Ten tips that everyone should know before performing a treatment involving implants in the aesthetic zone.


Introduction

Nowadays, implantology is a predictable area and well-accepted by scientific community for missing or doubtful prognosis tooth reposition. More than 30 years ago, Brånemark and col. published the first articles that presented implantology as a safe and predictable method to rehabilitate edentulous patients if a rigid protocol is performed, in which one of the key factors were the time the implant was submerged until loading (3 months for the jaw and 6 months to the maxilla)(Brånemark 1977).

Years later, Albrektsson establishes a success criteria for every treatment involving implants, where implants should be absent of mobility, pain, radioluscence around the implant, and the bone loss should never be more than 1,5 mm and 0,2 mm per year (Albrektsson 1986). Although this is a prevailing criteria, at that time treatment involving implants were mainly functional and aesthetics were at most at the time not a mandatory requirement. Smith et al. just three years later established that aesthetic have also an important role on a successful implant treatment (Smith 1989).

For that there are some golden rules that every implantologist should manage in order to achieve predictable results on the aesthetic zone and in this article there will be described ten rules that everyone should consider:

1) Edentulous gap in the anterior zone: When there will be papilla?

Presence of papilla between an implant and a teeth depends mainly on the presence of inter proximal bone of the adjacent teeth. If there is a bone defect there will not be papilla (Kan 2003). There is also a relation between the presence of the papilla and the distance between the contact point and the bone crest (Tarnow 1992), where there will be a probability of complete presence if this distance is 5mm or less (98%), and less probability if that distance is 6 mm (56%) and 7 mm (27%).

Fig. 1-3.Different distance from the contact point to the bone crest will represent different soft tissue contour. The more distance the less probability there will be papilla at the inter proximal contact.
2) Placing 2 adjacent implants. What should we expect?

Placing two implants adjacent is always a big challenge. The mean papillary height between to implants will be 3.4 mm, which is in most cases insufficient to achieve an optimal aesthetic result (Tarnow 2003). This issue can be solved by placing one implant to substitute two anterior teeth. This way it is expected to achieve a higher papilla level between an implant and a pontic (5.5 mm) (Salama 1998).

![Image](image1.png)

**Fig. 4-5.** Aesthetic results when two adjacent implants are placed adjacent is always a challenging issue. The average of papilla height we should expect is 3.4 mm.

3) Selecting the correct abutment.

It is important to choose the right abutment when an aesthetic restoration is performed. If there is a thin mucosa with less than 2 mm width, zirconia should be the option cause metallic abutments will show a color alteration of the peri-implant soft tissue (Jung 2007, 2008).

![Image](image2.png)

**Fig. 6-8.** When the width of the buccal soft tissue is more than 2 mm, a metallic abutment can be used without altering the soft tissue color.
4) Immediate implants and aesthetic results. What we should know?

Although this is a very discussed topic, there are some basic knowledge about immediate implants in the aesthetic zone. Unavoidable bone resorption happens when a tooth is extracted (Cardaropoli 2003, Schropp 2003, Araujo & Lindhe 2005) and this events are not avoidable if the implant is placed at the time of the extraction (Botticelli 2004, Araujo & Lindhe 2006). There are some protocols published to overcorrect this events, like performing a connective tissue graft at the time of the immediate implant (Kan 2000, Kan 2005), but recession of the gingival margin is likely to occur (Evans 2007). This facial recession will be more pronounced on a thin biotype rather than a thick biotype (Kan 2011), so there could be stated that immediate implants in a thin biotype is not a predictable treatment and other treatment options should be consider, like ridge preservation (Jung 2012).

5) Early implant placement. A predictable alternative.

The time when the implant is placed has been a topic of discussion (Hämmerle 2004). One option is perform the extraction and after one month place the implant with simultaneous ridge augmentation (Buser 2013). This method as been proved to be a reliable way to achieve predictable aesthetic results.

6) Provisional restoration. Is it mandatory?

After extraction of the teeth, it is important to preserve the papilla architecture. Some authors stated that placing an implant at the same time the teeth is extracted somehow helps to preserve the shape and the papillary architecture.
Even if there is no provisional after the surgery, it is important to reshape the soft tissue before placing the definitive prosthesis. The provisional restoration is also a way to achieve the final peri-implant shape and then transfer this emergence profile to the lab (Elian 2007).

During the provisional phase of the treatment, a correct and natural emergence profile should be created in accordance with the adjacent teeth. In every emergence profile it can be identify two contours (Su 2010):

- Critical contour: The contour 1 mm immediately below the gingival margin. This contour when modified can displace apically the gingival margin.
- Subcritical contour: Is the contour below the critical contour. When properly managed, this contour can create soft tissue volume (concave) and once this volume is created it can be displaced where is needed.

