**Critically Appraised Topic (CAT)**

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| **Project Team:**  |
| 3A-4 |
| **Project Team Participants:**  |
| Mason WistenbergAle Tomasino-PerezMichael DruckMatthew Wilks |
| **Clinical Question:** |
| How often do supernumerary teeth present with pathology? |
| **PICO Format:** |
| **P:** |
| Patients with supernumerary teeth |
| **I:** |
| Extraction |
| **C:** |
| Retainment |
| **O:** |
| Long term consequences  |
| **PICO Formatted Question:** |
| In patients with supernumerary teeth how does extraction compared to retainment lead to long-term consequences? |
| **Clinical Bottom Line:** |
| As evidenced by the studies, in patients with supernumerary teeth removal is the treatment of choice for the majority of these cases. The timing of when it would be best to intervene may differ based on who is asked but ultimately most if not all authors agree that extraction of these supernumeraries needs to be done, it is just a matter of when.  |
| **Date(s) of Search:**  |
| September 29, 2020  |
| **Database(s) Used:** |
| PubMed |
| **Search Strategy/Keywords:** |
| Supernumerary teeth, eruption rate, risk, supernumerary, surgical intervention, early and delayed intervention  |
| **MESH terms used:** |
| Tooth, supernumerary / diagnosis, supernumerary / etiology, eruption  |
| **Article(s) Cited:** |
| Gupta, S., & Marwah, N. (2012). Impacted supernumerary teeth-early or delayed intervention: decision making dilemma?. *International journal ofpediatric dentistry*, *5*(3), 226–230. <https://doi.org/10.5005/jp-journals-10005-1173>.Mitchell L, Bennett TG. Supernumerary teeth causing delayed eruption--a retrospective study. Br J Orthod. 1992 Feb;19(1):41-6. doi: 10.1179/bjo.19.1.41. PMID: 1562577.Nazif MM, Ruffalo RC, Zullo T. Impacted supernumerary teeth: a survey of 50 cases. J Am Dent Assoc. 1983 Feb;106(2):201-4. doi: 10.14219/jada.archive.1983.0390. PMID: 6572675. |
| **Study Design(s):** |
| Case Series |
| **Reason for Article Selection:** |
| **Article 1 - Gupta:**Evaluated the advantages and disadvantages of early and delayed intervention. **Article 2 - Mitchell:**Discussed different managements of a supernumerary tooth when it is interfering with eruption:* Removing the supernumerary tooth only
* Removing the supernumerary tooth and the bone that is over the unerupted tooth
* Removing the supernumerary tooth and the bone that is over the unerupted tooth with or without placing a bonded attachment or ligature for orthodontic traction

Moreover, the study aimed to determine the proportion of unerupted teeth that were successful in spontaneous eruption after the removal of only the supernumerary tooth as well as how long it took to erupt.**Article 3 - Nazif:**This study emphasized the importance of early supernumerary removal when interfering with normal tooth eruption. It also touched on the complications that can result from supernumerary removal, which were minimal.  |
| **Article(s) Synopsis:** |
| **Article 1: Gupta**This study described 4 different cases of patients with reported supernumerary teeth. It described how although it is in the patient’s best interest to have their supernumerary tooth removed as soon as possible, there are instances where treatment may be delayed. Moreover, the study touches on the perspective of the child’s parent when a dentist is recommending a surgical procedure that may not be causing any immediate problem. It must be emphasized to them that an untreated supernumerary tooth does have the chance of possibly becoming cystic, expanding considerably, and even formation into an ameloblastoma. The study also described the advantages and disadvantages of both early and delayed intervention. An advantage of early intervention may sometimes be preferred to take advantage of the spontaneous eruptive potential. A disadvantage of early intervention was the possibility of damage to adjacent teeth causing vitality and root malformation issues as well as psychological effects on the child. On the contrary, the reason a practitioner may opt for delayed intervention may be to wait for the child to be old enough to be able to tolerate a dental procedure as well as avoiding the removal of supernumeraries while the child is still in the primary dentition. This is due to the possible risk of displacing the permanent tooth during the procedure. There are also disadvantages of a delayed intervention consisting of reduced eruptive forces of adjacent teeth, loss of arch space, and also a midline shift. Many factors need to be taken into consideration when planning surgical intervention of a supernumerary tooth. **Article 2: Mitchell**Methods: * 96 patients (62 male, 34 female)
* 120 teeth total (111 maxillary central incisors, 5 lateral incisors, 2 canines, 1 mandibular incisor, 1 premolar)
* The study only included patients that had undergone a supernumerary tooth removal that was delaying a permanent tooth from erupting.
* Another thing that was looked at was to see whether the degree of the displacement of the unerupted tooth affected the time it took for it to erupt. Measurements of the unerupted tooth from the occlusal plane was documented before supernumerary removal and classified as:
	+ Near: within coronal ⅓ root of the adjacent tooth; horizontal displacement: < ½ tooth width
	+ Mid: within middle ⅓ root of the adjacent tooth; horizontal displacement > ½ tooth width, but < 1 tooth width
	+ Far: greater displacement

