

## GENERAL CONSIDERATIONS FOR SECOND-STAGE SURGERY

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University of Medicine, Tirana, Albania**Summary:**

Many opinions are stressed in the literature as essential and often –overlooked aspects of dental implant surgery, which, when ignored by the clinician, can mean the difference between successful and failed implants. These opinions run the pre-operative, peri-operative and post-operative gamut. Certainly an essential element of the peri-operative category must include exposure techniques at second –stage surgery. The aim of this paper is to illuminate exposure techniques at second –stage surgery as a crucial middle moment in dental – implantology and how this procedure can determine the quality of fitness between implant and its restorative components towards biological, functional and esthetic needs of the individual patient.

**Entry**

It is clear to all dentists dealing with implanto – prosthesis that the challenge of this process is not only the implant's application, but obviously what else matters is the achievement of a perfect aesthetic and functional prosthesis. This "ideal" prosthesis depends on the technician professionalism, but also depends on the relationship between this framework and the soft tissues. Dental implant surgery can be performed as:

1. One - surgical stage. In one –stage surgery the implant is immediately exposed to the oral cavity by means of a gingival healing

device or abutment at the time of the implant placement (photo 1a , 1b , 1c , 1d )

2. Two - surgical stages. In the two-stage modality the implant is left dormant underneath the mucosa for the period of its osseointegration until second surgery is performed to uncover and expose the implant after the healing period (1.2) .

In one-surgical stage, the depth of gingiva over the implant can be evaluated after the osseointegration period, when the healing abutment is removed and the free gingival layer over the implant can be visualized.

During the second stage-surgery (in two- surgical stages method), we face the challenge of implant exposure after osseointegration. At this point, it is expected that the level of gingival's depth over the implant can be different depending on the region where the implant is applied. In the most distal areas of jaws, respectively, at the level of the second molar to mandible and at the tuber maxilla level to the upper jaw, the amount of gingiva is abundant. In both jaws, the amount of gingiva in frontal region represents an optimal thickness also. There is a thin layer of gingiva at the premolar's region. This fact is related to the thickness of the bone in this region as well. Gingival's thickness over the implant



Photo 1a.

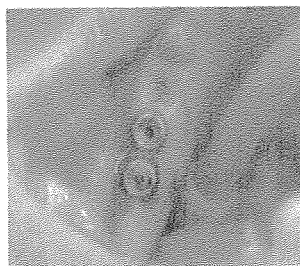


Photo 1b .

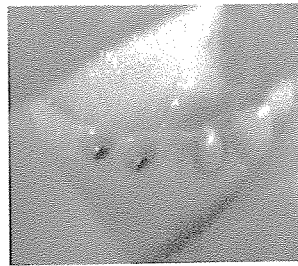


Photo 1c .



Photo 1d

depends also on the predictive ability of the doctor during the implant's application.

The purpose of the paper is to present some important aspects during the second-stage of implantation and how we can better manage different clinical cases.

#### Material and methods:

Different techniques are applied in different clinical cases to expose the implant at second-stage surgery. The peri-implant tissue health, its preservation, its reconstruction and its long-term "relationship" with implant components was carefully observed.

Application of an implant is a challenge, which will result successfully if appropriate indications are followed, working under sterile conditions with great professionalism. Since this time, the dentist must be careful to achieve primary stability of the implant, osseointegration in time and also to predict the further stages of work. The amount of attached gingiva, the thickness of overlying mucosa and the presence or absence of interdental papillae is some of the tissues to be considered before uncovering the implant. If the gingival tissue over the implant is about 4 mm in depth (after the flap is opened), we may apply an implant with tie, the upper part of which can stand up to 2mm above the alveolar crest. If the gingival tissue over the implant is less than 2mm in depth, the implant should be positioned 1 - 1.5mm below the alveolar crest. In this way, the implant does not affect negatively the amount of gingival tissues upon itself. The quality of suturation is of a special importance in this stage too. This will ensure a perfect gingival line within two weeks after the implant's application. Patient's care about themselves should not be neglected in any way after the implant is applied and during the osseointegration's phase. Here are some important points: maintaining a good oral hygiene, smoking should be eliminated, partial dentures on implants

during this time should be possibly avoid (only in specific cases), during mastication the intervention's area should not be stressed, etc. After several weeks, the patient returns again to continue further procedures. The initial surgery and healing process ideally results in a rigidly fixated implant, absence of crestal bone loss around the, adequate zones of nonmobile keratinized tissue ( $>2\text{mm}$ ), soft tissue thickness or discomfort under vertical or lateral forces. A second-stage implant surgery permits the direct evaluation of these criteria and the corrections necessary to land the groundwork for long-term success. During the second surgical phase we have to valuate again the amount of gingival tissue that covers the implant. This measurement can be done by means of a probe (photo 2.) and / or through the panoramic X-ray. The gingival tissue's thickness upon the implant can be:

- Thickness greater than 4mm
- Thickness 2-4 mm
- Thickness of less than 2mm
- The head of the implant is exposed
- Partial exposure of the implant.

According to literature, the optimal level of the gingival tissue thickness upon the implant is 2 - 4mm (3,4,5). At this level, the thickness of gingival tissues enables 1mm of space between the upper board of the implant and inferior part of abutment, and there is still enough gingival tissue to cover the implant. There are two techniques to expose the implant during the second-surgery stage: the excisional technique (photo 3) and incisional technique (photo 4) (6). The former technique is considered "destructive" and the later "reconstructive", because excisional techniques reduce the width of the fixed mucosa and incisional techniques preserve the soft tissue at the site of implant.

