Critically Appraised Topic (CAT)

Project Team:
8A-1 --- Sorry Dr. T if you are seeing this at an incomplete stage. I understand it comes off as just excuses but getting the case late and having my OS rotation last week definitely made it more difficult to get everything in and done on time. Again, I'm sorry!!
Project Team Participants:
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Clinical Question:
How does the endontic status of a tooth affect periodontal regeneration?
PICO Format:
P:
Patients with previously treated teeth needing periodontal regenerative surgery
I:
Endodontically treated teeth
C:
Non-endodontically treated teeth
O:
Improved probing depths and clinical attachment loss
PICO Formatted Question:
In patients with previously treated teeth does endo affect the outcome of periodontal regenerative surgery when compared to nonendontically treated teeth when looking at probing depths and clinical attachment loss?
Clinical Bottom Line:
Therapy/Prevention questions **"Results indicate that teeth exposed to severe periodontal disease, which have undergone aggressive periodontal therapy, do not have a significant risk of pulpal necrosis."** **"A very infrequent occurrence of pulpal necrosis caused by periodontal breakdown has been reported in the literature."** **"Although it is conceivable that periodontal pathogens may spread through dentinal tubuli or accessory canals, this possibility still remains almost theoretical."** **!!!"Regardless of the histologic healing, the soft tissues maintained their original position, and recession was minimal at the time of observation compared with the 1-year results. It is conceivable that the reduction in pocket depth, achieved by a long junctional epithelium or by a connective attachment together with good plaque control, prevents the bacterial colonization of treated surfaces, thus reducing the most important challenge to tooth vitality."** **"Aggressive periodontal treatment is nonsignificant in determining tooth necrosis both in the short and long term."**
Date(s) of Search:
11/08/2020, 11/14/2020

Database(s) Used:

PubMed

Search Strategy/Keywords:

Periodontal disease, vertical defects, periodontal regeneration, root canal therapy, clinical attachment loss, probing depths

MESH terms used:

Bone regeneration
Periodontal regeneration
Periodontal surgery
Root Canal Therapy
Tooth, Nonvital
Periodontal Attachment Loss
Periodontal Pocket

Article(s) Cited:

1. **De Sanctis, M. Goracci, C. Zucchelli, G. Long-term effect on tooth vitality on regeneration therapy in deep periodontal bony defects: a retrospective study. Int J Periodontics Restorative Dent 2013;33:151–157. doi: 10.11607/prd.1461**

Study Design(s):

1. A retrospective study

Reason for Article Selection:

1. This article evaluated a number of periodontal therapies and their affect on tooth vitality 7-18 years post-treatment. There was no statistically significant evidence that aggressive perio treatment would cause loss of tooth vitality. Our patient does have a RCT treated tooth but evaluation of vital teeth helps establish a good comparison.
2.

Article(s) Synopsis:

"One other relevant piece of evidence from this group of patients was that, although they were all affected by aggressive periodontal disease with severe or very severe bone loss, none of the examined teeth were necrotic at the initial visit. This is quite surprising, since the amount of time that the root surfaces were exposed to bacterial colonization could have been very long while the distance of such an infection from the apical root canal system was minimal."
"Many histologic studies have demonstrated that a deep destruction of the periodontal ligament causes onl minor alteration to the pulpal tissues, if any, until the apical foramen is reached."
"Bacteria invaded dentinal tubules of devitalized teeth much more readily than the tubules of vital control teeth. Moreover, there is great similitude between periodontal and endodontic pathogens. Most bacterial pathogens found in infected accessory canals have

been detected in periodontal pockets as well. These findings support the hypothesis that endodontic-periodontal interrelationships represent a crucial pathway for both diseases."
"This study was conducted to verify whether a long-lasting, localized periodontitis producing very deep (apical third of rooth length) intrabony defects and treatment with complex therapy, including aggressive root planning such as that needed for periodontal regeneration, influence tooth vitality."
"Patients had received prior treatment for an isolated angular bony defect reaching the apical third of the root length, as evidenced by a PA radiograph. The involved tooth had to be vital at the time of surgery, as evidenced by an EPT test and the absence of radiolucency. The following clinical parameters were measured before surgery: probing pocket depth (PPD), recession, and clinical attachment level (CAL). Three surgical techniques were used in the treatment of the angular bony defect: guided tissue regeneration with nonresorbable membranes (47 pts), enamel matrix derivative (34 patients), and bone substitute (56 pts)."
"Teeth that had been treated with GTR had the greatest recession, and the difference was statistically significant. Final CAL gain for the three techniques was 4.26 +/- 1.4 mm for EMD, 4.90 +/- 1.0 mm for GTR, and 5.36 +/- 0.7 mm for EMD plus bone substitute. PPD mean values were lower for GTR compared with Emdogain. Statistically significant."
"The present study presents data from patients affected by localized advanced periodontitis. In fact, for the tooth to be included in the study, bone loss needed to exted to at least the apical third of the root. However, neither the bacterial infection nor the deprivation of cement caused by the thorough root planning executed during the surgery caused pulpal necrosis in a significant number of teeth."
"The x^2 analysis demonstrated that no statistically significant relationship existed between the number of teeth that lost vitality and the surgical procedure performed."
!!!"Regardless of the histologic healing, the soft tissues maintained their original position, and recession was minimal at the time of observation compared with the 1-year results. It is conceivable that the reduction in pocket depth, achieved by a long junctional epithelium or by a connective attachment together with good plaque control, prevents the bacterial colonization of treated surfaces, thus reducing the most important challenge to tooth vitality."

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):
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