

Periodontist & Implants

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Introduction

Implants.... Changing face of present, assuring better future

We are living in an era which marks the end of the twentieth century; an age when looking young is not only desirable but increasingly possible. It is not enough to say, "Beauty comes from inside". How can one be beautiful with a toothless smile!!

In the recent past, dentistry has progressed in leaps and bounds, and dental implants represent one of the most dramatic advancement of modern dentistry. Implants have become a vital device for the longevity and maintenance of natural appearance and bring a measure of permanence and reliability. Thus, the patients can smile, speak, eat, and laugh, once again, with assurance and confidence.

A number of factors such as optimum oral hygiene, a healthy periodontium, proper implant selection and placement, as well as routine dental check-ups following implant placement play critical role in ensuring the long-term success of the dental implant. The article provides a further brief insight into how a periodontist plays a vital role in successful implant therapy.

Evolution And Selection of The Fittest

The concept of implants can be traced down to thousands of years. Be it iron, wooden, ivory or extracted teeth from other human donors, implants have always been part of dental history, though none of them could stand the test of time.

Strock⁹ finally broke the shackles by placing first successful oral implants in 1937. Since then, there's been no looking back leading to the development of concepts such as the Subperiosteal (**FIG. 1**), the Endosteal blade (**FIG. 2**) and the Ramus frame (**FIG. 3**) implants. The credit for present titanium implants goes to an orthopedic surgeon, **Per Ingevar Branemark**¹, University of Lund, Sweden who laid down the clinical parameters for successful implants at the Toronto Conference on 'Osseointegration in Clinical Dentistry in 1982.

Pre-Surgical Evaluation

A thorough and accurate examination of the soft and hard tissues of the periodontium is of essence to ensure the

success of an implant. Soft tissue should be of adequate dimension as well as consistency and must have sufficient width of keratinised gingiva. An evaluation of the height, width and density of the underlying residual bone is critical since a slight error can make the difference between success and failure. Although various radiographic techniques such as subtraction radiography and CT scan help in the assessment, it must be kept in mind that they are diagnostic aids and not the diagnosis per se. Hence, the knowledge and experience of a periodontist go a long way in achieving the correct diagnosis.

Soft Tissue Management

Doomed is the implant that is placed in an unhealthy environment. Hence, thorough periodontal therapy is mandatory, before implant placement is even contemplated.

Any inadequacies in the soft tissue should be corrected prior to implant placement. Various grafting techniques such as free gingival grafts, connective tissue grafts, etc, have to be performed by the periodontist whenever soft tissue augmentation is required. End result should be a soft tissue having a firm consistency with adequate width of keratinized gingiva.

Regenerative Therapy

If reduced support from the hard tissues is anticipated, various regenerative and ridge augmentation techniques should be instituted. Bone grafting may be performed using an autograft since they provide the best results (**Jovanovic et al, 1992**)³, and can be harvested from an extraoral site such as iliac and rib grafts, or from intraoral sites which include maxillary tuberosity, symphysis and the retromolar region. Alternatively, various materials available commercially may be used, (Meffert, 1992), which include allografts (**DFDBA**), xenografts (**Bovine-Derived Hydroxyapatite**), or alloplastic materials (**Bioactive Glasses & HTR**)[®]. These materials may also be used in combination with GTR membranes (**Lehmann, 1992**)⁵, such as **Tefgen**[®], **Biomend**[®], **Atrisorb**[®], etc. for added advantage. Although under development at present, growth factors are set to revolutionize regenerative

procedures by enhancing bone formation where bone support is severely compromised. Alternatively, distraction osteogenesis (**FIG. 4**), can be performed for ridge augmentation.

The Blue Print

Selection of an implant is critical and depends on a number of factors. For example the bone in the maxilla tends to be of the cancellous type and hence of less density. Furthermore, in the posterior region, maxillary sinus also adds to the limitations, for which sinus lift procedures can be carried out (**FIG. 5**). On the other hand, in the mandible, the bone is of cortical type and hence, dense. Other than this, the thickness and height of the bone, the kind of occlusal loads to be expected, all play an important role in deciding the type of implant to be placed.