Results: * In 57 cases more than 1 supernumerary was found
* The type of supernumerary was determined whenever possible:
	+ 20 conically shaped
	+ 70 tuberculates
	+ 8 supplemental teeth
	+ 3 odontomas
* In 96 of the unerupted teeth, the supernumerary was palatally positioned
* In all cases, the supernumerary tooth was extracted
* 77 teeth erupted spontaneously
	+ Median time from removal of supernumerary to the appearance of associated permanent tooth: 16 months
	+ 14 were associated with a conical supernumerary
	+ 47 with a tuberculate
	+ 4 with a supplemental
	+ 1 with an odontome
	+ 11 not possible to classify
* 21 teeth were exposed during supernumerary removal
* 4 permanent teeth were extracted due to failing to erupt after supernumerary removal
* 17 unerupted teeth needed a second operation to be exposed
	+ Median time from removal of supernumerary to the appearance of associated permanent tooth: 30 months

**Article 3 - Nazif**Methods:* 50 patients - ranging from 16 months - 17 years
* In total there were 57 impacted supernumerary teeth
* Patients were referred to Children’s Hospital of Pittsburgh for surgical removal
* Patients were classified based on age, type, shape, and location of the supernumerary

Results: * 30% of samples had various degrees of interfering with eruption
* Relative to the dental arch:
	+ 80% were in a lingual position
	+ 6% were in a labial position
	+ 8% were in alignment
* 6% of the sample had ectopically erupting supernumerary teeth. All of which occurred in patients with cleft palate
	+ 2 of which erupted into the nasal cavity
	+ 1 erupted into the posterior palate
* Surgical complications consisted of:
	+ Perforation into the nasal cavity
	+ Delayed eruption of adjacent permanent teeth
	+ A diastema
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| **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):** |
| I am unable to select levels of evidence and strength of recommendation above. See below for details: **Levels of evidence:**1. Gupta: 52. Mitchell: 53. Nazif: 5**Strength of recommendation**C - Consensus, disease oriented evidence, usual practice, expert opinion, or case series for studies of diagnosis, treatment, prevention, or screening**Article 1: Gupta*** There are advantages and disadvantages of both early and delayed intervention of supernumerary teeth. Moreover, many factors need to be taken into consideration when planning surgical intervention of a supernumerary tooth, such as a child’s age, surrounding structure, and whether or not the child is still in primary or mixed dentition.

**Article 2: Mitchell*** This study determined that if enough time and, more importantly, space was given, the eruption of the permanent tooth will occur in the majority of cases after the supernumerary has been removed.

**Article 3 - Nazif*** Supernumerary teeth are one of the most significant dental anomalies present in both the primary and early mixed dentition.
* In this study, 50 patients were studied before, during, and after the surgical removal of their supernumerary teeth.
* Overall, early removal of these teeth is recommended when they are:
	+ Interfering with the normal path of tooth eruption
	+ Appear inverted or rudimentary
	+ Associated with pathological conditions
* Complications related to removal are not frequent and are typically minor.
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