Dentistry has become so exciting and challenging since predictability has been recognized for long-term dental implant and restoration success. As the number of patients selecting dental implants as a treatment option continues to grow, the dental team must accept the challenge of maintaining sometimes complex restorations.

Proper monitoring and maintenance is essential to ensure the longevity of the dental implant and its associated restoration through a combination of appropriate professional care and effective patient oral hygiene, the value of using conventional periodontal parameters to determine periodontal health being evident in the literature. Therefore, it is paramount that the dental implant team understands the similarities and distinctions between the dental implant and the natural tooth. Subsequent visits are used to examine the similarities and differences between a natural tooth and a dental implant, basic guidelines can be provided for maintaining the long-term health of the dental implant.

Direct anchorage of alveolar bone to a dental implant provides a foundation to support a prosthetic restoration. With the increased acceptance of dental implants as a viable treatment option for the restoration of a partially edentulous or edentulous mouth, the dental profession should concentrate on the peri-implant hard and soft tissues. The peri-implant mucosal seal is visual evidence of soft tissue healing with parallel-oriented collagen fibers adjacent to the body of any implant. This acts as a barrier when inserted in the sulcus. The probe tip advances passing between the fibers of the gingival connective tissue with even slight at-tachment loss or mucositis, root probing of the peri-implant tissue should not be performed.

Clinical inspection for signs of inflammation, ie. bleeding on probing, exudate, mobility, probe-able pockets, and a radiographic evaluation of the peri-implant bone tissue housing still remains the standard mode for evaluating the long-term status of endosseous dental implants. Inability to detect a minimal increase in the peri-implant bone area may indicate a possible failure of osseointegrated implants exhibit no mobility. But, if there is clinically perceivable mobility, then subsequent radiographic evaluation of the implant and its surrounding bone housing, the abutment retaining screw4, and/or prosthetic abutment col-umns should be re-evaluated for looseness or breakage. All of these modes of clinical assessment are used routinely, except for periodontal probing around peri-implant tissues that appear to be in a state of good health, the baseline data and data from previous visits should be recorded in the daily progress notes to properly assess the peri-implant status longitudinally.

Subsequent to a thorough intraoral examination, unless there is visual evidence of soft tissue changes, ie. inflammation, periodontal assessment are used routinely, except for periodontal probing around peri-implant tissues that appear to be in a state of good health, the baseline data and data from previous visits should be recorded in the daily progress notes to properly assess the peri-implant status longitudinally.

Diagnosis and treatment planning based on a risk-benefit analysis should be performed subsequent to a thorough medical, dental, head-neck, psychological, and psychosocial examination.9 There is convincing evidence that bacterial plaque not only leads to gingivitis and periodontal disease, but also can induce the development of peri-implantitis.10,11 Thus, personal oral hygiene must be performed at least once a year to more easily identify the existence of acceptable mobility of the prosthetic components or the implant fixture itself, and the patient's level of home care ef-fективness. Remember that the presence of any symptoms of infection, radiographic evidence of peri-implant bone loss, and/or neoprophathies may be indicative of an ailing or failing implant.12

Implants vs natural teeth
It is essential to understand the periodontal relationship between the gingiva and the structure it attaches to be it a natural tooth or an implant. (Figs. 1 and 2) The fiber orientation of the gingival cuff around a natural tooth attaches perpendicularly to the long axis of the tooth. (Fig. 3) This acts as a barrier when insertion of a periodontal probe within the sulcus. The probe tip advances passing between the fibers of the gingival cuff until the crestal bone prevents it from further advancement.

The peri-implant mucosal seal may be less effective barrier to bacterial plaque than the peri-odontum around a natural tooth, tissue attachment loss is less vasculature in the gingival tissue surrounding dental implants compared to natural teeth. This re-duced vascularity concomitant with parallel-oriented collagen fibers adjacent to the body of any dental implant make dental implants more vulnerable to bacterial plaque than the peri-odontum around a natural tooth, tissue attachment loss is less. During recare appointment, peri-implant periodontal probing should be performed only when signs of infection are present, ie. exudate, swelling, bleeding on probing, infiltrated peri-implant soft tissue, and/or radiographic evidence of peri-implant alveolar bone loss. Lastly, routine peri-implant periodontal probing should not be performed, because this procedure could damage the epithelial cuff around dental implants, possibly creating a pathway for the ingress of periodontal pathogens.14,15 Clinically available plastic probes should be used when investigating the crevicular depth around dental implants. The probing depth around dental implants may be related closely to the thickness and type of mucosa surrounding the implant. A hard biopsy from a peri-implant sulcus has been reported to range from 1.5 to 3.8mm, which is greater than those depths reported for natural teeth.16 In essence, the best indicator for evaluating an implant is visual evidence of soft tissue health.17

