

## **Two Stage vs. One Stage – Is There Really A Controversy?**

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### **Introduction**

The long held injunction setting the two-stage implant approach as the standard surgical modality is derived from the original Branemark protocol developed in the 1960's and 1970's. This protocol was designed as a solution for the totally edentulous patient to support a removable or hybrid type replacement prosthesis. The initial working premise for the two stage approach was that the successful development of osseointegration at the bone implant site during the healing phase.

Animal and clinical research conducted over the last ten years, however, have convincingly proven that a one stage protocol can deliver an equal level of predictability to the achievement of osseointegration. Indeed, the present state of knowledge has rendered as moot, any discussions comparing the two or one stage approaches solely based on their ability to achieve osseointegration. Instead, relevant comparisons of the two approaches now focus on their ability to promote clearly defined clinical endpoints such as patient management, esthetics and peri-implant tissue health. Towards that end, therapeutic decision making must emphasize the matching of surgical protocols with the appropriate implant design based on the specific parameters inherent at the receptor site (Table 1).

We have identified specific clinical parameters that directly affect the choices made. These parameters are categorized as follows:

I. Implant placement is the mature site.

#### Esthetic anterior vs. posterior implant placement

A) In posterior or edentulous implant placement a one stage surgical protocol and a one stage implant design, i.e. with a polished collar of 1.5-3mm offers distinct advantages. These advantages include easier and more efficient patient management because there is only one surgical intervention. In addition, optimal management of the peri-implant biological width is enhanced by moving the implant/restorative microgap above the osseous crest.

B) In anterior esthetic applications, however, the soft tissue demands create significant challenges that alter decision making. Even proponents of one stage implant systems have proposed altering their surgical protocols in the anterior region to include a two stage protocol of deeper than usual fixture placement which negates the advantages listed earlier for the placement in the posterior region.

It is, therefore, clear that soft tissue and esthetic demands will effect the choice of a one or two stage implant protocol as well as a one or two stage implant design.

## II. Immediate extraction protocol – two or one stage

Esthetic concerns determine that a tooth destined for extraction should be evaluated prior to tooth removal to comprehensively evaluate the potential implant receptor site. If it is within the esthetic zone, the necessity of the underlying osseous topography being present to support the soft tissue profiles of the restorative recipient site is essential. Esthetic soft tissue predictability necessitates the presence of interdental osseous peaks of bone within 5mm of the contact point of the potential final restoration. If deficient, soft tissue profiles and the underlying osseous housing may be augmented prior to extraction utilizing orthodontic manipulation of the tooth in an incisal direction. Following an atraumatic extraction, (without raising a flap/incisionless) the residual socket is now evaluated to ascertain if it is intact or if there is compromise in the labial or lingual osseous plate – which may take the form of either a dehiscence or a fenestration.

The advent of wide platform fixtures dramatically altered the immediate implant technique. The matching diameter of the implant body and that of the socket eliminated the need for a membrane over the top of the socket to allow for G.B.R. in the gap between the fixture and the socket in the coronal portion. If these wide bodied fixtures were directed somewhat lingual to the original socket, they could often be placed in the native bone with primary stability while obliterating the access to the socket thereby not requiring a membrane and G.B.R. (This eliminated the need for a definitive two stage procedure and a healing abutment could then be used in the conventional one stage approach.) If the site is intact, the sequential drilling osteotomies are preformed and the site once again evaluated for perforation of the bony housing. If none exists, the implant may be placed in a one stage nonsubmerged approach. (Fig. A and B – 135, 139)

Perforation of the socket during the sequential drilling osteotomies for cylindrical traditional implants can often be eliminated by using a fixture design that decreases in diameter towards the apical region to accommodate the labial concavity in the premaxilla – no osseous compromise facilitates a one stage approach and expedites the process.

However, if either following extraction or the drilling osteotomies the integrity of osseous housing has been compromised a flap may now need to be raised. In our opinion, if the osseous compromise is a dehiscence the two stage approach becomes necessary. In these cases, the bone is invariably lost on the labial surface and following implant placement, primary stability is evident but threads may be exposed thru the osseous housing. In these cases membrane guided bone regeneration may be utilized in conjunction with some form of grafting material to maintain space below the membrane. A two stage implant design is generally easier to use in these cases as the reduced profile facilitates complete flap closure.

The tissue must now be advanced coronally