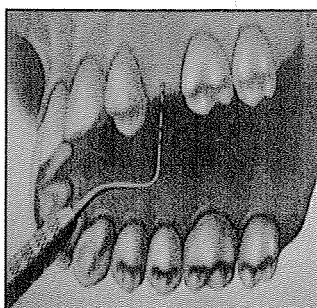


Photo 2.  
Inspection with a probe



Photo 3.  
The excisional technique

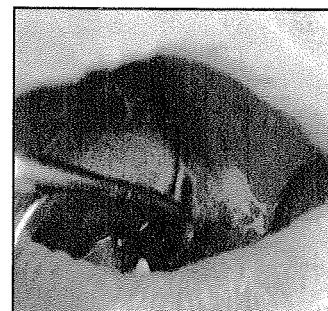


Photo 4.  
The incisional technique

If the gingival tissues thickness is 2-3 mm , the conditions are “ ideal “ and can expose the implant by the excisional technique ( photo 5a , 5b , 5c ) . The exposure is done by mucotom and high –speed motors should be avoided, because the implants can be harmed with these difficult-to-controlled methods.

How can we manage the other cases to approach or to be closed to the “ideal”conditions? If the thickness of the gingival tissue is greater than 4 mm, the excision technique should be used to expose

the implant. A mukotom with a greater diameter than the diameter of the implant is advised. This can facilitate the clinical view at further stages. To respect prosthetic relationship with attached gingiva (must not be greater than 2mm or it would cause mucous infections), we have two choises:

- just at the beginning we should apply implants with tie
- during this phase we can use abutments with 2 - 4.5mm gingival board ,depending on the clinical case ( photo 6a , 6b ) .

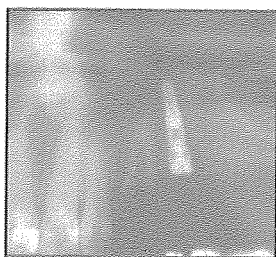


Photo 5a .



Photo 5b .



Photo 5c .

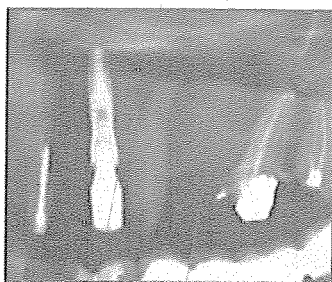


Photo 6a .

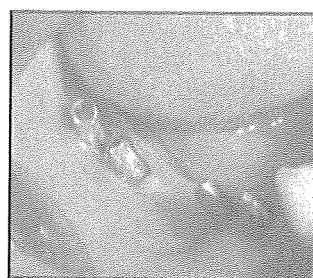


Photo 6b .

If the gingival tissue thickness is less than 2mm (the attached gingival is insufficient), the optimal method to expose the implant is with the incisional technique because it conserves the gingival tissues around the implant. We recommend to perform the

incision more in the lingual /palatinal direction so that when the gingival “miniflap” is opened, a larger quantity of gum remains on the vestibular side (photo 7a , 7b , 7c , 7d , 7e ) .

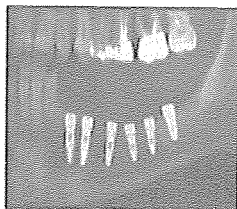


Photo 7a .

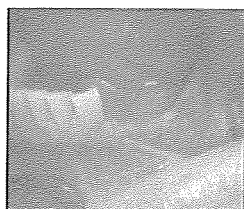


Photo 7b .



Photo 7c .

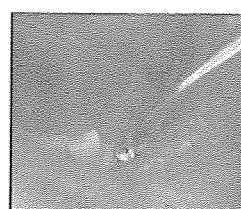


Photo 7d .

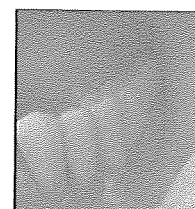


Photo 7e

What can be done if the implant's head is exposed? If this happens, particularly at implants in the anterior region (the aesthetic aspect is very important), we should reopen a flap and pull the

gingiva to recover the implant. After 2-3 weeks we can go on other procedures (photo 8a, 8b, 8c). Sometimes, a gingival graft or a collagen membrane coverage can be applied (7,8,9 ) . In cases when

the implant is partially exposed, we proceed in the same manner. Studies have concluded that as a result of the relationship between degree of exposure and amount of peri-implant bone loss, implants that are exposed prematurely should be exposed as soon as possible after such perforation. In some cases depending on the size of the exposure, if any attached gingiva or a change in contours is desired, there is no other option but to consider a soft tissue graft at a later stage (10)

### Results and conclusions:

The health of peri-implant tissue, as well as its preservation and reconstruction, is critical to the long-term relationship that the tissue has with implant components. The clinician must rise the challenge of optimizing the condition of peri-implant tissues; therefore, a thorough knowledge of implant exposure techniques at second stage surgery is necessary for the clinician to match excisional or incisional techniques with characteristics of tissue overlying the implant, based on the amount of attached gingival, the thickness of the overlying mucosa and the presence or absence of interdental papillae (10).

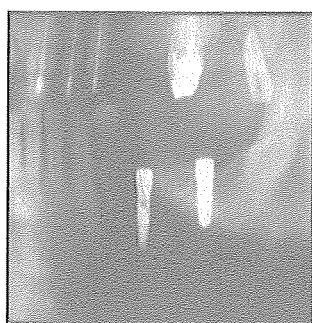


Photo 8a .

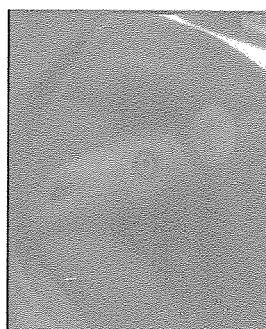


Photo 8b .



Photo 8c .

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