Implant Placement

Every periodontist knows the patience and hard work needed to attain that extra millimeter of bone or soft tissue which may be critical to implant survival. The respect a periodontist gives to the hard and soft tissue cannot be equated. The benefits achieved by this can easily be appreciated in the long run as an appropriate osseointegration is achieved only when an implant is placed with the minimum of trauma in a bone that defines good quality and quantity. This acquires greater significance in the light of '**Periosteal Reflection Hypothesis**', according to which any damage to the periosteum compromises the blood supply of the underlying cortical bone, causing bone resorption. Hence, mid-crestal incisions, overlapped incisions, vestibular incisions, and so on should be used with the minimum of trauma to ensure a good blood supply while, at the same Time, maintain adequate tissue thickness and dimension.

Fits Tight Serves Right

Bone and soft tissue interface with implant is a hurdle that needs to be passed successfully. Osseointegration (**Branemark**)¹ is the desired goal in implant therapy. In 1986, the **American Academy of Implant Dentistry** defined osseointegration as "contact established without interposition of non-bone tissue between remodeled bone and an implant

entailing a sustained transfer and distribution of load from the implant to and within the bone.” Implants coated with hydroxy-apatite, collagen, fibronectin and plasma-coated implants have been studied to get the much-required osseointegration. Guided bone regeneration with barrier materials like ePTFE and with bioresorbable collagen membranes are gaining attention since they have the ability allow the differentiation and migration of cells from the periodontal ligament and alveolus.

The Implant Disease

Studies by Gould, (1981) and **Hansson & co-workers, (1983)²** have demonstrated that the peri-implant mucosa is attached to the implant surface by means of basal lamina and hemidesmosomes. However, studies by Jansen & co-workers, (1985) contradict this finding, suggesting that the adaptation of the soft tissues against the implant surface is more a result of tonus than anything else (**FIG. 6**). Furthermore, in case of implants the fibers are arranged irregularly and parallel to the implant body. The implant gingival sulcus in the partially edentulous implant patient exhibits a bacterial flora similar to that of natural teeth. Thus, whenever there is a failure to achieve or maintain a peri mucosal seal, the inflammation can pass to the peri-implant areas without any resistance leading to pocket formation in the bone-to-implant interface, i.e. periimplantitis (**FIG. 7**), a condition similar to periodontitis. In fact, plaque-associated soft tissue inflammation around implants might have more serious implications than marginal inflammation

around teeth with a periodontal ligament and, if untreated, peri-implantitis can rapidly lead to implant failure (**Lindhe, 1992)⁶**.

Management of peri-implantitis should be performed in the same vein as the management of periodontitis because the basic disease process is the same. Non-surgical therapy such as scaling and root planing may be performed with plastic scalers (Thomson- Neal & co-workers) since ultra-sonic scalers have been shown to cause roughening of the metal surfaces of implants (MeschenIlloser & associates). The periodontist should perform regenerative surgical procedures whenever bone loss is encountered.⁴

Follow-Up Protocol

Follow-up care and periodontal requirements for success are similar for dental implants as for natural teeth. To affect optimum home care at the gingival/implant junction, hygiene is most readily accomplished with the use of an interdental brush or a rotary uni-tufted brush.

Maintenance

The combination of rinsing and brushing with anti-microbial begins upon insertion of the prosthesis. Inflammation in the peri- implant mucosa can spread very rapidly. Therefore, a recall visit to the periodontist every 3 months is mandatory to maintain optimum health of the implant, as well as ensure its long-term success. It must be kept in mind that the "implant patient" is a "periodontal patient", and can best be taken care of by none other than the safe and caring hands of a Periodontist.⁷

Conclusion

Dental implants have the potential to replace the missing teeth in a way hitherto thought impossible. Ensuring their long-term success, however, requires an in-depth knowledge of the periodontal structures, experience to determine the accurate diagnosis and treatment plan, the ability and finesse to treat delicate oral tissues with tender love and care, and last but not the least, the commitment to maintain the optimum peri-implant environment. And if there is ever an individual who can perform all these roles with excellence, it's the

Periodontist!

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