MedCrave
Step into the World of Research

Journal of Dental Health Oral Disorders & Therapy

Review Article

Open Access

CrossMark

# Endodontic retreatment v/s implant

## Abstract

One of the most popular current debates covered by dental associations is the comparison of the endodontics retreatment's outcome with that of the implant treatment's, taking into account the patient's best interest. With the advent of new endodontics' technologies and the struggling of implant innovations to achieve and maintain high search results rankings, Data analysts are facing more difficulties when performing meaningful cross-study comparison. Accordingly, this literature review aims to answer one of the principal questions addressed by risk-benefit analysis of two long term treatments, that is "How safe, is safe enough?"

**Keywords:** implant, root canal, retreatment, success rate, NiTi, study, evolution

Volume 9 Issue 3 - 2018

Sarah Salloum,[1] Hasan Al Houseini,[1,2] Sanaa Bassam,[1] Valérie Batrouni[1]

[1]Department of Endodontics, Lebanese University School of Dentistry, Lebanon

[2]Department of Forensic Dentistry, Lebanese University School of Dentistry, Lebanon

**Correspondence:** Sarah Salloum, Department of Endodontics, Lebanese University, Lebanon, Tel 0096170600753, Email sas.salloum@gmail.com

**Received:** May 24, 2018 | **Published:** June 25, 2018

## Introduction

"There are living systems; there is no living matter", Jacques Monod.[1] Dental practice system is a framework that is based on the belief that teeth's ultimate treatment can be best chosen in the context of intervening relationships between themselves and between them and other systems, such as the periodontal system and the facial system, rather than in isolation. The question that keeps on bursting is: which is the best to choose between root canal retreatment and implants without misleading the patients? In this paper, an attempt is made to answer this query. Many previous studies have been carried out, and various authors, mostly endodontists (Cohen et al. 2005), reported that the survival rate of implant and endodontic retreatment are both the same.[2,3] However, the latest findings, related to this subject, were mainly directed to the consideration of patient needs and clinical expectations.[4]

### Implants v/s retreatment

In today's world, implants have become a complex biomedical system that includes, not only research, design, and crafts, but also manufacturing, marketing, and measuring. If most of their studies show an evidence of easy treatment procedures with high success rate, how wouldn't it be not complex?![5] By the same token, Implant innovations with sophisticated 3-D imaging and "virtual treatment planning" software have been crushing dreams , providing the easiest treatment with the best outcome a patient can get. "All-on-4" technique enables a patient to receive an entire row of teeth all in the same day. Above all, every clinician, regardless of gender, age and medical history, could be an implant candidate (Moss 2015).[6] Thus, these new clinical techniques had assisted in increasing the precision and maintaining the dental implant success rate.[7] Many authors just as Lazzara et al.,[8] Schnitman et al.,[9] Romanos et al.[10] and Simonis et al.[11] reported subsequently that the survival rate for implants, whether immediate or delayed, has an average of 93%.[12] Several retrospective articles appraised the survival rate of implants performed on a variety of candidates, including smokers, diabetic participants and some representing periapical lesions as well.[13–15] The only conclusion that was revealed is that an insignificant percentage difference was detected when comparing those patients to the healthy ones. Admittedly, the profit and the high success rate of implant's treatment wouldn't influence the decision of an implantologist. From their perspective, the decision to replace a root-canal-treated tooth, or teeth, with dental implants will depend on many factors, including the reason for failure, the integrity of the tooth and its roots, and the patient's overall health, both oral and general—and, importantly, what may be involved in a root canal re-treatment. Saving a tooth was always a target for implantologists.[3] As an illustration, a decision-making chart was introduced by Avila et al in 2009.[16] To help clinicians make a better choice, the color-based chart was divided into six levels including the factors and variables that can influence the final decision to save or extract a tooth:

1. Initial assessment such as patient expectation and Esthetics
2. Periodontal disease severity (Mobility)
3. Furcation involvement
4. Etiologic factors
5. Restorative factors
6. Other determinants.