There are some other ways to manage the provisionals during the healing phase but always regarding the concepts posted before (Wittneben 2013).

Fig. 12-14. Every demanding esthetic treatment involving implants should have a provisional phase before the definitive prosthesis is delivered. It is mandatory to design natural emergence profiles before finishing the treatment.

Fig. 15. Critical contour and sub critical contour is a recent concept that explain the behavior of the peri-implant soft tissue when it is modified.
8) Implant three dimensional position. Where to place the implant.

When an implant is placed in the anterior aesthetic zone, there are some rules that should be a guide for every implant placement (Buser 2004):

- Mesio-distally: The implant should be at a distance of 1,5 mm from the adjunct teeth. This is the minimal distance although there are some articles that even showed that 2 mm would be an improvement (Gastaldo 2004).
- Apico-coronally: This distance should be 3-4 mm distance from the gingival margin of the future restoration. In immediate implants the reference is the gingival distance of the removed teeth. If there is no teeth previously, a wax-up should create a reference of the future restoration.
- Buccal-palatal: The buccal part of the implant should be 1-2 mm palatal to the emergence profile of the adjacent teeth.

9) Choosing the right implant.

Nowadays there is an increasing implant market in almost all countries with some new implants brands. This is something positive to the clinician but we have to be well aware if the different implants companies can fulfill our expectations and also the treatment and patient goals.

Platform switching is a biological concept well implemented in almost all the implant brands (Lazzara 2006), but we should know that although it is an important issue, platform switching is not the only factor that can contribute to less bone remodeling after implant placement. Lately, Zipprich (Zipprich 2007) proved that the stability between the implant and the abutment is crucial to avoid the “pumping effect” which leads to bone resorption.

Fig. 16-18. Placing the implant in the comfort zone is a requisite when implants are placed in the aesthetic zone.

Fig. 19. Knowing the behavior of the implants that are used in the daily practice will allow the clinician to have an extra confidence with the treatment options offered to the patient.
10) New techniques to avoid buccal bone resorption.

Several methods have been described to avoid the negative effect of an extraction like immediate implants (Botticelli 2004, Araujo & Lindhe 2006), barrier membranes (Lekovic 1997) although the most suitable technique advocated to preserve the volume of the socket is the ridge preservation (Araujo 2009). Lately a new technique is being described as an option to perform an immediate implant without the negative consequences of the bone remodeling after an extraction (Hürzeler 2010), and the rationale behind this technique is preserving a tooth fragment that will avoid the resorption that takes place after the extraction. Although this technique is quiet promising we should be aware of the incoming publications about a larger follow up of this technique and the predictability of leaving a fragment inside the socket after an extraction (Baumer 2013, Kan 2013).

Fig. 20. The socket shield technique is a recent method to avoid buccal bone resorption when immediate implants are performed. We should wait for new literature about this technique with larger follow ups before applying it on our daily practice.
Conclusions

Today we can find in the literature an important number of reliable protocols to achieve a satisfactory aesthetic results in our treatments. But we should consider that the success is most likely to happen if a correct diagnose and treatment plan is carried out. There are some important tools that we should use daily in our daily practice in order to asses and to help clinician to identify the complexity of a case before a treatment plan is defined (Buser 2009).

Clinicians also should perform protocols that are well described at the literature and with a follow up that categorize that treatment option as a predictable in long term. Nowadays there is sufficient data and scientific background to establish clear guidelines when demanding aesthetic treatments involving implants are required.
Bibliography


About the Author:

Francisco Teixeira Barbosa

Francisco Barbosa graduated from the university Alfonso X El Sabio, Madrid, Spain in 2004. After finishing his graduation, he started the post graduation studies where one year later he finished the post graduated studies of Oral Implantology at Santiago de Compostela University, Santiago, Spain. Moved his practice to Barcelona where he continued his education at Escuela Superior de Implantologia in Barcelona and as a Dentist at the Maxillofacial department of Hospital del Mar at Barcelona. At the same time he started his private practice in Barcelona and also finished his degree in Advanced Oral Implantology at Loma Linda University, LA, California, USA. At the moment he lectures all around Spain, Portugal and Italy and participates in many research protocols. He is also the author of the iBooks about oral implantology “Immediate implants immediately restored” and “Immediate loading and immediate restoration with CAD/CAM technology”.

Publications:

Immediate Loading with CAD/CAM prothesis

Immediate Implants Immediately Restored

Social network:

Twitter: cisco_research

Facebook: Francisco Teixeira Barbosa

Instagram: tuminha-dds

LinkedIn: Francisco Teixeira Barbosa

Google+: Francisco Teixeira Barbosa