

INDICATIONS IN IMMEDIATE LOAD IMPLANTS CLINICAL STUDY

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Abstract: Objectives: This study aims at revealing ways of immediately implants loading, the indications and contraindication of this technique, some evaluations about the success rate of immediate loading of implants. Material and methods: The prospective study belongs to a Research Programme of Polissano Clinical of Sibiu (General director Dr. Ilie Vonica) and “Lucian Blaga” University of Sibiu We tested different batches of patients, distributed by age, sex, bone offers, prosthetics loading, insertion technique, surviving rate of Wital (Fa. Wieland, Germany) endo-osseous implants. In this paper, two batches of patients were analysed: a batch of 12 patients whom we inserted 25 implants loaded immediately after insertion, and 25 implants, precociously loaded 6 weeks after insertion. In both cases, implants had been inserted immediately after extraction.

Results : After we analysed all the patients who were treated with 50 Wital implants inserted immediately after extraction, we established: none of these patients have any complications irrespective of the treatment – immediately loading or after 30-45 days after insertion; The prosthetic bridge must be in infraocclusion; There is very important that the patients should observe the protocol of dispensarization.

Conclusions: We consider that in order to complete the practical applications of the immediate loading concept, experimental studied are still needed, before this therapeutic approach became a routine activity in oral implantology.

Keywords: implant, immediate loading

Rezumat: Obiective: Acest studiu evidențiază situațiile în care putem realiza încărcarea imediată, indicațiile și contraindicațiile acesteia, precum și unele evaluări legate de rata de succes a implantelor dentare cu încărcare imediată. Material și metoda: Studiul prospectiv aparține unui Program de Cercetare al Clinicii Polissano Sibiu (Director General Dr. Ilie Vonica) și Universitatea Lucian Blaga Sibiu în care se va analiza pe diferite loturi de pacienți, distribuți pe grupe de vârstă, sex, grad de ofertă osoasă, timp de încărcare protetică, tehnici de inserție, rata de supraviețuire a implantelor endoosoase Wital (Fa. Wieland, Germania). În prezentul articol sunt analizate două loturi de pacienți la care am inserat 50 de implantate Wital: un lot de 12 pacienți la care am inserat 25 de implantate încărcate imediat după inserare și 25 de

implante încărcate precoce la 6 săptămâni de la inserare. În ambele situații implantele au fost inserate imediat postextracțional. Rezultate: după analiza pacienților la care s-au inserat 50 de implanturi Wital imediat postextracțional avem următoarele rezultate: nu au apărut complicații în timp indiferent de tipul de tratament – încărcare imediată sau la 30/45 de zile de la inserție; lucrarea protetică provizorie trebuie să fie în infraocluzie; este foarte important să se respecte protocolul de dispensarizare Concluzii: Utilizarea implantelor moderne cu suprafețe rugoase tratate special prin gravare cu acizi organici cum sunt implantele Wital, permit încărcarea acestora fie imediat după inserție fie la o lună fără riscul pierderii acestora Considerăm că pentru completarea aplicațiilor practice ale conceptului de încărcare imediată mai sunt necesare studii experimentale înainte ca această abordare terapeutică să poată fi o rutină în Implantologia Orală

Cuvinte cheie: implant, încărcare imediată

INTRODUCTION

The immediate loading is, from the patient's point of view, the insertion and the application of the prosthetic work based on the dental implant in the same session. The surgical and restorative protocols consider that the interval between the implant insertion and the moment of the ceramic restoration placement should be of maximum a month. Meanwhile the patient has a provisory prosthesis consisting of a dental piece with a slight loading to avoid the centric contacts but also the ex-centric (paraxial) ones. Thus the potential of functional solicitation decreases.

Retrospective and prospective studies have shown that the success rate of bone implants inserted and loaded in a single stage or in two stages is almost equal and is around 97-98%. The process of bone-integration is the same, maybe faster around the immediate loaded implants due to the occlusal stimulation and the insertion of the soft tissues around the implants is done through a healing simultaneous with the post operative wound.

The success of the bone-integration of the immediate loaded implant depends on:

- Its primary stability
- The maintenance of its stability during the whole healing period and of formation of a consistent bone

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interface to cancel the resorption of the cortical consecutive to the implant insertion.

