

Immediate Placement and Provisionalization of the implant post extraction of the upper right first premolar, using the M.I.S. system. Case Report

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Summary

Immediate charging is an essential tool in implantology, as it allows us to offer patients shorter treatments, less traumatic and often with better results, as long as we understand their basics. Immediate charging will be related to a number of factors that relate directly to the final outcome of treatment. In the following article we define concepts such as immediate charging, as well as various factors that set the standard of this treatment, and finally we develop a clinical case in which we perform the placement of a SEVEN M.I.S. implant and immediate provisionalization of the same, post extraction of the upper right first premolar.

Introduction

The study of the concepts of immediate charging or provisionalization, and the development of one-piece implants has opened a new world of dentistry. Integrating these two concepts to the daily practice of oral implantology is a challenge that all professionals involved in this area should take on.

The concept of immediate charging has been debated for many years, as much of its definition as its success rate. But, in the present day, there is no doubt that immediate charging works, since there have been published, around the world, many articles indicating a success rate exceeding 93%. On the other hand we have the one-piece implants, in which the implant and the prosthetic abutment are carved in a single structure of titanium, ready to be restored temporarily or permanently at the time of the implant placement. This type of implant is relatively new and there is little information about it. The union of these two concepts gives us the opportunity to offer patients an innovative treatment with many benefits

for both him and the professional who provides the service.

Implantology is a prosthetic science with a surgical component, therefore the restorative part along with the proper diagnosis and preoperative treatment plan, play the most important part in rehabilitating a patient with implants, since these will define the type restoration to be used (screwed crown, cemented, simple, splinted, etc.). They also define the occlusal charge that the restoration will receive, and value the interocclusal space, mesiodistal and the vestibular-palatal/lingual to achieve optimal results. By using one-piece implants, the prosthetic preoperative planning is essential, as the options to rehabilitate the implant are limited to the components of the pillar, whether it is straight or angled. For this reason the presurgical prosthetic assessment and the case selection are probably the most important step when we place these of implants. Hence the need to understand all the factors that interact in these cases.

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Bibliographic Review

There are many articles that define the concepts of immediate charging, immediate provisionalization, immediate occlusal nonfunctional charging, early occlusal charging, etc. Concepts that are often used incorrectly to describe the treatment performed. Mish et al.¹ in 2004, published an article identifying some of these concepts:

- Immediate Occlusal Charge: occlusal charge before 2 weeks of the implant placement.
- Early occlusal charge: occlusal charge between 2 weeks and 3 months after the implant placement.
- Immediate nonfunctional restoration: implant-supported restoration delivered to the patient before 2 weeks of the implant placement with no direct occlusal charge.
- Early nonfunctional restoration: implant-supported restoration delivered to the patient between 2 weeks and 3 months after the implant placement with no direct occlusal charge.
- Delayed occlusal charge: restoration with occlusal charge delivered to the patient 3 months after the implant placement.

Once we understand these concepts and we learned the differences and similarities of these, we can understand and have a better approach to analyze

studies that have been published on the topic.

Avila et al.² 2007, mentioned in their article some advantages and disadvantages of performing immediate charging, among the advantages they mention the elimination of a second surgery to uncover the implants, which leads to less waiting time for the healing, especially the soft tissue, as well decreasing the patient visits, so these treatments are better accepted. They also mention among the disadvantages the increased micro-movements, which raise the failure rate, and they also cited that often the end result in terms of the relationship between the bone and soft tissues is unpredictable.

When we analyzed immediately charge articles, we find that the authors used different variables and factors to focus the results of their studies, whether it is the success rate, the rate of bone loss, implant type, implant surface, bone type in which the implant is placed, etc.

Gapski et al.³ 2003, mentioned in their article, four categories of factors that play an important role in the success of immediate charging.

- Factors related with the surgery.
- Factors related with the receptor of the implant (bone).
- Factors related with the occlusion.
- Factors related with the implant.

