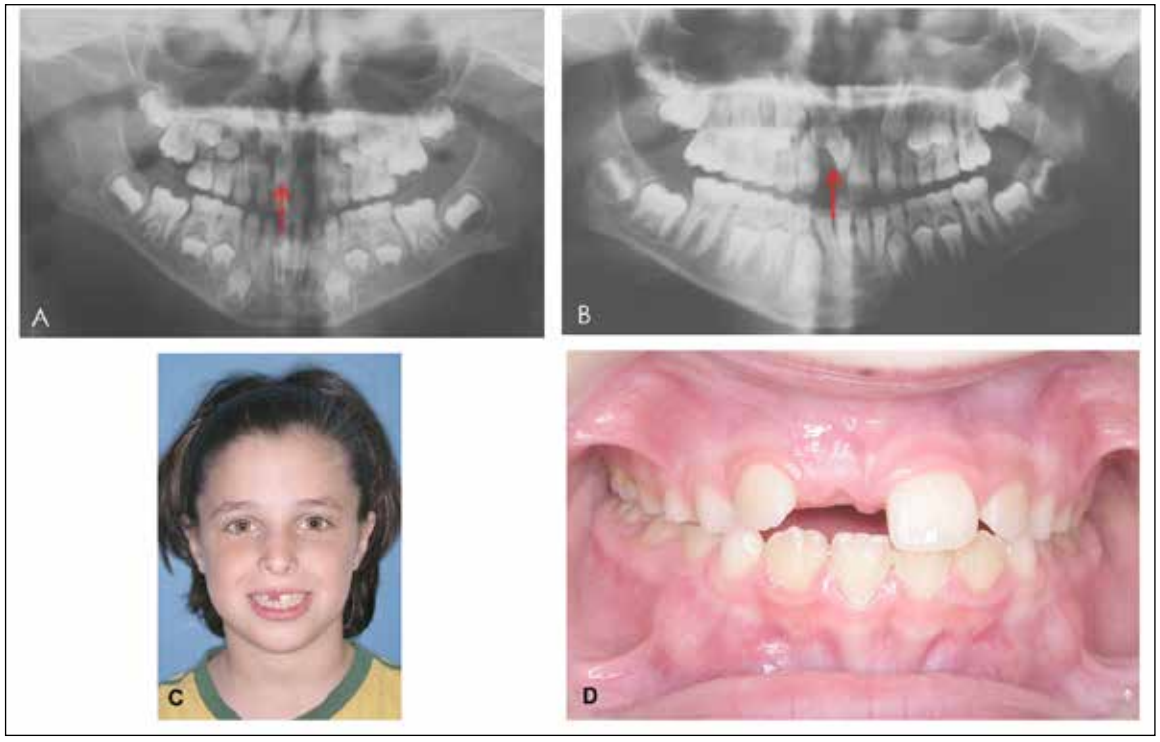
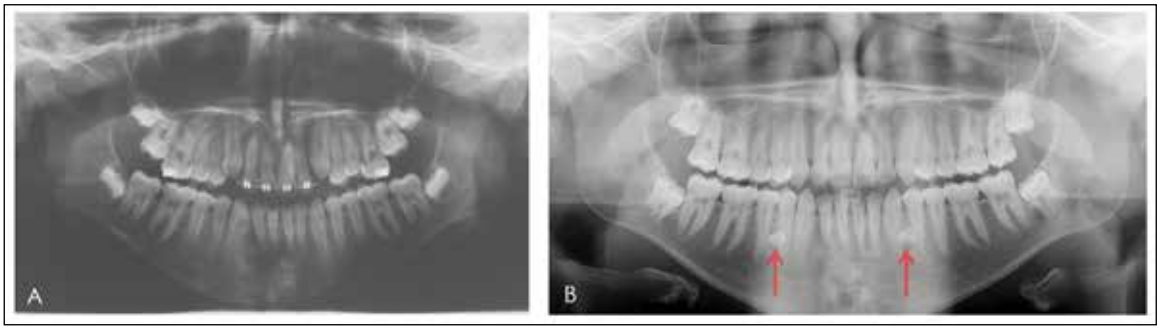


Figure 8 – A–Panoramic radiograph close to end of treatment.

B–Panoramic radiograph four years later showing two new supernumerary teeth in the mandibular premolar region (Arrows).



Two different opinions have been suggested regarding the timing for surgical removal of impacted supernumerary teeth with their advantages and disadvantages. Early removal of the unerupted supernumerary tooth as soon as diagnosed, or delay the intervention and wait until root formation of the adjacent permanent teeth is completed. Studies have showed no complications or disturbances to adjacent teeth with incomplete root development following early surgical removal of an impacted supernumerary tooth in the maxillary anterior region, compared to postponement of surgery until incisors root development is completed[11].