Also, the primary contact surface between the bone and the implant should increase stimulating the forms of contact osteogenesis proved through human histological studies.(Davis 2002)

The temporary immediate loading creates micro-shocks in the tissular interface bone/implant and without yet being able to prove how wide these movements are or the part of the mastication in these micro-movements. Experimentally it has been noticed that they stimulate the osteogenesis by increasing the differential degree of the forerunners of the osteoblasts.

A differential must be done between the immediate loading and the early loading. The immediate loading assumes an excellent primary stability which allows the application of a temporary prosthetic restoration in the same session with the insertion respecting the bone-integration.

The early loading assumes an acceptable primary stability (20-30 Ncm) in the implant insertion, its loading being done at 2-4 weeks after the insertion after the beginning of the osteogenesis and the finalization of the osteointegration.

Obtaining a high level of primary stability of the implant assumes respecting a few surgical protocols recently described by SALAMA and SAADOUN who present the following as being the key elements in the success of an intervention

- The preoperative evaluation of the bone surrounding the implant through measurements, clinical and paraclinical investigations (OPT, CT, CTV, CT with simulation of the implant insertion and the secondary processing of the data, wax-up samples, surgical guide etc.)
- Limited uncovering
- Choosing implants with design suitable for the bone density
- The careful preparation of the bone seat (strong external and internal irrigation, pointed drills, revolution adapted to the bone hardness)
- Using the osteotomes in bones with low density
- The screw type implants ensure a superior primary implantation and they are inserted remaining with the smooth surface of 1 mm above the crest cortical thus favourising the positioning and adherence of the soft tissues in the cervical area.

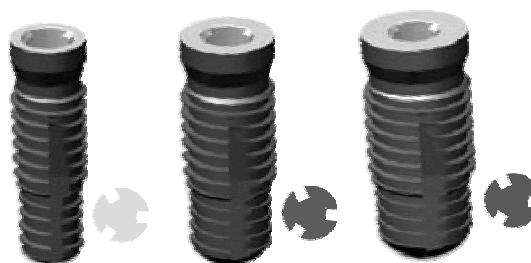
In our study regarding the immediate loading we have considered that the values of the "Torque" in the insertion should not be below 35Ncm and should not go beyond 45Ncm constantly considering the bone density around the implant seat. The evaluation of the bone density can be estimated from the panoramic radiographies especially after the secondary processing of the data in volumetric CT or clinically through a tactile evaluation when screwing the key or through the palpation and inspection of the alveolar crest revealed through uncovering. Also we can use a very simple method to check the primary stability by shaping the

"torque" reversibly but not be below 25 Ncm with the dynamometric manual key or by using the phisiodipenser set on reverse revolution. In the clinics where there is a periostest, the values between 2.5-3.5 allow the immediate prosthetic loading.

The rough surface of the modern titanium implants is made out of Titanium Oxide plasma (TPS-titanium plasm sprayed) carved with organic acids or polished with titanium oxide creating heterogeneous force fields around the functionally loaded implants simulating the bone neo-formation.

This is why we have chosen one of the modern implants used today such as the Wital implant (picture no. 1) in order to study a few applications of the immediate loading concept.

Picture no. 1 Wital ImplantS (Fa. Wieland Wiernsheim Germania)



It is known that in the first 3-6 weeks from the insertion there is a drop in the primary stability of the implant; previous studies have proved that most of the failures in the immediate loading appear around the fourth week after the implant insertion.

In this study we have strictly respected the rules of the gradual implant loading unanimously accepted by the majority of practitioners which can be summarized as following:

- A moderate and controlled loading of the implants stimulates and produces osteogenesis
- The overloading becomes harmful and its association with wide movements induces and sustains the bone resorption.
- A slight loading without functional occlusal contacts induces and sustains the tissular atrophy.

To avoid another complication in the integration of the immediate loaded implants, the vestibular alveolar bone resorption, we have always inserted the implants in the crests above 6mm wide and we have avoided to make the vestibular wall of the neo-alveol below 1.5mm thus preventing the consequent resorption phenomenon.

