

Treatment Choice of Dental Implants Over Endodontic therapy – worth the Risk?

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Abstract : *Dentistry has evolved tremendously in the past decade and various treatment options available have left the dentists flustered, so as to choose the best treatment option. Dental Implants are currently very popular and have garnered a good survival rate as well. But preservation of natural teeth through endodontic therapy has always been given priority and provided better success rates in the long run. Thus at times, it could be a dilemma for the dentist to choose between dental implants and endodontic therapy. Hence it is necessary that a thorough evaluation and a common consensus have to be reached to formulate discreet criteria in choosing the treatment options.*

Keywords: *Dental implants , Endodontics, risk factors,*

I. Introduction

As Abraham Maslow has rightly said that when all you have is a hammer, you treat everything like a nail. The same logic can be applied in the case of an endodontist or an implantologist. Every endodontist would prioritize an endodontic treatment whereas an implantologist would consider implant placement as the first option.

All the practitioners who support the furtherance in developing implants, would they do the same if it had to be some other body part. Like for e.g. If there is any injury to any of our toes, we will try our level best to use the most conservative approach for its preservation rather than going for a radical option such as toe amputation and prosthetic replacement. Every tooth has been designed and eloquently positioned in the jaw to maintain a balance of the stomatognathic system. Hence it is of utmost importance that every attempt has to be made in the preservation of teeth till it can serve efficiently.

A root canal treatment compromises the ultimate strength of the tooth and hence it has to be covered with prosthesis to make it resistant to forces of mastication.[1] This scenario can be compared to a fractured hand which has been augmented with a metal rod to allow fracture healing but the option of arm amputation and replacement with a prosthesis is a complete contraindication. Reason being that, even if compromised, innate body part is the best option and nothing could be as efficient as it. Self-preservation is the first law of nature and it has to be respected.

As Hubert Spencer as rightly said that the preservation of health is our duty while only few seem to be conscious about something called as physical morality. Brånemark introduced dental implants in 1977 as a replacement for missing teeth, which would be restored by removable prosthesis otherwise. However with further research in the field of dental implantology, the applications were expanded to cater a larger number of teeth that would be otherwise treated by restorative procedures including endodontics. It has been identified that in most of the clinical trials the reason for the tooth extraction before single-tooth implant placement has not been stipulated and consequently the specific indications for implant placement have not been clearly outlined.[2]

In most of the cases, endodontic complications, trauma and caries were cited as the core reasons for tooth extraction prior to implant placement but it was only in less than 9% of cases that actual endodontic failure led to extraction.[3] The presence of apical lesion has been largely implicated as a reason for extraction of teeth without further treatment with nonsurgical or surgical endodontics.[4] Many conventional treatment options have been grossly neglected after the advent of implants. To name a few, post and core, bicuspidization, root amputation, gingivoplasty, orthodontic extrusion. All the above-mentioned modalities if used appropriately for a designated case can definitely prove to be more efficient and economic. Implants are also popular among the masses in treatment of horizontal root fractures, which would otherwise heal on its own uneventfully or would show favorable response to endodontic treatment. Thus it can be noted that endodontic treatment and implant placement are having a large intersection in the indication for treatment due to lack of well-defined guidelines.

Endodontics is a highly predictable treatment modality in preserving teeth that would otherwise require extraction.[5] Considerable progress has been made in restoring oral function but considerably less progress has been made in identifying the best strategies for selecting one treatment approach over another and currently no guidelines have been set forth by dental profession regarding endodontic versus implant therapy. [6]

The treatment decisions have to be made by the dentist respecting the opinion of the patient, also in regards to general health and special oral needs. The treatment devised should be predictable, safe, economic and respectful of patient preferences based on evidence-based research. Thus it will allow sagacious integration of systemic evaluation and clinically appropriate methodical evidence related to patient's oral and medical condition.

Endodontic treatment is termed successful when there is no evidence of pathology clinically as well as radiographically whereas an implant treatment is considered successful based on its survival only.[4] Unlike implants, endodontic treatment is aimed to cure existing disease and prevent occurrence of new disease. According to studies, both modalities of treatment have success rate of 94%.[7] These figures could be highly misleading if not interpreted correctly.

According to Salinas et al[8] implant success criteria are not routinely applied in much of the implant outcome literature. Also the use of cement success criteria in implant studies render higher success rates while stringent criteria employed in root canal treatment studies may lead to lower success rates [9][10]. The difference in measurement of success in implant and endodontic treatment can lead to bias, thus affecting the overall treatment planning strategy. Also endodontic cases not restored with crowns are more likely to undergo extraction, including such teeth in the study can reduce the success rate of endodontic treatment [11]. Another reason which has reduced statistically positive results of endodontic treatment is because the studies were carried out on patients by a plethora of dental professionals including general practitioners and students in 63% cases whereas implants were placed by specialist in 87% cases. Thus reduced quality of treatment can further reduce the success rates of endodontic treatment statistically. There are high chances of existence of publication bias because in most of the studies a particular company of implant is evaluated whereas endodontic treatment is generic.

