Immediate implant placement long term success: a case report

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Summary Immediate implant placement is sometimes a risky procedure particularly when we are replacing front teeth, patients are always expecting quick aesthetic results. This case report will try to show you how this procedure can be provided with a reduced risk for the patient.

Key words Immediate implant placement, patient selection, aesthetic results, long term success, case report.

Introduction In case of immediate implant placement, the selection of the patient and the site are of primarily importance. This selection will have to integrate anatomical and pathological factors. The following factors will have to be taken in consideration as it has been recommended by the FIT consensus (EVANS & CHEN / 2000):
- medical status
- smoking habits
- patient's aesthetic expectations
- lip line
- periodontal type
- young teeth crown
- infection at implant site
- bone level at adjacent sites
- restorative status of neighbouring teeth
- width of edentulous space
- soft tissue anatomy
- bone anatomy of alveolar crest

One of the most important considerations will be the difficult detection of the patient periodontal biotype!

Fig. 1. Thin periodontal biotype

Soft tissue biotype was previously called gingival biotype or gum type (OLSSON & LINDHE / 1991), but since the advent of implants, this has been renamed to encompass tissue around both teeth and implants (KAN & al / 2005). The term refers to a composite or aggregate of four features of the soft tissues and the teeth they surround that build up to a specific picture:
- gingival width (keratinized tissue width)
- gingival thickness (thick or thin)
- papilla height and proportion
- crown width and height ratio.

Thin scalloped periodontal biotypes (Fig. 1 & 2) are characterized by:
- highly scalloped soft tissues and bone contours
- delicate and friable soft tissues
- narrow band of keratinized tissue
- thin bone with dehiscences and fenestrations
- long pointed teeth whereas thick flat periodontal biotypes (Fig. 3 & 4) are present:
- relatively flat soft tissues and bone contours
- dense and fibrotic soft tissues
- wide band of keratinized tissue
- bone thick with ledges
- short blunted papilla
- short square teeth

This detection is important more particularly to prevent aesthetic complications. Inflammation generated by accumulation of plaque on the root surface extends into the tissue at the distance of 2 mm in all directions (KAN & al / 2010):
- concerning thin biotypes, the distance from the root surface to the oral epithelial surface can be less than 2mm, inflammation will involve all the structures (cementum, periodontal ligament, bone and gingiva) rapidly resulting in a recession. Bundle bone (lamina dura) is very likely to be the buccal plate we can expect considerable collapse of the socket, resulting in a contour deficiency; bone grafting and compromised position / angulation of the implant, especially if patient is getting implant treatment in the aesthetic zone.

Concerning thick biotypes, due to the thick alveolar housing around the teeth, the 2mm radius of inflammation will damage cementum, ligament and bundle bone only producing a periodontal pocket. Patients may end up with less alveolar deficiency; restorative treatment can be viewed as being more predictable and less demanding. Peri-implant tissue health seems to depend to being immobile keratinized tissue around the emerging restoration:
- thin peri-implant soft tissues seems to be more prone to recession and less likely to develop nicely formed papillae around implant restorations.
- tissue recessions around implants seems to result in absence of immobile keratinized tissue more quickly that around natural teeth, possibly because the shoulder of most implants are placed more apical to the cemento-enamel junction of the teeth they replace.

Bone defects around an implant is associated with increased risk of development of peri-implant diseases and authors recommend an augmentation of the keratinized tissue as one of the treatment strategies in managing peri-implantitis.

A thick soft tissue biotype is a desirable characteristic that will positively affect the aesthetic outcome of an implant supported restoration because thick soft tissue is more resistant to mechanical and surgical insults, is less susceptible to mucosal recession and has more tissue for prosthetic manipulation (COOK & al / 2011). Therefore, although tissue biotype is an inherent trait that varies from patient to patient, it can be transformed through precise management of the implant position, implant design and prosthetic design such that a desired aesthetic outcome is achieved (FU & al / 2010). Most of the literature on implant success rates has not differentiated correlation with the gingival biotype, although it is increasingly accepted that the biotype and tissue volume have an important impact on the aesthetic outcome and minimizing the risk for post-restoration tissue instability.

Fig. 2. Triangular teeth, long pointy papilla and this periodontal biotype.

Case report Patient is a man, 45 years old; he is presenting good health, he is non-smoker and his oral hygiene is good. He complained five years ago (in 2010) about the presence of a recent diastema between 11 and 21, and about a slight mobility tooth 21 (Fig. 5) After complete examination, we detected the presence of a root resorption (Fig. 6), so it has been decided to extract this central incisor and to replace it by a dental implant. A complete aesthetic risk assessment of the patient and the site has been done and the results are presented in red inside of Table 1.

An extraction without incisions has been done using periotome in order to preserve the surrounding bone and soft tissues. A Straumann® bone level implant (length 12mm / diameter 4.1mm) has been placed inside the socket in a palatal position and the remaining gap (around 1.5mm) between the implant and the buccal bony wall has been filled with a bone graft Bio-Oss®, and the top of the socket has been protected with a Colla® grid. The bone graft has been used with a Colla® without sucretes (Fig. 7 & 8) (CORDARIO / 2014).

Then at the end of the same appointment, the extracted tooth (full crown and 5 mm of the root) has been used as temporary restoration and fixed to the adjacent teeth using a metal grid. The presence of this previous tooth was of primarily importance in order to support the surrounding soft tissues and more particularly the papilla on both sides of the implant (Fig. 9 & 10).

Before to restore the implant with a final crown we took in consideration the latest recommendations concerning cementation on dental implants (I.T.L. / 5th Consensus 2013):
- after bone level implants placement, if the depth of the mucosa margin is deeper than 1.5mm, screw-retained prosthodontics are highly recommended;
- reduce the quantity of cement used to cement prosthetic restoration;
- if the patient has been treated previously for periodontal diseases, use only temporary cement, you will have the possibility to remove the superstructure in order to treat an eventual peri-implantitis.

At the time of the final restoration, it is also very important to keep in mind predisposing factors leading to cement retention around dental implants:
- the soft tissue connection around dental implants (epithelial adhesion with hemidesmosomes and absence of connective tissue attachment) which is different from natural teeth (epithelial attachment and connective tissue attachment); using a sub-gingival placement of the implant more or less deep than the cemento enamel junction of the natural teeth;
- the abutment selection: abutment with a fixed restorative margin 2.5 mm to the implant neck or one-piece implant with a built-in restorative margin;
- the radiographs are unable to show the presence of retained cement on buccal and palatal / lingual sides;
- the cementation issues excessive quantity and unsuitable type of cement used;
- the maintenance controls not always respected by a majority of patients.

At the end of a period of healing of 10 weeks, we can see the very good positioning of the soft tissues (Fig. 11), the implant has been exposed (Fig. 12), the depth of the sulcus was more...
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By Dental Tribune MEA/CAPP

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*Fig. 9. Extracted tooth placed as temporary restoration

*Fig. 10. Extracted tooth fixed using metal grid

*Fig. 11. Temporary restoration after 10 months

*Fig. 12. Implant exposure after 10 months

*Fig. 13. Low smile with permanent crown

*Fig. 14. Permanent restoration after 5 years

*Fig. 15. Permanent restoration screwed retained after 5 years

*Fig. 16. Radiographic control after 5 years

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