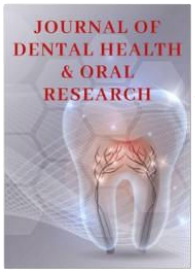

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Editorial

Permanent Implants the Permeant Solution to Losing Teeth?

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Editorial

Dental implants are a reliable and successful method of replacing missing teeth in the adult dentition helping to improve function, aesthetics and mental well-being. Some patients describe it as life changing and their self-esteem greatly improves. Teeth have become not only a functional but aesthetic concern. As dentists, we must be prudent not to develop a mindset of outlet aesthetics for teeth at the detriment of the natural dentition.

The survival rate over 10 years is in the range of 96.4% according to Howe, et al., [1]. The prediction intervals were between 91.4% and 99.7%. The over 65 age group had a lower success rate than the younger age groups partly due to the slower healing response. Howe, et al., found a survival rate of 85% in implant retained full arch patients with an average pre failure functional load of 7 years. Clinicians and patients often expect dental implants to integrate successfully on the first attempt though this is not always achieved. They also expect implants to be complication free for many years without maintenance. This is not the case. Sometimes uncomfortable conversations with the patient must be had on several occasions to ascertain that they are fully aware of the lifespan and maintenance required to increase longevity of a dental implant.

Implant survival is not the same as implant success. Implant survival is purely the implant still present intra orally. Implant success represents lack of signs and symptoms of pain, inflammation and bone loss. Research has shown that 22% of all implants placed experiencing peri-implantitis at 5 years [2]. The estimations for this can vary, depending on baseline bone probing depths and implant morphology and is complicated by patient factors such as oral hygiene routines, manual dexterity, underlying systemic disease (diabetes) and lifestyle choices such as smoking and vaping.

Given the fact that implants are susceptible to gum disease or periodontal issues and occlusal overload, the importance of maintenance and regular oral hygiene, appointments with hygienist, therapists or dentist will help increase the lifespan and decrease the likelihood of implant failure [2].

Keywords: Dental Implants; dentists; implant failure

Lifespan of Implants

Implants typically last 8 to 15 years and are not permanent. Nothing is truly permanent. Implant failures due to loss of osseous-integration, screw, or fixture fractures require removal after failure. With implant failure comes bone loss. Early failure (within a year) may require simpler procedures such as Guided Bone Regeneration (GBR). Implant failure at a late stage may requires the addition of bone grafts, bone blocks or more complex techniques such as sinus lifts, Khoury plates or zygomatic implants. Many clinicians now think in terms of cycles of implant treatment over time and it is prudent to discuss this with the patient prior to starting treatment. Costings of further reparative work must be discussed with the patient and agreed prior to treatment along with warranty terms and conditions. If a patient fails to maintain their implant restoration and comply with your advice - should the cost and reparative work be carried out by the clinician free of charge? When there is a plethora of reasons an implant may fail, is it solely the clinician's responsibility to assume responsibility for failure. These are mechanical pieces that we are

inserting into a jawbone and like hip joints they have complications and failures (Table 1).

Category	Complications/Factors
Biological	Peri-implantitis/mucositis, Failure to attain osseointegration, Failure to maintain osseointegration, Patient factors: systemic health (e.g., uncontrolled diabetes), smoking and vaping, radiation therapy, Insufficient bone volume/quality Osteoporosis
Mechanical	Implant fracture, Screw fracture, Abutment fracture, Screw loosening, Prosthetic component fracture (e.g., crown/porcelain, denture attachments)
Iatrogenic	Bone overheating, Failure to degranulate site and introduction of soft tissue, Malpositioning in the 3-D plan, Nerve damage/Paraesthesia, Damage to adjacent teeth/structures (e.g., sinus perforation), Retained cement
Functional	Design of prosthesis (e.g., lack of passive fit), Functional overload, Occlusal interferences, Parafunctional habits (e.g., bruxism)
Aesthetic	Soft tissue recession/gingival recession, Unfavourable soft tissue contour/black triangles, Unsatisfactory restoration aesthetics (colour, shape, size, metal show)

Table 1: Reasons for implant failure.

