prevention of peri-implant diseases

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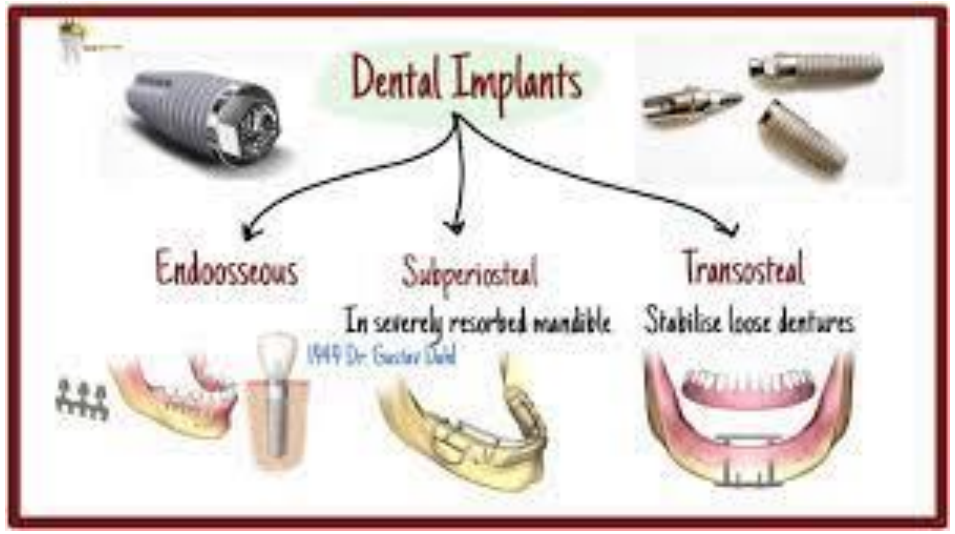
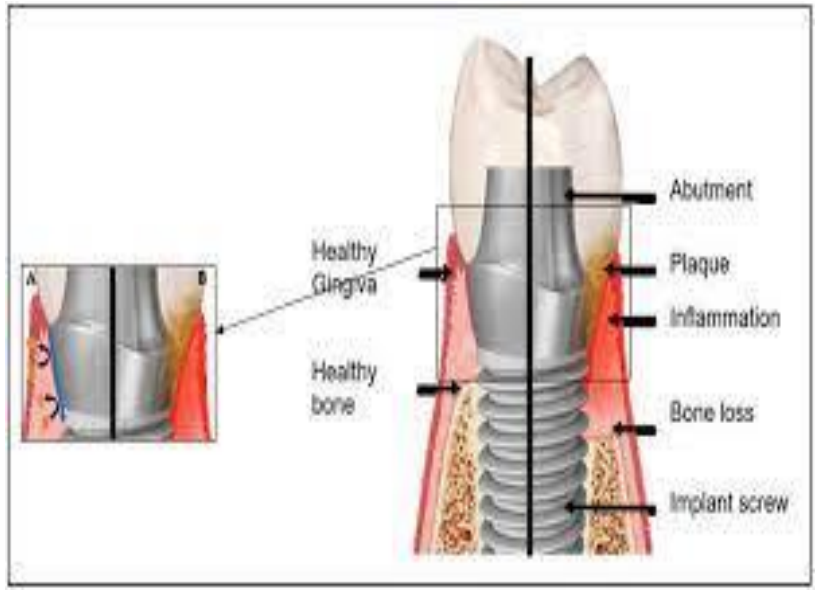
Dental implant is a device that can mimic the tooth root when placed surgically in to jaw bone, and can be used to support crowns, bridges and dentures. There are many types of dental implant the most popular one is endosseous dental implants that have become an important option in treatment plans within dentistry to replace missing teeth. However, implant failure and peri-implant diseases are still a problem facing implantologists

The long term success of an implant is highly dependent upon the ability of the material to integrate with the surrounding bone and connective tissue. Many efforts have been made to develop materials that can accelerate osseointegration, enhance gingival attachment to provide a soft tissue seal that prevents bacterial invasion and resist bacterial adhesion and colonization and/or having bactericidal effects





Topography of the biomaterial surface plays an important role in determining the cellular response .The biological response to a dental implant is determined by a number of physical and chemical features of the implant surface, which include mechanical properties and physicochemical properties (oxide thickness, chemical composition, crystallinity, surface wettability, surface energy, and surface topography). Any interaction between the body tissues and the implant material will be affected by these properties and any changes in one of these groups may affect the other parameters.

Bacterial colonization occurs on a dental implant immediately after exposure to the oral cavity environment. Once bacteria form part of a biofilm they become organized into a complex community that is protected from environmental factors. The effects of anaerobic plaque accumulation on peri-implant tissue health have been documented in several studies, and plaque accumulation has been suggested to be one of the main causes of implant failure.

Dental implants differ from other load-bearing implants such as orthopedic implants because

they cross between two different environments (oral cavity and inside body tissue).
This is a challenging environment and an implant therefore needs to cope with the normal microbiota associated with the oral cavity,
provide a seal to prevent bacterial invasion inside the body,

endure different masticatory forces,
withstand variation in pH and temperature and even galvanic current,
as well as being able to osseointegrate with bone

Implant Maintenanc

Meticulous oral hygiene self-care is essential in maintaining dental implants. Plaque and calculus accumulate more rapidly, in larger amounts and adhere more easily to the implant abutment than to natural teeth. The epithelial barrier and connective tissue attachment mechanism is not as strong around an implant when compared to a natural tooth. This weaker attachment allows for a more rapid bacterial invasion of the biologic seal which can contribute to the destruction of osseous integration. Effective plaque removal is a critical factor in the maintenance of a healthy biologic seal and to prevent implant failure. There is a positive correlation between the amount of plaque and subsequent gingivitis and bone loss around implants.