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Among the factors associated with the surgery, initial stability is mentioned as one of the most important concepts in order to make an immediate charge, since the micro movements produced by the absence of this cause bone loss and prevent osseointegration. According to Ottoni et al.⁴ 2005, the implant insertion should be performed with a torque higher than 32 Ncm, if the case that you want to charge immediately. Another of this group of factors is the surgical technique, which include the use of irrigation, sharp bits and that the speed of the osteotomy does not exceed 1500 rpm. Any of these factors which are not taken into account could cause irreversible necrosis in the bone which is being prepared.

Regarding the factors related to the receiver (bone quality and quantity), we can say that these two factors will be directly related to the treatment's success. Mish⁵ in the 90's classified the bone according to their density:

- D1, dense cortical bone, usually in the front jaw.
- D2, porous cortical bone and medullar bone with big particles, usually found in the back jaw.
- D3, thin porous cortical bone and medullar bone with fine particles, found in the front maxilla.
- D4, medullar bone with fine particles, found in the back maxilla.

Postulating that the best type of bone for placing implants is the bone that has D1

density, followed by the D2 and D3. And that the one in which we achieved the highest rates of failure are in the D4 bone.

Jaffin and Berman⁶, 1991, published a study confirming what was described by Mish. Using Branemark implants, they placed them in different types of bone, obtaining a success rate of 97% in bone type D1, D2, D3 and a percentage of 75% in D4 bone.

On factors related to the receptor we can also mention the patient's health status and habits. Many studies show the relationship between the success rates and the systemically compromised patients. Among the most common diseases that can be mentioned are Diabetes, HIV, and osteoporosis. In addition to these diseases, patients with habits like smoking and drinking are also affected.

The third factor is related to the occlusion, one of the most important factors, as the majority of failures reported in implantology is due to occlusal overload problems, either by parafunctional habits of the patient or by a bad check in the occlusal height of the restoration. Balshi et Wolfinger⁷ in 1997 showed in a study that there was a failure rate of 75% in patients with parafunctional habits.

The fourth factor cited by Gapski et al.³ 2003, relates to the design of the implant. Trading houses play a very important role in this point, since these are the one who develop the implants and conduct the investigations regarding them, in order to achieve better designs, surfaces, textures, prosthetic connections, etc., and therefore please

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the needs of the professionals at the time of implant placing and restoring the implants.

M.I.S. implant characteristics

The commercial house of implants M.I.S. offers many options in what implants are concerned, which lets us choose the implant that best suits the needs of the patient. In the present case, the implant used was an M.I.S. SEVEN, which has very favorable characteristics when we are looking for an immediate charge treatment. This implant is made of titanium alloy (Ti 6Al-4V) and is surrounded by a SLA surface, this surface is mixed with a sand blasting, with acid etch which allows giving roughness to the implant and increasing the mechanical strength by 25%. Among other features, we can mention the double thread of 2.4mm, which allows a faster insertion. At the same time, it has a self screwing capability which facilitates the insertion. If we speak of initial stability, the SEVEN implant counts with micro rings (0.2x0.2) in the neck, which allows for a better distribution of forces in the crestal area. The M.I.S. SEVEN implant is available in diameters of 3.75mm, 4.20mm and 5mm; and in lengths of 10mm, 11.5mm, 13mm and 16mm. Another important point to add is that each of the implants has a disposable final bit.



M.I.S. SEVEN implant

Characteristics of the prosthetic components

As for the prosthodontics, M.I.S. has a variety of options that will adjust to the type of treatment that is desired. At the same time, it also has options to help correct the angle or position of the implant from the restorative point of view. In this particular case it is very important to mention that M.I.S. has a temporary abutment made of a polymer, which allows to prepare it without any problem, it can even be prepared in the mouth as it is made of a certain type of plastic and it does not generate heat, which prevents damage to the implant. We must always keep in mind that when preparing provisional abutments on the implants in the mouth, when performing immediate charge or provisionalization, we can cause micro movement or micro bone fractures, which can lead to treatment's failure.

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M.I.S. prosthetic kit

Clinical Case

24 year old female patient, known healthy, with root remains of first upper right premolar. One of the patient's main concerns was the use of removable dentures or having to submit to the erosion of their natural teeth for the fabrication of a bridge. Therefore the patient is offered an extraction and immediate placement of an M.I.S. implant of 4.2mm in diameter x 13mm, and the immediate provisionalization of it using a provisional abutment and a polycarbonate crown.