To add to it, in only 13% of implant studies the evaluator was different from the operator whereas in 88% endodontic studies had independent evaluators. It has been confirmed that there is a bias in outcome of implant studies by dental literature.[12]

Thus minor issues of endodontic treatment outcome have lead to tooth extraction and implant placement delusioned by the currently available evidence. A fair comparison between endodontic treatment and implant therapy can assist a dental practitioner in formulating a treatment plan which will satisfy all the required criteria. So lets pitch some light into this area!

Apart from the higher success rates offered by root canal treatment, the crowns placed over natural teeth have significantly better aesthetic value as compared to single tooth implants.

Anterior teeth with thin periodontal biotype are best treated with endodontics followed by crown placement rather than implant therapy, as there are high chances of gingival recession and aesthetic failure. There is also substantial bone loss associated with implants especially in the first year of placement with an additional 1 mm apically which is not seen in endodontic treatment. Implant procedures take a lot of time for healing and final prosthesis placement as it depends upon body's response to either accept or reject the implant. Root canal treatment is a relatively ingenuous procedure as compared to implant placement. The treatment cost of implant procedure is approximately 75 – 90% higher than conventional root canal treatment. Prosthetic complications are higher in relation to implant treatment.[13][4] The postoperative care for implants is more as compared to root canal treatment.[14]

There are certain special conditions in which implant placement will have to be done with utmost precaution. Implant placement in the "esthetic zone," especially in the anterior maxillary region, could be significantly challenging due to concerns of high esthetics. Implant survival rates are lower in the posterior maxilla compared to other areas. Proximity to important anatomical structures poses a definitive challenge for implant placement. The space between two teeth and the proximity of the implant to the adjacent roots should be meticulously calculated to prevent any future complications. Poor bone quality ominously reduces survival rate of dental implants. Host bone serves as a better template for implant survival as compared to graft bone. Post-menopausal women with osteoporosis are at a higher risk of implant failure. Inability to maintain oral hygiene is associated with low rates of implant success.

There are no absolute systemic contraindications to root canal procedure but in case of implants the following conditions could relatively affect the prognosis of implant procedure: smoking, history of aggressive periodontitis, acute infectious diseases, cancer therapy, severe psychosis, depression, pregnancy, immature cranial growth with incomplete tooth eruption, diabetes, type IV bone, bruxism, preloading failure, hemophilia, bisphosphonate therapy, renal failure, corticosteroid treatment. Hence case selection is a crucial factor for implant placement.

Criteria necessitating extraction over root canal treatment should be done in case of teeth with questionable prognosis and those with multiple pre-treatment requirements should be excluded as abutments under fixed crowns to reduce the risk of survival of the restoration. Teeth which cannot be restored post endodontically are justified by extraction. Those teeth with evidence of vertical fracture or horizontal root

fracture with poor prognosis should be considered for extraction rather than continuing with endodontic treatment. The post-operative factors that can negatively affect survival of endodontically treated tooth are absence of a cast restoration and absence of proximal contacts.

The decision to treat a tooth endodontically or to place a single-tooth implant should be based on criteria such as prosthetic restorability of the tooth, quality of bone, esthetic demands, cost-value ratio, systemic conditions, potential for adverse effects and patient preferences. The experience and expertise of the practitioner also exercises a pivotal role in both the decision taken and the practicalities of the treatment plan.

It can be concluded that endodontic treatment of teeth represents a feasible, practical and economical way to preserve function in a range of cases and that dental implants serve as a good alternative in selected indications in which prognosis is poor.

Surprisingly there are no well-defined guidelines regarding case selection for implant procedure over root canal treatment. Perhaps a joint meeting of endodontists and implantologists can be conferred so that a consensus can be reached regarding guidelines for implant placement over root canal treatment. Once this has been achieved the perplexity in devising the best treatment plan among the dental fraternity will be highly simplified thus improving the prognosis of treatment and benefiting the populace.

Well, in our present society our patients are aware and have higher expectations regarding the treatment that they receive. With recent advances in technology, dentistry has been able to cope up with problems which were earlier considered to be impossible to treat. This has certainly improved the health and lifestyle of the patients in a positive way.

The treatment offered to the patient should have the patient's best interests and health as a primary goal. The treatment must be delivered in a predictable way to optimize the healing potential and ensure success of treatment. Nonsurgical root canal therapy results when carried out precisely have a very high rate of success and can be the best option a dentist can provide for the patient. As practitioners we should have a clear conscience, without considering the economic benefits offered by other treatment strategies, we can ensure the highest quality treatment by honestly assessing the case difficulty, skills involved, inventory required and consider the case for treatment or referral for specialist consultation. Addressing patient needs should be the essential goal of treatment and improving the general health and well-being of the patient.

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