Critically Appraised Topic (CAT)

Project Team:
7B-1
Project Team Participants:
Jesus Echezarreta, Gabriella Andrie, Omar Karim, Alex Orzepowski
Clinical Question:
In patients with permanent teeth blocked from eruption by supernumerary teeth, does extraction and normal eruption lead to better outcomes than extraction and immediate orthodontic extrusion?
PICO Format:
P:
Unerupted permanent teeth due to presence of supernumerary teeth
I:
Extraction with natural eruption
C:
Extraction with orthodontic extrusion
O:
Reestablishment of complete occlusion
PICO Formatted Question:
In patients who have unerupted permanent teeth due to supernumerary teeth, does extraction with natural eruption as compared to extraction with orthodontic extrusion result in a more efficient reestablishment of complete occlusion?
Clinical Bottom Line:
In the process of treatment planning, do we need to get orthodontics involved right away or allow the natural process of eruption to occur and then get orthodontics involved if needed?
Date(s) of Search:
10/20, 10/21, 11/02, 11/03
Database(s) Used:
PubMed.gov
Search Strategy/Keywords:
Studies containing information about the prevalence/incidence, clinical characteristics and management of supernumerary teeth.
MESH terms used:
Adolescent. Child. Orthodontic Extrusion. Tooth Extraction*. Tooth, Supernumerary / surgery. Tooth, Unerupted / etiology.
Article(s) Cited:
Gupta S, Marwah N. Impacted Supernumerary Teeth- Early or Delayed Intervention: Decision

Making Dilemma?. Int J Clin Pediatr Dent 2012; 5(3):226-230.

Mínguez-Martinez, I., Ata-Ali, J., Bonet-Coloma, C., Peñarrocha-Oltra, D., Peñarrocha-Diago, M. A., & Minguez-Sanz, J. M. Management and outcome following extraction of 303 supernumerary teeth in pediatric patients. *Pediatric Dentistry* (2012), *34*(5), 136–139.

Yassin OM, Hamori E. Characteristics, clinical features and treatment of supernumerary teeth. J Clin Pediatr Dent. 2009 Spring;33(3):247-50.

Study Design(s):

Case Report (1) and Case Series (2)

Reason for Article Selection:

The first article discusses when early or delayed intervention is justified for impacted supernumerary teeth, management phases, and prevalence/incidence of this anomaly. It will help guide the clinician with decision-making in treatment planning and optimum timing of intervention. The second article discusses various treatments of permanent teeth impacted due to supernumerary teeth and the success of these treatments. This article also discusses various trends of supernumerary teeth that can guide clinicians diagnostically. The third and final article describes the clinical features and management of supernumerary teeth. It will help the clinicians diagnose and identify various forms of supernumerary teeth and guide the clinician to the ideal management.

Article(s) Synopsis:

Article I is a **case report:**
Method: Evaluated 4 cases of impacted supernumerary teeth reported to the Department of Pedodontics and Preventive Dentistry. Population age ranged from 5-11 years old. Intraoral and radiographic examinations were performed. Surgical intervention was performed for 2 of the cases: the palatally erupted supernumerary was extracted first followed by the impacted supernumerary and nonresorbable black silk sutures were used. The other 2 cases delayed surgical intervention and were kept on follow-up until root formation of neighboring permanent dentition was complete. Once complete, extraction of supernumerary teeth was completed. **Results:** All 4 cases had successful outcomes following management of the supernumerary teeth. **Conclusions:** The first phase of managing supernumerary teeth is localizing and identifying complications associated with them. This can be done with a series of PAs using paralleling techniques and various horizontal/vertical angles. Early intervention may result in spontaneous correction of an existing malalignment due to the eruptive potential of the permanent teeth (no need for ortho). Early intervention may also prevent anterior space closure and midline shifts. The major disadvantages of early intervention is potential damage to the adjacent permanent teeth and a young child not being able to tolerate such surgery. Delayed intervention is suggested in order to allow root development of neighboring permanent dentition to complete. The behavior of the child will also be easier

to manage thus reducing trauma and anxiety. The main disadvantage of delayed intervention is less eruptive forces will be present, creating loss of anterior arch space and potential midline deviations. **Limitations:** Low-level evidence as a case report.

