

Influence of Apicoectomies on the Subsequent Implant Therapy of the Replaced Tooth

Thomas G. Wiedemann*

Clinical Associate Professor, Oral and Maxillofacial Surgery, New York University College of Dentistry, New York, United States.

Received date: August 10, 2023, **Accepted date:** August 15, 2023, **Published date:** August 18, 2023.

Copyright: ©2023 Thomas G. Wiedemann. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

***Corresponding Author:** Dr. Thomas G. Wiedemann, Clinical Associate Professor, Oral and Maxillofacial Surgery, New York University College of Dentistry, New York, United States.

Abstract

Apicoectomy is still a substantial part of the dental therapy spectrum and has a long-standing tradition as a dental procedure. Whilst nonsurgical retreatment remains the first choice to address most cases with a history of endodontic failure, modern endodontic microsurgery has become a predictable and minimally invasive alternative for the retention of natural teeth. The differences in outcome for endodontic surgery depending on the techniques used in individual studies have been documented by systematic reviews and meta-analyses. However, a key issue arises when a previous apicoectomy fails and the question is asked whether this affects the outcome of a possible later implant therapy to replace the tooth. A review of the sparse available data show that a previous apicoectomy does not support the possible later implant therapy negatively.

Keywords: Apicoectomy, Implant success, Endodontic failure

Introduction

Notwithstanding all recent developments, apicoectomy is still a substantial part of the dental therapy spectrum. The success of the intervention depends on numerous patient-specific and iatrogenic factors. In addition, a variety of tooth-related factors may necessitate surgical retreatment of endodontically treated teeth, including complicated root canal anatomy, the pathophysiology

of the apical pathosis, severe alterations of the root canal anatomy during endodontic treatments, root filling materials, build-ups or posts impossible to retreat or at unreasonably high risks, as well as perforations, resorptions, or root fractures. At the same time, the gathering of robust scientific evidence on these important clinical issues is a challenge.

The success of the apicoectomy includes the preservation of

the tooth, the absence of symptoms and radiographic healing of the bony defect. The first point serves as a basis for calculating the survival rate, all points together serve for the calculation of the success rate. Literature on the prognosis of root tip resected teeth is sufficiently available and by considering the respective follow-up periods (1 up to 10 years), the survival or success rates (47.5 to 91.5 percent) 1-3, 5, 7,8 appear to be acceptable, especially in the light of the fact that an apicoectomy is often the very last treatment option for a tooth before extraction.

In addition to the question of the chance of tooth preservation, patients often ask the question of whether an apicoectomy would have to be expected disadvantages if they later opted for an implant if the apicoectomy fails 11.

Objective

The purpose of this review is to investigate whether a future implant placement would have disadvantages if an apicoectomy fails.

Material and Methods

An electronic search was conducted in the PubMed database. The inclusion criteria were randomized clinical trials, prospective or retrospective cohort studies, and cross-sectional studies performed on humans with at least 1 year of follow-up and published within the last 15 years. The author screened the title and abstract of every article identified in the search in order to establish its eligibility.

Results and Discussion

In fact, the data base on the topic of this article is very thin. The difficulty of a scientific reappraisal and thus also the lack of publications lies in the need for a very high number of cases for both apicoectomy and implant therapy. This can be explained by the difficulty to find cases where, after a first performed and later failed apicoectomy, the patient then actually got an implant at this point and then is evaluated after another acceptable time in follow-up.

For example, in a study by Saleh et al. 10, the screening of 1,241 apicoectomies and over 9,000 implants in a 15-year period have been necessary to end up in only 25 study participants for a retrospective examination to be able to include.

In another retrospective analysis 11 with a follow-up period of five years, the following questions have been tried to be answered:

Does a previous apicoectomy influence the later bone supply and guide it possibly more often to an augmentation? Does it have an impact on implant survival? Does it lead to increased peri-implant bone resorption?

For this purpose, a data set of 816 implants in 598 patients with available X-ray images of the extracted and replaced teeth was used. The treatment cases were divided into a group with apicoectomy (group A) and a control group without previous apicoectomy (group B).

A possible connection between the previous apicoectomy and the necessity of a later hard-tissue augmentation using the bone shell technique or classical block augmentation was statistically investigated. A total of 437 implants (group A: 42, group B: 395) in 309 patients who were diagnosed in the follow-up program were also included with regard to implant survival and peri-implant bone loss. The five-year implant survival rate was calculated using the Kaplan-Meier analysis. Peri-implant bone loss was reduced to X-rays measured up to five years after implant placement. In 11.5 percent of the total population (94 cases), an apicoectomy was performed. In 19.1 percent of cases in group A (with previous apicoectomy) and 26.6 percent of cases in group B (without apicoectomy), a hard-tissue augmentation was performed: the difference was found not to be significant. In the five-year implant survival rate (group A: 96.6 percent; Group B: 98.0 percent) the marginal peri-implant bone loss has been assessed and significant differences between the two groups were not calculated at any time 11.