The decision of the treatment plan is attempted by a sort of calculation (Figure 1), (Figure 2), (Figure 3) & (Figure 4)

Nevertheless, new technologies (NiTi instruments, Irrigation modalities) were introduced to a conservative section of dentistry, which led to a fast significant evolution of root canal retreatment.[17] This latter stimulated the transition from the world of macro-dentistry to detailed world of micro-dentistry inducing a revolution in the endodontic history such as "microscope".[18] Markedly, Carr and Castellucci (1992) Stated that the increased magnification and the coaxial illumination provided by the microscope have enhanced the treatment possibilities in non-surgical and surgical endodontics. Treatments that were not possible in the past have become reliable and predictable.[20] Equally important, the launch of Laser in endodontic treatment improved the quality of canal preparation and enhanced the bacterial elimination.[18,19] Numerous studies reveal the importance of this latter by reflecting his capability to eradicate the resistant bacteria in root canals the "E. Faecalis" that may be tougher than previously thought.[21–24] Traditional mechanical-chemical enlargement lead to Bacterial reduction, however, a recent discover forces us to reevaluate this simple picture; surprisingly, chemicals used in root canal treatment "RCT" (Chloroxedine, Sodium hypochlorite...), which allow the adherence of E. Faecalis to collagen, may be the direct reason for this resistance.[25] Gradually, The innovation of "MTA" (Dental root repair material) was able to turn what was known as impossible, to possible. Celikten et al.,[26] showed that MTA

suggested a good long-term outcome when used in root-fractured and luxated teeth (Complicated cases that might be considered as contra indication of root canal treatment).[27] A literature review of Brett Gilbert (2012), proclaimed that this latter, whether with or without periapical lesion, ranged between 85%-93%.[28] His work was referred to 112 prospective studies over 5 years done by endodontist such as Sjogren et al.;[29] Farzaneh et al.[30] Consequently, in front of such similarity and regardless of patient's need the most profitable easy treatment is to be chosen. This statement has been validated by David Corless-Smith, of the Dental Law Partnership claiming:" The irony is that dentists have opted for replacing damaged teeth with implants because they saw this as being "Cautious".[31] In fact, some papers[32] have often involved reporting misinterpretations of the treatment plan, and misapplications of implant techniques by general practitioners, without consideration of patient's sake. The risks of this approach may appear eventually when dentists start to make continuous unjustified and potentially misleading diagnosis as well as misinformed decisions about how and even whether to proceed to other treatments. In the dental field, treatment varies depending on the condition of tooth and the characteristics of the patients. Matching treatment settings, interventions, and services to an individual's particular problems and needs is critical but potential in order to re-give the oral cavity its normal functioning and its esthetic aspect. Hence, dentist should reach all the information needed to think twice before sacrificing a tooth for their interests.[33] According to the periodontologist Froum et al.,[34] the worst case scenario witnessed in endodontic retreatment is the occurrence of reversible injuries of the mandibular nerve. Yet, this barricade is considered minor when being compared to the ones resulting from different procedures. From this point, it is concluded that the RCT is a safe mode for treatment of damaged tooth unconcerned about patient medical condition.[34] In spite of all of that, a lack of long-term papers discussing the metal-related complications of NiTi alloy has undermined the reliability of these biomaterials, and set inevitably usage limits for general practitioners.[35] Furthermore, while some researchers have focused only on the quantitative part, other work has sought to discuss the high value of existing teeth. Chandki et al.[36] & Harrison et al.,[37] all argued that finding methods to preserve natural teeth is the first step a dentist must take. From another perspective, the way you look affects the way you feel. For this reason, many papers have emphasized the psychological consequences of tooth loss such as embarrassment and other social impacts.[38–40] On the other hand, few studies was conducted for the investigation of the importance of teeth's periodontal ligaments. The results were clear that it is very useful, functionally and technically speaking, to preserve natural teeth as a better oral tactile element due to the existence of proprioceptive receptors.[41,42] Researchers are carried out with the goal to clone the periodontal ligaments through tissue cell engineering for a better implant integration.[43–45] Preserving a damaged tooth must be preceded by a case evaluation.[46,47] According to The Endo blog (2012), dentist should consider many factors before deciding a retreatment like: The quality of the initial treatment, the possibility to be performed under microscope, the restorability of the tooth functionally and aesthetically, and the level of expertise of the clinician. If these things can be improved upon with retreatment, then Dentist can proceed the Treatment plan blindfolded.[48] All of the stated data is summarized in the Table 1 inserted below