The loss of natural teeth resulting in the placement of implants is often caused by a history of poor oral hygiene resulting in dental disease. A commitment to meticulous daily oral hygiene self-care is critical for those with implants. Cleaning the abutment posts, bars, and prosthetic superstructures, presents a challenge that can be even more demanding than cleaning natural teeth. As with natural teeth, a combination of devices is usually needed to remove plaque from all surfaces. The goal of implant maintenance is to regularly remove soft deposits without altering the surface of the implants. Damage to implants can increase corrosion and affect the molecular interaction between the implant surface and host tissue. A scratched surface may lead to increased plaque accumulation. The subsequent bacterial invasion can progress rapidly to peri- implantitis and potential implant failure.

An effective brushing technique

should be the first component of an implant oral hygiene self-care regimen.

A soft, manual toothbrush can be used.

A sonic powered toothbrush has been shown to be better than a manual toothbrush in reducing plaque and bleeding scores around implants. Some individuals may prefer a powered rotary brush with a tapered brush-head design. Neither type of powered brush was found to damage the implant surface and both were effective in areas where access is difficult. Whatever brush is used, a demonstration of the adaptation of the brush to the abutment posts and pontics should be provided.

The dentifrice used should ensure that it is not abrasive.

To aid in plaque removal from abutment posts there are a variety of other devices that can be utilized such as:

A tapered or cylindrical shaped interproximal brush or uni-tufted brush can be used with an in-and-out motion to clean the abutment posts. The interproximal brush must have a nylon-coated wire rather than the standard metal wire to prevent scratching the implant with the tip of the interproximal brush.

Foam tips are an alternative choice for cleaning the interproximal surface of an implant. To help control bacteria, the foam tip, interproximal brush, or either of the powered brushes may be dipped into an antimicrobial solution such as chlorhexidine gluconate (0.12%). Alternately, a cotton swab can be used to apply the agent.

Any type of floss, tape, or yarn can be used for circumferential plaque removal around abutment posts. In some cases, traditional floss with a floss threader, variable thickness floss or gauze can be placed in a 360-degree loop around the abutment post and moved with a shoeshine motion in the direction of the long axis of the tooth. Alternately, floss products designed specifically for use with implants can be used. Ribbon floss is a wide, woven, sometimes braided, gauze- like version of floss, which provides increased texture to enhance plaqueremoval. One product has a hook on the end of the floss ribbon to allow for wrapping the floss around an entire post by inserting from the facial aspect, thus eliminating insertion from both facial and lingual surfaces. Placing a small amount of nonabrasive toothpaste on the flossing product can polish the posts.

Oral irrigators can be used for cleaning around abutments; however, the water spray should be used on the lowest setting and should not be directed subgingivally. Rinsing with 0.12% chlorhexidine affected gingival and bleeding indices. The substantivity effect is not as strong for implants as for natural teeth but would be better facilitated by subgingival irrigation than rinsing.

A critical factor in successful implant maintenance as with all oral health self- care is to recommend only the minimal number of cleaning devices needed for effective plaque removal. With proper instruction, the motivated individual can successfully maintain implants.

When the patient with implant attends the dentist, the following features should be checked:

Mobility of the implant: there should be no loose screws or detectable movement of the intra-bony components. Tooth mobility is assessed using two handles of two hand instruments positioned buccally and lingually. The tooth is moved bucco-lingually with the instruments and the degree of movement recorded. This crude system is very subjective but remains the only method in universal use however an electronic device Periotest can be used for measuring tooth mobility, which uses an accelerometer to measure the resistance of the tooth to a force applied

Percussion to implant should give a characteristic hard ‘ring’ if a dull noise is heard, this may suggest that the implant is not integrated with the bone and the patient should be referred back to the implantologist.

Signs of mucosal inflammation and peri-implantitis: peri-implantitis affects the entire circumference of the implant, creating bone loss and inflammatory tissue extending to the bone surface. Any periodontitis associated with natural teeth may have a detrimental effect on implants. It is possible that bacteria

associated with periodontitis, are also important pathogens in destructive inflammatory lesions around implants.
A plastic probe should be used when probing tissues adjacent to implants. However, the probe should not be used to establish probing depths, as this would damage the delicate long junctional epithelial attachment of the mucosa surrounding the implant.
Most of the instruments normally used for cleaning may damage the titanium surface, including ultrasonic and sonic cleaning systems. Plastic-, gold- or Teflon-coated scaling instruments are specifically available for implant management.
It is important to avoid too much pressure when scaling implants, as calculus deposits are not as tenacious as calculus on natural teeth. Scaling needs to be gentle as the junctional epithelium is fragile; the periodontal fibers are not multidirectional, as with natural teeth, but run in one direction only.

Non-abrasive polishing pastes

should be used for polishing, and polishing kits are specifically manufactured for implants. To avoid implant structures being damaged, it is advisable to polish the implant first with a new polishing brush or cup, as this would not have any contaminating residue from previous treatments, and to use an implant polishing paste. The prophylaxis can be completed with more traditional abrasive paste in the remaining areas of the mouth