Completely ossified apical defects usually heal without problems after extraction and play a good role therefore, since they do not play a role for later implant therapy. On the other hand, the curettage of an extraction socket and a prolonged waiting period before implant insertion is highly recommended since bacteria could remain in the bone causing a subsequent development of lesions around the apex of an implant¹². Some studies have even suggested that the most likely cause of retrograde peri-implantitis is an endodontic pathology of the tooth replaced by the implant or adjacent tooth.¹² Ayangco and Sheridan published three cases of implant periapical lesions in patients in whom failure of apical surgery of the teeth had occurred before implant placement^{13,12}.

More problematic are bone defects that are caused by extensive apical osteolytic lesions, without or with almost no vestibular

lamella left. This surgical issue remains unchanged even if the tooth is extracted with a similar remaining bone defect requiring GBR as a differential therapy. Cases with a longitudinal fracture that occurred secondarily (after apicoectomy) are known to lead to unfavorable bone defects similar to 3-dimensional bone defects after extraction. This situation is surgically managed by a GBR procedure as mentioned above.

Conclusion

The sparse available data show that a previous apicoectomy does not support the possible later implant therapy negatively. This applies both to the treatment effort and to the implant prognosis. From the authors' point of view and his personal experience, it is important to ensure that these circumstances are always clearly communicated when obtaining the patients informed consent.

References








1. von Arx T, Jensen SS, Hänni S, Friedman S. Five-year longitudinal assessment of the prognosis of apical microsurgery. *Journal of Endodontics*. 2012 May 1;38(5):570-9.
2. Raedel M, Hartmann A., Bohm S., Walter MH. Three-year outcome of apicoectomy (apicoectomy): Mining an insurance database. *J Dent*. 2015; 43: 1218-1222..
3. Kreisler M, Del Burgo Berzal D, Kemekenidou I, Al-Nawas B. Influence of patient-immanent and –Independent factors on the success of apicoectomy: A 10-year examination. 68. Annual Meeting of the Working Group for Maxillofacial Surgery and 39th Annual Meeting of the Working Group for Oral Pathology and Medicine, 10 - 11 May 2018, Bad Homburg
4. Chércoles-Ruiz A, Sánchez-Torres A, Gay-Escoda C. Endodontics, Endodontic Retreatment, and Apical Surgery Versus Tooth Extraction and Implant Placement: A Systematic Review. *J Endod*. 2017;4:679-686.
5. Kang M, In Jung H, Song M, Kim SY, Kim HC, Kim E. Outcome of nonsurgical retreatment and endodontic Microsurgery: a meta-analysis. *Clin Oral Investig* 2015;19:569-582
6. Kreisler M, Gockel R, Aubell-Falkenberg S, Kreisler T, Weihe C, Filippi A, Kühl S, Schütz S, D'Hoedt B. Clinical outcome in periradicular surgery: effect of patient- and tooth-related factors--a multicenter study. *Quintessence Int*. 2013 Jan;44(1):53-60.
7. Tsesis I, Faivishevsky V, Kfir A, Rosen E: Outcome of surgical endodontic treatment performed by a modern technique: a meta-analysis of literature. *J Endod*. 2009; 35: 1505-11.
8. Serrano-Giménez M, Sánchez-Torres A, Gay-Escoda C, Prognostic factors on periapical surgery: A systematic review. *Med Oral Patol Oral Cir Bucal* 2015; 20: e715-22
9. Venskutonis T, Daugela P, Strazdas M, Juodzbaly G, Accuracy of digital radiography and cone beam computed tomography on periapical radiolucency detection in endodontically treated teeth *J Oral Maxillofac Res*. 2014 Jul 1;5(2)
10. Saleh MHA, Khurshid H, Travan S, Sinjab K, Bushahri A, Wang HL. Incidence of retrograde periimplantitis in sites with previous apical surgeries: A retrospective study. *J Periodontol*. 2021 Jan;92(1):54-61.
11. Al-Nawas, B; Kreisler M; Luhremberg P: „Die Zweite Chance“: Wenn der konventionelle Weg nicht zum Erfolg führt; *Zahnärztliche Mitteilungen*, Ausgabe 1/2023
12. Wiedemann, T.: Clinical approach to retrograde peri-implantitis: Report of a case and literature review. *Compend Contin Educ Dent* 2021; 42(4) p 164-169
13. Ayangco L, Sheridan PJ. Development and treatment of retrograde peri-implantitis involving a site with a history of failed endodontic and apicoectomy procedures: a series of reports. *Int J Oral Maxillofac*

Implants. 2001 ,16(3):412-417.



© The Author(s) 2023. This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. The Creative Commons Public Domain Dedication waiver (<http://creativecommons.org/publicdomain/zero/1.0/>) applies to the data made available in this article, unless otherwise stated.

Ready to submit your research? Choose RN and benefit from:

-  Fast, convenient online submission.
-  Thorough peer review by experienced researchers in your field.
-  Rapid publication on acceptance.
-  Support for research data, including large and complex data types.
-  Global attainment for your research.
-  **At RN, research is always in progress.**
-  **Learn more:** researchnovelty.com/submission.php