For all of these reasons, personnel home care and consistent professional maintenance have proven their critical necessity and longevity of endosseous dental implants. This is especially true in an environment with adja-cent natural teeth, which if affected by periodontal disease, could act as a reservoir for patho-genic bacteria, ie. gram-negative anaerobic rods, and seed the peri-implant sulcus.18

The physical characteristics of the peri-implant soft tissue are the focus of all oral hygiene instruc-tion, without the critical absence of keratinized tissue in this critical area has not been unequivocally documented to state that peri-implant tissues are more vulnerable to the ingress of pathogenic bacteria with or without keratinized tissue being present around dental implants. However, the ability of the patient to maintain good home care around dental implants is facilitated by the presence of keratinized tissue surrounding implants. Thus, if a patient has no keratinized tissue around an implant, and a pull from a frenum or a chronic peri-implant mucositis exists, plaque control using plastic or amorphous or plastic connective tissue graft is recommended to fa-cilitate proper mechanical oral hygiene maintenance.20

Specific criteria for obtaining clinical data around dental implants that would allow proper monitoring and detect early pos-sible failure of osseointegrated dental implants has not been clearly defined. Presently, the presence of mobility is the best indi-cator for diagnosis of implant failure. As opposed to natural teeth, dental implants exhibit minimal clinically undetectable movement because of the absence of a periodontal ligament. Therefore, healthy implants should appear nonmobile, even in the presence of peri-implant bone loss. An adequate amount of sup-porting alveolar bone still exists.21

When monitoring the health of the peri-implant soft tissues, the practitioner should be cog-nizant of changes in tissue color, contour, and consistency. The presence of a fistulous tract indicates the presence of a pathologic process or implant fracture.
Bleeding

There is controversy in the litera-

atur as to the accuracy and sig-

nificance of bleeding upon pro-

bing around dental implants. Pre-

sently, the literature advan-

tages the use of bleeding on pro-

bing as an indicator of peri-implant
disease, because it can occur prior
to histologic signs of inflamma-

tion or concurrently with other

signs of implant failure, ie, bone

loss. However, as previously men-

tioned, routine probing is not rec-

ommended.

Radiographic evaluation

Radiographic interpretation is

one of the most useful clinical pa-

rameters for evaluation of the

survival of an endosseous dental
dental implants. The rationale for

this whole-documented and spoken
clinical indication is that this metal is so

hard it can scratch, contamine,

cause a galvamic reaction at the

implant-abutment interface6,7.

Ideally, hand periostial scalers for cleaning dental im-

plants can be plastic, Teflon, gold-pla-

ted, or made of wood (Figs. 3

and 6). When using gold-plated
curettes, the manufacturer rec-

ommends not sharpening these
gingival instruments, as the gold

surface could be chips off expos-

ing the hand metal underneath

this coating. Stainless steel scal-

ing instruments may abrade the

implant surface, stripping off any

surface treatment such as hy-

droxyapatite (HA) as the instru-

ment hardness is greater then the

titanium alloy the implant is

fabricated from. (Fig. 7)

Other cleaning armamentari-

um contraindicated for use with
dental implants are air poweder

abrasive units, flour or pumice

for polishing, and sonic and ul-

trasonic scaling units8. Ultra-

sonic, piezoelectric or sonic scaler
tips may mar the implants surface

leading to microroughness and

plaque accumulation. The stain-

less steel tip may also lead to
gouging of the implants polished

collar. (Fig. 8) However, some

clinicians advocate using a sonic

instrument with a plastic sleeve

over the tip for scaling dental

implants. Air powder polishing

units may also damage the im-

plant surface and should be

avoided during hygiene appoint-

ments. (Fig. 9) Even the use of

baking soda powder in these

units may strip off any surface

coating on the implant. Addition-

ally, the air pressure may detach

the soft tissue connection with

the coronal of the implant lead-

ing to emphysema.