| | Implant | Retreatment |
|---|---|---|
| Success Rate | 90% - 93% | 85% - 93% |
| Complications | Surgical complications : Nerve Injury | Minor complication |
| Functional Behavior | Implants are functional into a certain limit<br>Over load will affect the osseointegration so implant failure | Protection of its periodontal ligaments<br>Conservation of tactile sensation |
| Others | | Better psychological effects |
| Contra Indications | Aesthetic? Periodontal condition? General condition? | Tooth Restorability? Endodontist Experience? Reason of first treatment's failure? |

Table continued

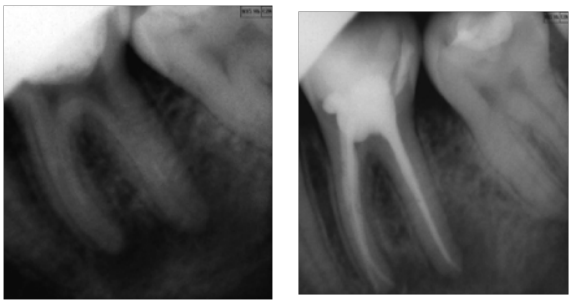

**Figure 1** Fractured instrument.

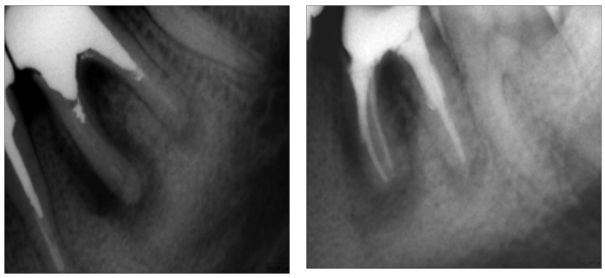

**Figure 2** Excessive bone resorption.

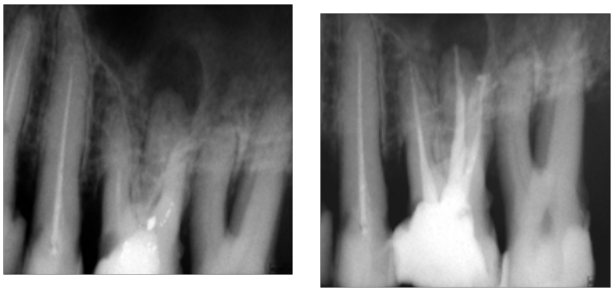

**Figure 3** Bone resorption.

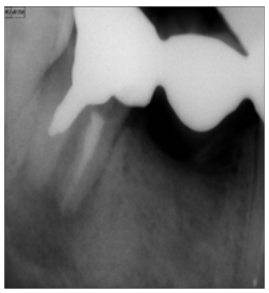

**Figure 4** Tooth with huge bone resorption and large post cannot be saved. Replacing the tooth with an implant would be the perfect treatment choice.

## Conclusion

When choosing the right treatment for the patients, the options available to them depend on Dentist liability. That's why it is quiet important to realize that preserving a natural tooth is periodontologists' choice as well (mentioned in the table above). Henceforth, dentistry

fields are not to compete, but to complete. Correspondingly, the moral duty constrain the dentists to act in ways that aim to maximize patients' satisfaction and to minimize their deception.[49] To sum it all up, dental implants are modern dentistry's best option for replacing missing or restorable teeth but not damaged ones.[50] Preserving a natural tooth must be and always will remain a dentist's priority. With all the new endodontic innovations and aesthetic techniques, root canal retreatment should be a dentist's first choice for saving what we called a "vital organ".

## Acknowledgements

None.

## Conflict of interest

The author declares that there is no conflict of interest.

