IMMEDIATE-LOADING POST EXTRACTIVE IMPLANTS: INDICATIONS, ADVANTAGES AND LIMITS

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SUMMARY

Immediate-loading post extractive implants: indications, advantages and limits

The possibility of rehabilitating immediately an edentulous patient offers today remarkable advantages because it satisfies the patient's demands for comfort, aesthetics, and functionality and reduces the surgical stages for the professional.
In the last years clinicians and companies have been concentrating their efforts in the development of new surgical techniques and biomaterials in order to speed up the osteointegration process, which fosters the functionality, that is the immediate-loading.
This clinical report, based on the analysis of the literature and on the presentation of a case report, shows how satisfying results in functionality and aesthetic can be obtained by a careful diagnosis and an accurate therapeutic planning, reducing at the same time the stress for the patient and the surgical stages for the professional.
In any case, it is necessary to have the rehabilitations with immediate-loaded implants directed by workers with a good knowledge and experience in surgery, periodontology, and prosthesis or by a work team able to face all the complications such advanced rehabilitations may cause.

Key words: implants post-extraction, immediate implants.

RIASSUNTO

Gli impianti post-estrattivi a carico immediato: indicazioni, vantaggi e limiti

La possibilità della riabilitazione immediata nel paziente edentulo rappresenta oggi un notevole vantaggio in quanto risponde pienamente alle esigenze di comfort, estetica e funzionalità del paziente stesso e riduce notevolmente i passaggi operativi per il professionista.
Negli ultimi anni la ricerca dei clinici e delle aziende si è focalizzata sullo sviluppo di tecniche chirurgiche e biomateriali capaci di accelerare il processo di osteointegrazione a vantaggio della funzionalità cioé del carico immediato degli impianti.
Il nostro lavoro, basato sull'analisi della letteratura e sulla presentazione di un case report, evidenzia come con un'attenta diagnosi e con una corretta programmazione terapeutica sia possibile ottenere dei risultati favorevoli in termini di funzionalità e di estetica, limitando lo stress per il paziente ed i passaggi operativi per l'odontoiatra.
È necessario, comunque, che la gestione delle riabilitazioni con impianti a carico immediato sia affidata ad operatori con buone conoscenze ed esperienza in chirurgia, parodontologia ed in protesi o comunque ad una equipe odontoiatrica polispecialistica in grado di affrontare le diverse complicanze che riabilitazioni così sofisticate possono presentare.

Parole chiave: impianti post-estrattivi, impianti a carico immediato.

Introduction

Thanks to the recent progresses in the biomaterials and in the surgery technique, the dentist has effective instruments available to realize complex treatment plans. In particular, the original operative osseointegration protocols have been redefined in order to satisfy the patient's increasing expectations both as regards the reduction of the treatment period and the improvement of the aesthetic and post-operation comfort.

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Figure 1
Vestibular fistula near the dental unit 2.1, which had been devitalized and restored by a Richmond crown.

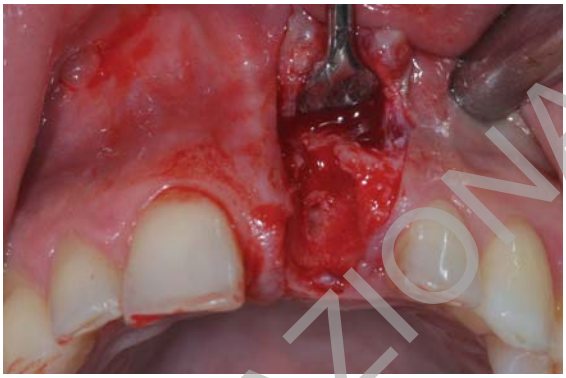

Figure 3
A mini flap is opened in the vestibular area of the dental element 2.1 to see the bone defect and to make it accessible.

Figure 2
Irremediably compromised abutment on the 2.1.

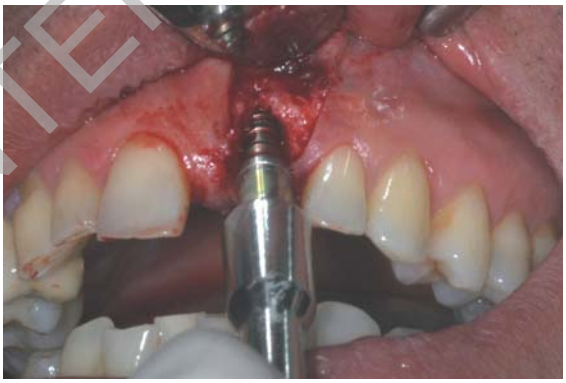

Figure 4
BTLock expander-compactors were used to prepare the implant site without bone loss.