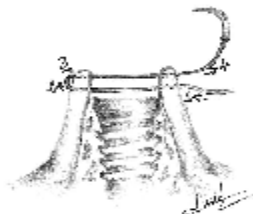
There is another risk which must be avoided: the peri-implantitis. This is why the implants have been inserted to an optimum depth, being stitched without tension and by using only "mattress" stitches simple or modified (the mattress stitch with the apical vertical repositioning) perfectly adapted to this type of insertion.(pictures no. 2,3)

Also, we have not neglected the abutment fixing stage

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We have used temporary abutments (peek abutment) out of Teflon (PCTF) which we have fixed with the dynamometric key from 20 Ncm (picture no. 4)

Picture no. 2. The vertical stitch “mattress” type



Picture no. 3 The mattress stitch with the apical vertical repositioning



Picture no.4. Fixing the temporary abutments at 20 Ncm (Dr. V. Nicolae' archives)



- We have used blunts with conic insertion and fixed within screws
- The definitive blunts have been tightened at 30 Ncm to avoid the retrograde bacterian colonization in the abutment/blunt interface
- We have used retroalveolar X-rays where there were doubts concerning the firm position of the abutments in the implants
- The edges of the temporary prosthetic work have not been placed up to the bone-implant interface; the peek abutments being white, the aesthetic effect is maintained .
- We have avoided using the abutments without shoulder with subgingival aesthetic effect (UCLA) to avoid creating an interface which allowed the bacterial infiltration at the bone crest level.
- Wherever there was the possibility, we have used titanium abutments (peek-abutments) with higher shoulder in order to place the edge of the crown further from the peri-implant mucosa
- The prosthetic works which have usually been made out of termopolimerisable acryl have been perfectly

adapted and polished avoiding the retention and settling of the bacterial plate or the contact of the acryl with the soft tissues around the implant

We have eliminated the dental contacts in maximum intercuspitation when the implants are protected by a stable relation of the remaining teeth; example the unidental implant (pictures no. 5,6,7,8)

Picture no. 5. The insertion of the implant immediately after extraction (Dr. V. Nicolae' archives)



Picture no. 6. Augmenting the bone deficiency with granular graft Bio-Oss (Dr. V. Nicolae' archives)



Picture no. 7. Fixing the peek abutment and stitching the wound (Dr. V. Nicolae' archives)



Picture no. 8. Bonding the temporary work (Dr. V. Nicolae' archives)



- We have avoided, whenever possible, the development of contacts during the functional movements
- The control of the occlusion has been done during the whole period of dental check-up (the second day, after a week, after 2 weeks, after 4 weeks)
- The bonding of the temporary prosthetic work has been done with non-eugenol cements (Temp Bond type) protecting the peri-implant sulcus; and the ceramic works have been fixed with permanent

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cements (Fuji type, or GCEM type with piston and Medimex recipients)

MATERIALS AND METHOD

In our study, the 50 Witall implants have been inserted to patients: 25 implants have been immediately loaded postoperative or 2-3 days after and the other 25 implants have been loaded 3-4 days after insertion. These have been followed for 18 months. For the homogeneity of the study we have only used Wieland implants (full screw implant) out of Titanium with a 1mm smooth neck.

The Titanium implants (Nuance 4 – 1530 – 5832- /N) with a maximum of 0,4% oxygen, 0,5% iron and 0,015% hydrogen are very resistant implants with a high module of elasticity obtained out of Titanium pressurized in low temperature (sinterization).

The surface is TPS and carved with organic acids having extra comparing to the Titanium 9% oxygen , 0,1% nitrogen and 3% carbon.

The technique of insertion was the following: after the local anesthesia-subperiosteal infiltration- the incision and uncovering of the mucous flap has been done, the alveolar crest has been smoothed and the placement spot of the implants has been marked with a spherical drill under constant cooling with physiological ser. The pilot drill and the sword drill create the direction and the depth of the implant seats which are checked through pines of parallelism and marking probes. The mechanical insertion or with the manual key of the implant and the stitch with the repositioning of the flap is then done. Where the bone had a D4 or D3 density we have used the osteotomes for compacting the bone walls and creating the implant seat succeeding in the same time a lifting of the Schneider membrane in the lateral maxillary area being able to insert the implants without entering the sinus.