## References

1. Deamer W. *First Life: Discovering the Connections between Stars, Cells, and how Life Began. University of California press. 2012:286.*
2. Cohen S, Hargreaves K. *Pathways of the Pulp. Mosby. 2005*;25:665−682.
3. Ganz Scott, Trope Martin. Things to consider when making this important dental decision. Endorsed by Endodontics Association; 2015.
4. Carrotte. Endodontics part 2: diagnosis and treatment planning. *British Dental Journal. 2004*;197(2):231–8.
5. *A Dentist's Guide to Implantology*. ADI. 2012;1(1):1−42.
6. Moss Steven. The Evolution of dental implant. U.S. News; 2005.
7. Gaviria L, Salcido JP, Guda TL. Current trends in dental implants. *J Korean Assoc Oral Maxillofac Surg.* 2014;40(2):50−60.
8. Lazzara A, Siddiqui A, Binon P, et al. Retrospective multicenter analysis of 3i endosseous dental implants placed over a five-year period. *Clinical Oral Implants Research Journal. 1996*;7(1):16−21.
9. Schnitman P, Wöhrle PS, Rubenstein JE, et al. Ten years results for Bränemark implants immediately loaded with fixed prostheses at implant placement. *Int J Oral Maxillofac Implants*. 1997;12(4):74−8.
10. Romanos GE, Froum S, Hery C, et al. Survival rate of immediately vs. delayed loaded implants: Analysis of the literature". *Journal of Oral Implantology.* 2010;36(2):315−324.
11. Simonis P, Dufour T, Tenenbaum H. Long-term implant survival and success: a 10-16-year follow-up of non-submerged dental implants. *Clin Oral Impl Res*. 2010;21(7):772−7.
12. Moraschini V, Poubel L, Ferreira V, et al. Evaluation of survival and success rates of dental implants reported in longitudinal studies with a follow-up period of at least 10 years: a systematic review. Int J Oral Maxillofacial Surg. 2015;44(3):377−88.
13. Levin L, Hertzberg R, Har-Nes S, et al. Long-term marginal bone loss around single dental implants affected by current and past smoking habits. *Implant Dent*. 2008;17(4):422–9.
14. Bell CL, Diehl D, Bell BM, et al. The immediate placement of dental implants into extraction sites with periapical lesions: a retrospective chart review. *Journal of Oral Maxillofacial Surgery.* 2011;69(6):1623−7.
15. Rajashree D Jadhav, Ajay V Sabane, Paresh V Gandhi, et al. Dental implant in diabetic patients: Statement of facts. *Indian Journal of Oral Science.* 2015;6(2):340−345.
16. Avila Gustavo, Galindo-Moreno Pablo, Soehren Stephen, et al. A Novel Decision-Making Process for Tooth Retention or Extraction. *Journal of Periodontology*. 2009;80(3):476−91.
17. Ruddle Clifford J. New directions in endodontics. *Dentistry Today.* 2000;21(2):74−81.
18. Mittal S, Kumar T, Sharma J, et al. An innovative approach in microscopic endodontics. *J Conserv Dent*. 2014;17(3):297−298.
19. Kouchi Y, Ninomiya J, Yasuda H, et al. Location of streptococcus mutants in the dentinal tubules of open infected root canals. *J Dent Res.* 1980:59(12):2038−2046.
20. Carr GB, Castellucci A. The use of the operating microscope in endodontics. J *Calif Dent Assoc.* 1992;20(11):55−61.
21. Klink T, Klimm W, Gutknecht N. Antibacterial effects of Nd: YAG laser irradiation within root canal dentin; *Journal of Clinical Laser Medicine and Surgery.* 1997;15(1):29−31.
22. Farge P, Nahas P, Bonin P. In vitro study of a ND:YAP laser in endodontic retreatment. *J Endod.* 1998;24(5):359−63.
23. Stuart CH, Schwartz SA, Beeson TJ, et al. Enterococcus faecalis: its role in root canal treatment failure and current concepts in retreatment; *Journal of Endodontics.* 2006;32(2):93−8.
24. Sadık B, Arıkan S, Beldüz N, et al. Effects of laser treatment on endodontic pathogen Enterococcus faecalis: a systematic review; *Photomedicine Laser Surgery.* 2013;31(5):192−200.
25. Rahimi S, Janani M, Lotf M, et al. A Review of Antibacterial Agents in Endodontic Treatment. *Iran Endod J*. 2014;9(3):161−8.
26. Celikten B, Feriha C, Safaralizadeh R, et al. Multidisciplinary approach for the treatment of horizontal root-fractured maxillary anterior teeth. *Case Reports in dentistry. 2014*;1−7.
27. Nasseh Allen. The Evolution of Endodontics Advancements in endodontic techniques have helped both the efficacy and efficiency of this critical treatment modality. *Inside dentistry Journal.* 2011;7(6).
28. Brett E Gilbert. Endodontic retreatment: achieving success the second time around. *Endodontics Asia Pacific.* 2012;46(1):11−2.
29. Sjogren U, Hagglund B, Sundqvist G, et al. Factors affecting the long-term results of endodontic treatment. *J Endod*. 1990;16(10):498−504.
30. Farzaneh M, Abitbo S, Lawrence H, et al. *Treatment outcome in Endodontics*. *J Endod*. 2004;30(5):302–309.
31. Feinmann Jan. Why teeth implants may be the most painful (and costly) mistake of your life. *The Daily Mail Newspaper*; 2014.
32. Fleming Padhraig. Why is Retreatment Less Successful than Conventional Root Canal Treatment? *TSMJ*. 2002;3(1):31−5.
33. Ethics: The 5 promises ADA dentists make to their patients. ADA; 2015.
34. Froum Scott, Summerford KL. Implant complications: multiple treatment modalities; few financial options. *Dental Economics* 2014;106(8):80−2.
35. Mickiewicz M, Chojnacka K, Wozniak B, et al. Release of metal Ions from orthodontic appliances: an in vitro study. *Biol Trace Elem Res.* 2011;46(2):272−280.
36. Chandki R, Kala M. Natural tooth versus implant: a key to treatment planning. *J Oral Implantol.* 2012;38(1):95−100.
37. Laird Harrison. Natural is better: teeth last longer than dental implants. *JADA*. 2013;144(10):1119−1133.
38. Davis DM, Fiske J, Scott B, et al. The emotional effects of tooth loss: a preliminary quantitative study; *British Dental Journal.* 2000;188(9):503−6.
39. Misch C, Perel M, Wang H, et al. Implant success, survival, and failure: the international congress of oral implantologists; *Implant Dent. 2008*;17(1):25−28.