Article II is a **case series: Method:** Prospective clinical study of a population of 200 children (age range 2-14 years old) seen at the Department of OMS reference of University Children's Hospital in Valencia, Spain. Operated/controlled by same surgeon. Follow-up period had to be at least 18 months long. Data was collected: sex, age, location, type of dentition, # of supernumerary teeth and surgical approach. Measurements and photographs of extracted supernumerary were taken. Treatment included extraction, orthodontic traction, and relocation. SPSS 15.0 stat software used to analyze results. **Results:** Male/female ratio was 2.3:1. 88% of the supernumerary were located in the maxilla and 86% were found in the permanent dentition. 135 cases had a single supernumerary. 118 teeth were conoid shaped followed by 92 supplementary, 66 tuberculate, and 27 varied. 54% of the teeth displayed complete root formation. In 61% of the permanent teeth, the supernumerary caused impaction of the former BUT there were no cases of impaction recorded in the primary dentition. Treatment outcome was 100% favorable in orthodontic tractions, 80% of relocations, and 65% of conductive alveolectomies. **Conclusions:** Treatment should be individualized and consider the height of the impacted tooth, position, and remaining arch space. Despite high treatment outcome/favorable evolving of permanent teeth reported in this case series, it can be misleading and treatment should be decided case by case. However, it is promising that this study found no cases of root resorption pre/post treatment just as other studies have found. It's important to note that extraction is not always the right choice of treatment. A supernumerary can be monitored if there is satisfactory eruption of the related teeth, no active orthodontic treatment indicated, no pathology and if removal would adversely affect neighboring teeth. **Limitations:** Unable to determine # of supernumerary teeth that were left in place/monitored (only included those that had surgery).

Article III is a **case series: Method:** Retrospective study at a military hospital in North of Jordan. Population was 139 patients diagnosed with supernumerary teeth and referred to pediatric dental clinic from April 1993- June 2007. Data was recorded: age, gender, supernumerary type, location, stage of development, eruption status, #, method of treatment, effect on adjacent permanent teeth, associated systemic syndromes and need for orthodontic after extraction. Follow-up period was an average of 9.3 months. **Results:** The population age ranged from 2-16 years old. The male to female ratio was 2.2:1. 65% of the supernumerary teeth were conical shaped followed by 23.7% supplementary, 10.8% tuberculate and 0.5% odontoma. Over two-thirds of the teeth were erupted. Only 21.6% of the patients had multiple supernumerary teeth present. The most common location was the premaxilla and the most common effect on adjacent permanent dentition was delayed eruption followed by crowding. Cleft lip was the most common associated anomaly. 81.7% of

indicated treatment was simple or surgical extraction of the supernumerary teeth. Ortho was needed after extraction in 74.1% of the patients. **Conclusions:** Most patients will present with a single supernumerary teeth in the premaxilla region. It is extremely rare to have multiple in the absence of any associated syndromes. The supernumerary teeth are usually found radiographically and tend to be asymptomatic. Early diagnosis can prevent or reduce the risk of complications. This article concluded that early diagnosis and early surgical intervention presents a better prognosis. **Limitations:** Majority of the patients were managed with surgical intervention. The article had a higher mean age (9.43 years old) than other regional studies, which may have led to increased root development and eruption displayed. ¾ of the patients needed orthodontic treatment, further indicating the need for surgical intervention.

Levels of Evidence: (For Therapy/Prevention, Etiology/Harm)

See http://www.cebm.net/index.aspx?o=1025

☐ **1a** – Clinical Practice Guideline, Meta-Analysis, Systematic Review of Randomized Control Trials (RCTs)
☐ **1b** – Individual RCT
☐ **2a** – Systematic Review of Cohort Studies
☐ **2b** – Individual Cohort Study
☐ **3** – Cross-sectional Studies, Ecologic Studies, "Outcomes" Research
☐ **4a** – Systematic Review of Case Control Studies
☐ **4b** – Individual Case Control Study
☐ **5** – Case Series, Case Reports
☐ **6** – Expert Opinion without explicit critical appraisal, Narrative Review
☐ **7** – Animal Research
☐ **8** – In Vitro Research

Strength of Recommendation Taxonomy (SORT) For Guidelines and Systematic Reviews
See article **J Evid Base Dent Pract 2007;147-150**

☐ **A** – Consistent, good quality patient oriented evidence
☐ **B** – Inconsistent or limited quality patient oriented evidence
☐ **C** – Consensus, disease oriented evidence, usual practice, expert opinion, or case series for studies of diagnosis, treatment, prevention, or screening

Conclusion(s):

It is important to diagnose supernumerary teeth early, establish its position and the dental status of the adjacent permanent dentition in order to decide if early or late intervention is necessary. Early intervention is indicated if our patient's permanent roots adjacent to the supernumerary teeth are ⅓ to ½ developmentally complete. **If** early intervention is indicated, one of the articles has concluded it will have a better prognosis than delayed management. We need to individualize our treatment approach and consider that these supernumerary

teeth may be left in place and simply monitored if the previously mentioned requirements are met.

The presented articles can help us gather more clinical characteristics and diagnostic information of the supernumerary teeth. Though the evidence is limited, these articles can guide us with the management of the impacted permanent teeth due to supernumerary presence. **For our case:** I would suggest gathering as much information about the supernumerary teeth type, location, developmental status, and neighboring permanent dentition before deciding which management option is best. Early diagnosis is the key and usually identified radiographically. If our patient's neighboring permanent dentition roots are at least ⅔ developmentally complete and the patient's behavior will be manageable, we may consider early surgical intervention. It is also important to advise the patient's parents that orthodontic treatment following extraction is often indicated.