The introduction of the new systems with immediate and delayed loading have permitted to decrease the time of the therapy. The classical pattern "no load on the implant during the healing" has became "no micro movements on the implant during the healing".
In the aesthetic field the preservation of both soft and hard tissues (especially in visible areas) has been underlined. As consequence, to avoid the bone resorption after the dental extraction, the concept of post extractive implantology has developed.
It is common that, especially on the upper jaw, about the 23% of the bone volume disappears during the 6 months after the extraction, and an other 11% of it disappears during the 2 following years (13). The possibility of inserting the implant directly on the extractive alveolus permits to decrease this resorption alveolar and to reduce the period of healing. Moreover, the use of a flapless technical guarantees the minimal resorption of the gingival tissues and a better aesthetic result.
Many studies have showed the validity of the immediate-loading in the post extractive implants and have guarantee the security of the operative process as long as the stiff fixed protocols are respected (1-3).
The good primary stability after the insertion of the implant and the respect of the concept of

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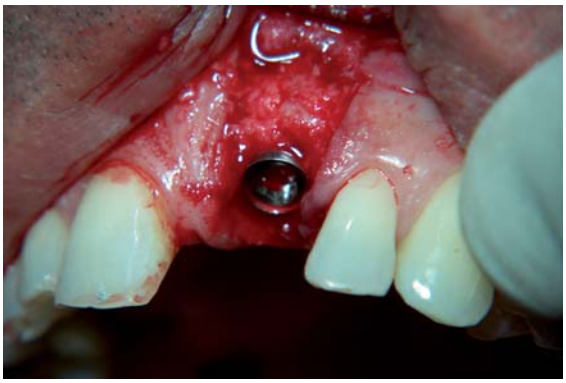

Figure 5
Implant inserted. The vestibular defect is solved by autologous bone.

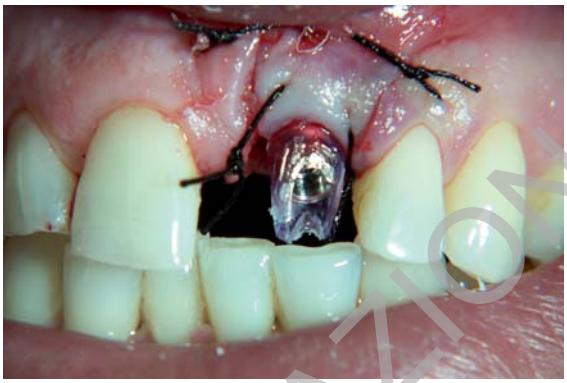

Figure 7
Plexiglass abutment ready for the cementation of the provisory crown.

Figure 6
At the end of the surgical stage a temporary castable abutment made of plexyglass is placed on the implant top.

Figure 8
At the end of the surgical stage the provisory is cemented.

"jumping distance" developed by Knox (4,5) are very important to the aims of the osseointegration and of the possibility of immediate-loading of a post extractive implant. "Jumping distance" means the distance between the implant surface and the surrounding alveolar walls: if such gap is upper than 0,5 mm, you can not forecast the bone deposit on the surface of the implant without the use of membrane and regenerative procedures.
During the treatment of the aesthetic areas, such as the frontal jam region, even if there is the way of the alveolus, it is important that the preparation of the implant site is made to the detriment of palatal wall to preserve the most possible the vestibular side, very important for aesthetic aims. To reach the primary stability it is very important to choose carefully the shape and the dimension of the implant.
Recently the literature has introduced some studies which evaluated the dimensional variations of the soft tissues and the gingival recessions often associated with the second surgery phase, that means to the exposition of the fixture and of the placement of the abutment. In these works the Authors described the possibility of disadvantageous morphological variations in the aesthetic areas, especially in the subjects with thin biotype (6-10). These results underline even more the importance of the post-extractive implant, in order to, if it is possible, save the aesthetic of the gingival tissues.

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Firstly, the stiff operative protocols fixed for the post-extractive implants did not included the tooth that presented clinical and radiographical signs of infections (11). Actually some researchers have begun to insert implants also during such disadvantageous conditions, except for a light curettage and of a wash with antibiotical solutions of the post-extractive alveolus. The results have not showed any difference during the healing of these implants respect to the ones realized after the extraction of the elements not characterized by infections (12, 14, 15).
Moreover, you have to take into account the great approval that such therapeutical approach has in patients since it reduces the treatment period, halves the surgical stages, and let an immediate prosthetic rehabilitation with huge aesthetic and functional advantages (18-20).

Case report

A non-smoking adult patient with a negative anamnesis came to our clinic with a vestibular fistula near the dental unit 2.1, which had been devitalized and restored by a Richmond crown. After removing the crown and verifying that the underlying abutment was carious and did not allow a further rehabilitation, we decided to extract it and to place an immediate-loading and post-extractive implant.

