Peri-implant soft tissue recessions

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Introduction
A beautiful aesthetic result is difficult to obtain with implants in the anterior areas. Both the alignment of the gingival margin and the presence of papillae are essential elements in resolving aesthetic implant problems to achieve an harmonious smile. These two soft tissue entities, however, are closely related to the patient’s biotype and to the quality/quantity of underlying structural alveolar bone.

The peri-implant gingiva, particularly if it is narrow, with a thin-scalloped biotype, is inevitably retracted six months after the abutment connection and restoration, owing to the reformation of the biologic space (Small and Turnow, 2000).

The process of soft and hard tissue healing must be understood and incorporated into a carefully coordinated sequence of therapy. It is also important to identify complications and clinical mistakes and their implications on the final aesthetic outcome (Saadoun et al., 1999).

How, then, should soft tissue recession (bone and gingiva) around an implant be prevented or treated?

Prevention of peri-implant recession
Marginal bone loss of 1 mm in the first year following the abutment connection, followed by loss of 0.2 mm per year, were among the criteria defined for implant success (Albrektsson et al., 1986). Saving a few tenths of a millimetre of bone around an implant does not increase the longevity of the implant, and should be done only for aesthetic reasons. To prevent or to decrease peri-implant bone resorption and consequent gingival recession following implant restorations in the anterior zone, several strategies have been suggested, which are explained in detail in the following points.

1) Implant design and diameter
The design of the collar of the implant should stabilize the crestal bone by bringing the roughened surface right up to the platform, and the threads/microgrooves as close as possible to the platform, with no divergence of the collar walls.

The thread position of the implant determines the effective level of remodeling after loading, and this is perhaps even more important than the presence of the implant abutment microgap. (Rompen et al., 2005).

Placement of the implant platform 1.5–2.5 mm above the bone, helps to minimize bone loss as the biological space around the implants is established on the collar (Lezly Miller, 2003).

2) Implant placement and extraction timing
To make the best choice between different alternatives of implant placement, a precise pre-surgical diagnosis is necessary in order to evaluate the gingivo-osseous parameters, to determine the optimal moment to extract the tooth and place the implant, and to decide whether implant placement and loading should be immediate, early or delayed (Saadoun and Landsberg, 1997).

Orthodontic treatment is the best solution for patients who wish to limit the surgery required for the placement of implants to a single session, and to enhance the hard and soft tissue profile prior to extraction and implant placement (Salama et al., 1993).

5) Flap design
On healed site the limited flap design minimizes interproximal bone and papilla loss. Many flap design have been described for healed sites, some raising the total interproximal papilla with surgical incision around adjacent teeth, others using midcrest/palatal crest incision with sulcular envelope flap and, finally, tissue punch flap recommended in large amount of keratinized gingiva.

Flapless approach using tissue punch technique has many advantages: less trauma to the bone and disturbances to the soft tissue stability, reduction of pain and oedema, and less post surgical information.

Immediate implant placement after extraction is usually a flapless surgical procedure, the extraction being done using a periosteum to minimize traumatic damage to the hard and soft tissues.

4) Tridimensional implant placement
Satisfactory morphology of the papilla and of the gingival margin after anterior implant restoration depends ultimately on two factors: implant placement (Esposito et al., 1993, (Saadoun et al., 1998, Joannou, 2003) and implant restoration.

The tridimensional criteria for implant placement in the aesthetic zone are:

- Mesio-Distal: 1.5-2.5mm between implant and adjacent tooth 3.5-4mm between implant and adjacent implant.
- Bucco-Lingual: 2.5-3.5mm from the cervical height of contour of the adjacent teeth to the buccal surface of the implant platform.
- Coronol-Apical: 2.5-3.5mm apical to the buccal gingival margin depending on the biotype

Therefore, if immediately post extraction implant placement is indicated, the osteotomy must be performed against the palatal wall to prevent any damage to the remaining (and usually thin) buccal cortical bone (Testori, 2003).

5) Connective osseous grafts
An autogenous bone and xenograft with a membrane is used to gain buccal thickness knowing that bone resorption/gingival recession always occurs after extraction/implant placement.

Gingival biotype plays an important role in determining tissue levels achieved around implants. A thin biotype is generally more susceptible to peri-implant recession, induced by the resorption of a thin labial cortical plate. The use of osseous and connective grafts converts a thin gingival biotype into a thick gingiva (Mathews, 2000), which can enhance gingival marginal stability and simplify tissue management during the restorative treatment phase.

6) Abutment and restoration
Optimal aesthetics will be promoted if the final abutment is installed at the time of implant placement, and left in place undisturbed, throughout the final restoration phase, avoiding disturbance of bone and soft tissue architecture.