Alternatives to Implant Treatment

Other options to replacing missing teeth should be discussed with the patient initially,

1. Do nothing
2. Partial denture, either in the form of acrylic, flexible or chrome
3. Bridge work, either resin -retained or conventional abutment retained or fixed movable
4. A combination of treatments - conventional crown and bridge work with precision attachments and guide planes alongside side a partial chrome work
5. Dental implants

All are viable options, but on some occasions, it is the authors opinion that dental implantologists choose to restore with implants without taking into consideration the patients' medical history, ability to maintain dental implants and adjacent tooth status. The adage is true - every implantologist sees an implant space; every prosthodontist sees a bridge. Our in-built desire to do surgery and place an implant sometimes clouds our decision-making processes ad biases us towards surgery. The pull of consumerism and possibly ego of the surgeon can drive the process towards surgery as opposed to patients' best interests. This is an ethical dilemma, especially, in cases where patients have some remaining sound teeth, but a full arch implant retained prosthesis is requested by the patient. 76% of the patients would prefer the implant prothesis to be fixed as opposed to removable [3]. This percentage is greater in women than men. Wang, et al., found that the degree of satisfaction was higher in patients with foxed prostheses than with removable, although presence of moderate to severe peri-implantitis brought this rating down [4].

Treatment Planning

Certain factors will need to be considered prior to placement of an implant and maintenance of an implant:

1. The patient must be surgically fit and healthy
2. Prothesis needs to be prosthetically driven
3. Amount and type of soft tissue at the site
4. Additional bone grafting and/or soft tissue grafting techniques if required and patient acceptance of additional surgeries

Careful surgical planning and prosthetic planning will increase the lifespan of the implant and decrease the risk of future complications such as enamel chipping, screw fracture, abutment fracture, implant fracture or untimely implant loss. Koati Ettel, in 2015 mentioned that the likelihood of screw loosening in implant placements after 5 years to be at 35% when looking at 565 patients. This is an inconvenience to the patient but also an inconvenience to the clinician. It may be best, if possible, to replace the internal screw if the tooth continues to loosen.

Failure to not adhere to the guidelines will undoubtedly reduce the lifespan and increase the complication risk. Careful evaluation of the Cone Beam Computed Tomography (CBCT), intraoral scans and digital photography overlaid in a digital smile design treatment planning software can help identify any defects in bone and soft tissue which will needs to be addressed in the planning stage.

The role of dental implants in some situations is invaluable, such as a single tooth implant with sound adjacent teeth mesially or distally, or in the position of Kennedy Class 1 or class 2 with a posterior edentulous ridge [5]. Then the addition of an implant can make the retention of an upper or lower denture more favourable and more desirable/acceptable to the patient. In the maxillary arch though, there tends to be D3/D4 bone making placement of an implant and osseointegration of an implant more problematic [6].

Maintenance and Examination

For a new patient that presents to practice we should initially take

- A baseline X-ray to review bone levels. Like any other implant or any other bone, unfortunately a little bit of bone can be lost, and recession can occur similar to what is found with natural teeth and is rated between 0.2 mm and 1 mm a year. This may be dependent on implant structure, implant pathology, morphology, thread structure and head of implant placement of implant. The type of prosthesis may also affect the progressional bone loss [7]
- Pocket probing depths and signs of bleeding and inflammtion or pus around the implant [8]
- Digital photo of the soft tissue at time of placement, restoration and monitoring to identify any soft tissue changes quickly
- If the patient exhibits bruxism and he/she smokes, then this has been shown to increase the rate of bone loss around implants. There also systemic factors which may be of interest such as diabetes, osteoporosis, some biological drugs such as denusomab and any bisphosphates [9]. There is not enough research yet to make a clear definition on how these will affect implants further down the line. Tin C, Yiu Yan, Leung, 2024 carried out a systematic review of 445 implants and found a 23% failure rate in patients talking antiresorptive medication - 83% of these failures were associated with MRONJ. The review recommended monitoring within the first three years of starting these medications and maintaining good periodontal health [10-13]

Discussion and Conclusion

This paper is a very short delve into the permeant solution to missing teeth that is dental implants. As briefly mentioned, dental implants are not without their failings and do require further commitment from the patient and the clinician to ensure a long and healthy osseo-integrated implant. It is very important to have these conversations with the patient prior to implant placement. The patient must be made aware of factors that may decrease the lifespan of an implant and increase the likelihood of infection or complications and their ownership and responsibility for maintaining the health of the implant must be conveyed and understood fully.

Conflict of Interest

There are no conflicts of interest that may have influenced the research, authorship or publication of the article.

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Ethical Statement
This project was exempt from IRB review as it did not qualify as human subject research under federal regulations.

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