40. Okoje VN, Dosumu OO, Alonge TO, et al. Tooth loss: are the patients prepared. *Niger J Clin Pract.* 2012;15(2):172−5.

41. Palmer Richard. Dental implants: Teeth and implants. *British Dental Journal*. 1999;187(1):183−188.

42. Tokmakidis K. Load distribution and loading concepts on teeth and implant. *JDI*. 2009.

43. Dabra S, Chhina K, Soni N, et al. Tissue engineering in periodontal regeneration: a brief revie. *Dent Res J.* 2012; 9(6): 671−80.

44. McCormack S,Watson P, Fagan M, et al. The Biomechanical function of periodontal ligament fibers in orthodontic tooth movement. *PLoS One*. 2014;9(7):1371−1381.

45. Gulati M, Anand V, Govila V. *Periodontio-integrated implants: A revolutionary concept. Dental Res J.* 2014;11(2):154−162.

46. Torabinejad M, White SN. Endodontic treatment options after unsuccessful initial root canal treatment: alternatives to single-tooth implants. *J Am Dent Assoc.* 2016;147(3):214−20.

47. Sivakumar A, Thangaswamy V, Rav V. Treatment planning in conservative dentistry. *Journal of Pharmacy and BioAllied Sciences.* 2012;4(2):406−409.

48. Jason J. Hales. Root canal retreatment or implant?. *The Endo Blog*. 2012.

49. Mathur S, Chopra R. Ethical issues in modern day dental practice. *Online Journal of Health Ethics*. *2012*; 8(2):1−12.

50. Hebel K, Gajjar R, Hofstede T. Single-Tooth Replacement: Bridge vs. Implant-Supported Restoration. *J Can Dent Assoc.* 2000;66(8):135−8.

**Citation:** Salloum S, Houseini H, Bassam S, et al. Endodontic retreatment v/s implant. *J Dent Health Oral Disord Ther.* 2018;9(3):245–248.
DOI: 10.15406/jdhodt.2018.09.00385