Titanium or titanium alloy

surfaces of dental implants can

be polished using a rubber cup

along with a nonabrasive polish-

ing paste or a ganzer strip with tin

oxide. Not only is the hygiene ar-

maintenence important, but so

are the home care techniques

used to maintain endosseous
dental implants. Patients should

be taught the modified bass tech-

nique of brushing using a

medium-sized head, soft-bris-

tled toothbrush. The use of in-

tratodial brushes should be used

by implant patients after being

shown their proper use. The

plastic-coated wire brush is the

only type to be used with dental

implants to clean and not scratch

the implant surface (Fig. 10).

Recently, automated mechan-

ical toothbrushes have been ad-

vocated as a daily mode of tooth

cleansing. These devices may be

a rotary, circular, or sonic type.

With these home care instru-

ments, the key to their effective-

ness is proper instruction on their

use and then diligent daily use

by the implant patient.

As with natural dentition, ad-

juutive cleaning aids such as

flossing are still valuable. As with
dentated patients, an implant pa-

tient’s home care requirements

should be individually tailored

according to each patient’s

needs. Individual needs are

based on the location and angula-

tion of the dental implants, the po-

sition and length of transmucosal

abutments, the type of prosthesis,

and the dexterity of each patient.

The other popularized type of

cleaning device is the use of oral

irrigators with or without the ad-
dition of antimicrobial solutions.

Also, oral rinses with antimicro-

bial properties such as Listerine

or chlorhexidine have been

widely advocated throughout the

literature9,10.

Summary

During the infancy years of dental

implantology, the emphasi-

s for long term success of os-

seointegrated implants was the

survival phase of dental implant-

ology. In the years that followed,

the emphasis for success had

switched from a purely surgical

influence to focusing more on the

proper fixture placement which

would be dictated by the pros-

thetic and aesthetic needs of each

particular case.

In more recent years, the dental

professional has recog-

nized professional implant

maintenance and diligent pa-

tient home care as two critical

factors for the long-term suc-

cess of dental implants. The mi-

crobiota and clinical presenta-

tion of peri-implanitis is the

same as periodontitis around a

natural tooth.

A complete list of references is
}

available from the publisher.

About the authors

Dr. Gregori Kurtzman, DDS, is in

private general practice in Silver

Springs, Maryland, USA. He can be

reached at Dr.Kurtzman@mary-

land-implants.com.

Dr. Lee Silverstein, DDS, MS, is in

private periodontal practice in Ma-

rietta, Georgia, USA. He can be

reached at akerner@bellsouth.net

MEDIA CME Self-Instruction Program

Dental Tribune Middle East & Africa in collaboration with CAPP introduce to the market the new project mCME. - Self Instruction Pro-

gram. mCME gives you the opportunity to have a quick and easy way to meet your continuing education needs.

mCME offers you the flexibility to work at your own pace through the material from any location at any time. The content is interna-
tional, drawn from the upper echelon of dental medicine, but also presents a regional outlook in terms of perspective and subject mat-

ter.

How can professionals enroll? They can either sign up for one-

year (10 exercises) by subscription for the magazine for one year ($65) or pay ($20) per article. After the payment, participants will receive their membership number and will be able to attend to the program.

How to earn mCME credits? Once the reader attends the distance-

learning program, he/she can earn credits in three easy steps:

1. Read the article.

2. Take the exercises

3. Fill in the Questionnaire and Submit the answers by Fax (071 4 5600885) or Email: info@cappmea.com

After submission of the answers, (name and membership number must be included for processing) they will receive the Certificate with unique ID Number within 48 to 72hours.

Articles and Questionnaires will be available in the website after the publication.

www.cappmea.com

EARN 20 mCME credit hours

Accredited by Health Authority - Abu Dhabi

www.cappmea.com

E-Mail: info@cappmea.com - info@cappmea.com

Fig. 6: Plastic scaler used for recall maintenance.

Fig. 7: Alteration of implant surface after use of stainless steel scalers.

Fig. 2: Gingival fibers between 2 im-

plants showing orientation parallel with the long axis of the implants.

Fig. 3: Plastic curettes for scaling den-
atal implants and demonstration of the implant surface after use. Note that there is no alteration in the surface.

Fig. 4: Gingival fibers between two im-

plants showing orientation parallel with the long axis of the implants.

Fig. 5: Plastic scaler used for recall

maintenance.

Fig. 6: Plastic curettes for scaling den-

tal implants and demonstration of the

implant surface after use. Note that there is no alteration in the surface.