The extraction was made atraumatically and observing the protocol provided for the immediate-loading. The dislocation was made by a straight tooth-root elevator and the extraction was made by a forceps. To prevent the spread of the infection, a careful and delicate curettage of the alveolus was performed. During this cleaning a bone defect along the vestibular wall of the alveolus was observed. For this reason, instead of a flapless surgery, a little flap was opened to see the bone defect and to make it accessible. According to the surgical protocol, the preparation of the implant site was made to a larger damage of the alveolar palatal wall preserving the vestibular side. The pilot drill was used to make the first drilling on the alveolar palatal wall and then the BTLock expander-compactors were used, from 1,8 mm till 4,5 mm in diameter, to place an implant 11,5 mm long and 4,5 mm in diameter. We paid particular attention in placing the implant platform at 3 mm apically from the vestibular margin of the free gum.
BTLock expanders-compactors have been chosen because of the several advantages they offer: they compact the site wall, increase the implant primary stability especially in case of porous bone, such as the superior maxillary. Furthermore they are manual instruments, so they allow a slow penetration in the bone, which assures a better directional control than the rotating tool.
The implant we chose was about 3mm longer than the extractive alveolus and it was placed in a more

Figure 9
Healing of the gingival tissues at the removal of the sutures after 8 days.

Figure 10
After 3 months the provisory is removed.

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Figure 11
Transfer inserted to realize the definitive impression.

Figure 12
Definitive abutment made in laboratory.

Figure 13
Cementation of the definitive crown.

palatal position than the natural teeth in order to obtain a better primary stability, which is a prerequisite condition for immediate-loading. The vestibular defect is solved by autologue bone, the flap was carefully closed in order to cover the whole defect but without any membrane.

At the end of the surgical stage a temporary castable abutment made of plexyglass was placed on the implant top. The abutment was prepared in laboratory to receive the provisory crown in resin, which had been realized before. The adjustment and finishing phase of the provisory on the implant has a strategic role for the final result in this kind of technique. The accuracy of the adjustment has to be great in order to condition the healing of the soft tissues and to achieve optimal aesthetical results (7, 8, 11, 12).

The provisory was checked from the functional point of view: it does not have to come into contact neither with the antagonistic teeth (neither in usual nor in eccentric occlusion) nor with the adjacent ones in order to prevent damaging micromovements for the osseointegration. At the end of the finishing and cementing of the provisory, according to the protocol, some general warnings were given to the patient: he should avoid parafunctions and masticatory loadings on the provisory and follow oral hygiene instructions at home in order to foster an optimal healing of the tissues.

Antibiotics for 6 days and non-stereoidal anti-inflammatories were prescribed. The sutures were removed after 8 days and the patient was visited every 10 days. The abutments was left undisturbed till the end of the 3rd month.

Now the implant stability is tested. As long as all the conditions are satisfied, the definitive impression in polyvinyl-siloxane by pick-up technique and screwed transfer is taken.

In the laboratory, a master model in extra-hard plaster is reproduced, on which a single abutment is realized by castable abutments. On the single one a gold cap is realized. Position and thickness of the abutment and of the whole structure is tested in the patient's mouth. A position impression in polyvinyl-siloxane is now taken to let the laboratory a better ceramization of the whole structure. Finally the abutment is fixed by a torque of 35 Ncm and the definitive crown is cemented.

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Figure 14
Control at 3 months.

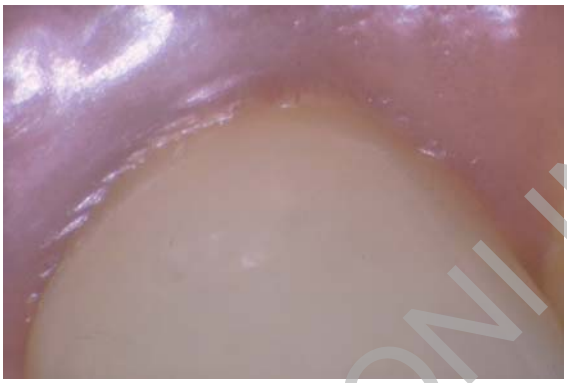

Figure 15
Control at 3 months: by a greater magnification you can notice the perfect healing of the periodontal tissues.

Conclusions

Recent works appeared in literature and our clinical experience let us declare that post-extractive implants are today a reliable alternative in the traditional implantology. However, to reach satisfactory results is necessary to select carefully the clinical case and to follow strictly the surgical and the prosthetic protocols. The greater difficulties compared with the conventional procedure require a well-trained team able to control the surgical and the prosthetic problems, that the immediate-loading post-extractive implants determines.

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