Immediately after the intervention on the implants there have been placed the standardized transfer devices for a closed or open tray which correspond to the diameter of each implant. It is taken an impression of the prosthetic field for the preparation of the abutments in the same day. We have had situations when the provisory abutments only needed shortening, in this case the temporary crown has been confectioned by us in the dental practice using prefabricated acrylic coping from sets. (pictures no. 9,10,11,12)

Picture no. 9. Fixing the Peek abutments immediately after the implant insertion(Dr. V. Nicolae' archives)



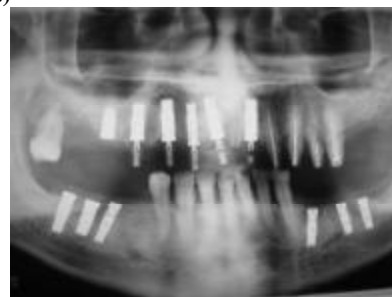
Picture no. 10 shaping the abutments with a drill (Dr. V. Nicolae' archive)



Picture no. 11 Taking the occlusion (Dr. V. Nicolae' archives)



Picture no. 12 Postoperative OPT(Dr. V. Nicolae' archives)



The second day in the compulsory postoperative check up , the abutment prepared in the laboratory is fixed and the temporary prosthetic work is bonded. Where the primary stability has been between 30-35 Ncm we have loaded the implants in a month after the insertion. Where there was an increased primary stability, especially in the mandible in the frontal area we have replaced the temporary prosthesis with the definitive one two months after the insertion.

The study has also considered :

- The plate index according to Mombelli's criteria taking into consideration the adherent plate from the crowns on the implant too
- The gingival index evaluating the degree of inflammation of the mucous surrounding the implant
- The bleeding on palpation –if at 20 seconds after introducing the periodontal probe in the gingival sulcus there is bleeding, it should be noted in the charts.
- In every check-up session there has been done a test

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regarding the attitude of the patients towards the way this type of treatment is done.

RESULTS AND DISCUSSIONS

The study has been done in the Dental Practice from the emergency Military Hospital from Sibiu, clinical structure belonging to the Lucian Blaga University, Victor Papiilian Medicine Faculty where we have inserted the 50 implants to the patients with ages between 42 and 68 years.

The immediately loaded implants have been inserted in the case of the unilateral edentulousness-sometimes after extraction and the rest in partial maxillary and mandible edentulations. The patients have been supervised on the whole study period during 18 months.

Not one single implant has been lost and the other investigations indicate:

1. The plate index- 64% of the patients did not have bacterial plate and only 16% had plate index 3 which (after Mombelli becomes worrying)
2. The gingival index was missing in 85% of the implants and in 5% the index was between 2 and 3 to more than 2 out of the four faces of the implant
3. The bleeding with the periodontal probe: only in two of the implants there is bleeding, in the rest, the bleeding is absent
4. The periodic tests in 1 year and a half warned us that not all the patients respect the rhythm of the periodic check up and the techniques of oral hygiene (waterjet washing, mechanical brushing) but most of them are satisfied find the aesthetic aspect and the functionality of the prosthesis satisfying.

The immediate implant loading contradicts the hypothesis of the "clinical silence" of 4-6 months necessary to the bone healing, valid hypothesis after introducing the concept of osteointegration of I.G. Bränemark and the one of the functional ankylosis of Shróeder.

Authors like Federmann on a study on 411 patients with 1523 Strauman implants immediately loaded has a success of 92,8% in 1998.

In a study done by Randow and his collaborators on 88 implants placed interforaminal in 16 patients and immediately loaded, he has noticed that they still required 18 months from the insertion for clinical stability.

Connecting with the other studies our results are similar but this study has used a smaller number of implants not being a multicentric study and following the evolution of the implants on a shorter period of time. This study however is part of a wider research program and it will continue.

CONCLUSIONS

Based on these results and on the ones obtained in other clinics it can be noticed that in patients with partial edentulousness, the Wieland Implants with immediate loading in areas with favourable bone offer can offer excellent long term results.

In these cases the placement of the prosthesis has

been done immediately and there was no need for healing (4-6months) uncomfortable period and hard to overcome by most of the patients.

All these have been possible due to:

- A quality implant
- Respected surgical protocols
- Temporary restorations with protocols of gradual loading
- The elimination of the occlusal stress and of the inflammatory repeated complications
- Respecting the check-up program by the patients

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