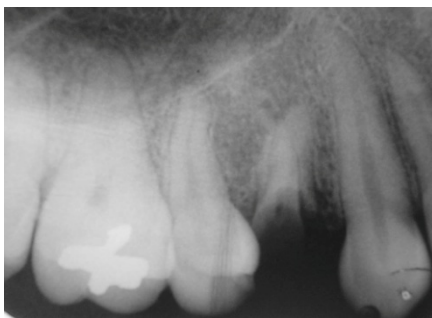


Fig. 1. Root remains of the first upper right molar.

Atraumatic extraction of the residual root is performed using the straight lifter, preserving as much bone as possible. Subsequently we proceed with the

placement of an M.I.S. SEVEN implant of 4.2mm in diameter and 13mm in



length.

Fig. 2. M.I.S. implant in position with



provisional post



Fig. 3. Provisionalized implant with polycarbonate crown, 8 days after surgery, occlusion free.



Fig. 4-5 Patient 5 months after surgery.

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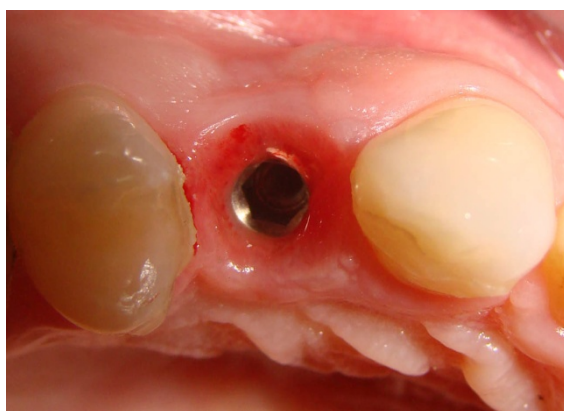


Fig. 6-7 The provisional crown is removed and the surrounding of the gum is observed. It is prepared for the final print take.



Fig. 8-9 The print is taken, it is placed in analogue position and the print post is dripped with plaster.



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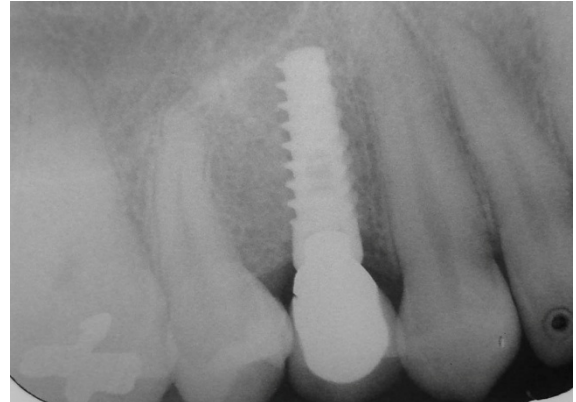


Fig. 9-10-11-12 Final cemented crown on the pillar of the implant.

Discussion

Immediate loading works, but the success of this will depend on how the above factors are handled. There are factors that are handled at the surgical and prosthetic level, factors that can vary; but there are also predisposed factors that cannot be changed, therefore the patient selection plays an important role in the treatment, because, depending on the systemic and bone characteristics, and the presence of parafunctional habits of the patient, the results of a case may not be the ones desired, even though the variable factors have been handled correctly.

In this clinical case we observe an ideal patient in which we are able to conserve the bone during the extraction, allowing the placement of the implant in the desired position. The immediate provisionalization is done with a temporary universal pillar and a polycarbonate crown, with whom we could return the aesthetics and a limited

function. Subsequently, at 4 months of initial surgical procedure, all the components are removed to take the final print and deliver the final prosthesis. Healthy soft tissues are observed with an ideal shape that will allow a very acceptable aesthetic result.

Conclusion

A correct diagnosis and treatment plan is the key to all dental procedures, especially in the field of implantology. Being implantology a prosthodontic science with a surgical component, the pre planning at prosthetic level will be the key in the final outcome of treatment.

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