It has been reported that immediate removal of a supernumerary tooth, at the age of 5 years is superior to delayed removal, after the age of 7 years, since the prevalence of future complications such as retarded eruption of the permanent incisors or the need for additional surgical procedure is reduced considerably[12].

Most authors recommend early intervention and surgical removal of the unerupted supernumerary tooth as soon as it is detected[13]. The main reason is to take advantage of the spontaneous eruptive potential of the permanent incisor, to avoid eruption delay or failure of their eruption, crowding, space loss and midline shift which may require extensive orthodontic therapy. Therefore, an impacted supernumerary tooth should be extracted as soon as diagnosed at a young age when it appears to cause damage to adjacent teeth. The ideal age for removal has been reported to be 6 to 7 years old, after which more complications are expected[14].

Other authors suggest delayed surgical intervention until root development of the adjacent permanent incisors is completed to avoid their possible damage, loss of vitality or root resorption as a result of the surgical removal of the impacted supernumerary tooth. In addition, early surgical intervention in a young child requires treatment under general anesthesia with complication risks and might create a psychological dental anxiety[15]. Moreover, it has been suggested that early exposure and bonding the unerupted incisor may result in loss of supporting bone and create scar tissue, which may further delay its eruption[3].

A study has been reported that 1 out of 2 children with impacted maxillary incisors caused by supernumerary teeth showed spontaneous eruption of the impacted teeth after removal of the supernumeraries. When the impacted permanent incisor is surgically exposed it is recommended to bond it with an attachment and twisted ligature wire or chain during the first operation to provide the traction of the tooth should it not erupt spontaneously, thus avoid the need for a second surgery[16].

A more recent study has shown that spontaneous eruption of an impacted maxillary incisors after removal of the supernumerary teeth depends on several factors such as the depth of the impacted tooth, amount of root development, the angulation of the impacted tooth, and the available space required for its eruption. They have reported that 64% of the cases of impacted incisors failed to erupt spontaneously without any kind of treatment following the surgical removal of the supernumerary teeth. Therefore, immediate orthodontic extrusive traction to erupt the impacted incisors following the surgical removal of the supernumerary teeth was highly recommended[17].

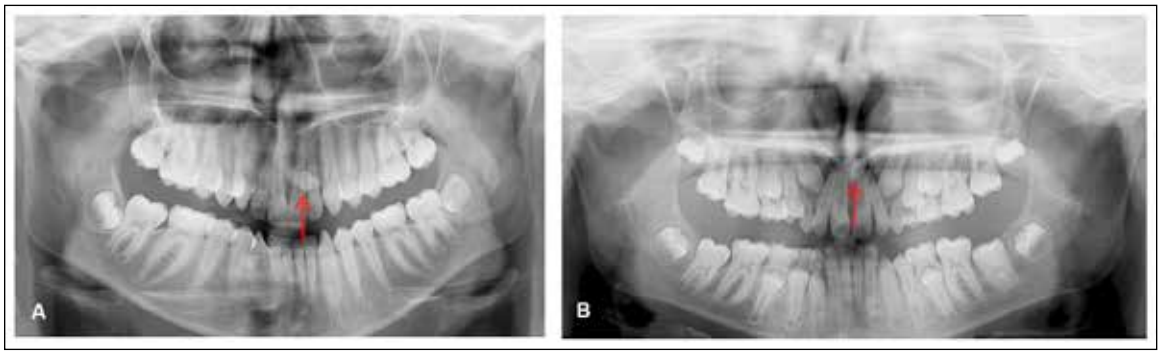
The dilemma of how early should an impacted supernumerary tooth be surgically removed following its early detection, and the permanent incisor exposed and bonded for extrusive traction still remains open. Moreover, when a routine panoramic radiograph detects an impacted mesiodens which does not cause any damage to the already erupted maxillary incisors and are symptom less as described in (Fig. 9, A and B), is an attempt to surgically remove them justified as it could be hazardous to the adjacent teeth; perhaps they should be left in place and timely radiographic follow-up is the right solution. Any treatment decision for the optimal time for unerupted supernumerary teeth removal should be assessed and considered individually for each and every case after close consultation with an experienced oral surgeon. If no pathological conditions are present and incisors eruption is not arrested, timely observation with radiographs would be advisable[18].

CONCLUSION

Supernumerary teeth are a common finding in the maxillary anterior region. Different opinions regarding the optimal time, early versus late, surgical intervention for their removal and orthodontic treatment were discussed. Treatment alternatives and outcomes were presented in three brothers with different types and position of supernumerary teeth.

Figure 9 – A–Panoramic radiograph presenting a horizontally impacted mesiodens (Arrow).

B – Panoramic radiograph showing an inverted mesiodens above the apices of the central incisors (Arrow).



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