



TOPIC

“ Immediate loading revisited with the concept of intraoral welding.”



Presented by

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INDIA

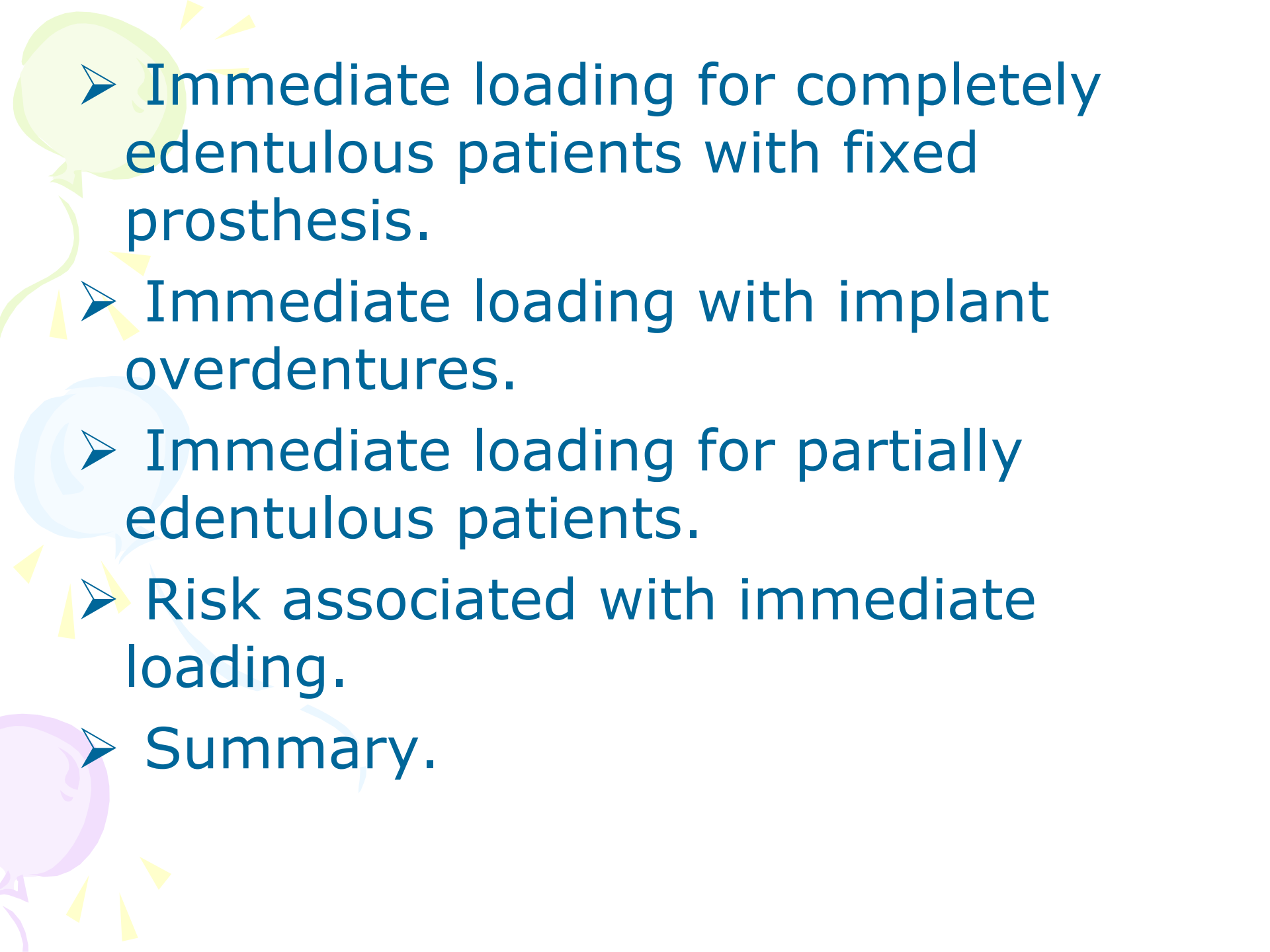
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B. INTRA-ORAL WELDING

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- Indications, contraindications, advantages & disadvantages
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- Immediate loading for completely edentulous patients with fixed prosthesis.
 - Immediate loading with implant overdentures.
 - Immediate loading for partially edentulous patients.
 - Risk associated with immediate loading.
 - Summary.

➤ Introduction

“Immediate loading” is a procedure where the surgeon may opt to build the tooth's crown right away after placing the implant into the jaw, or employing a “fixed prosthesis,” without the intervening recovery time for osseointegration.

➤ What was the need ?

- ❑ **Concept was introduced to reduce treatment visits, to eliminate second stage surgery and provide prosthesis immediately for esthetic , functional and psychological well-being of the patient.**
- ❑ **Immediate loading of implants requires lots of previous experience , as well as advance knowledge of the subject and significant surgical skills.**

➤ HISTORY

- ❑ Immediate loading of implants is not a new concept, as in 1963, Dr Linkow had developed the first self-tapping endosseous root-form implants, known as the Ventplant.
- ❑ The protocol that was ultimately adopted, was to immediately load these implants with overdentures or acrylic, provisional fixed bridges.

History (cont.)

- ❑ In 1967, the endosseous blade implant, which also called for immediate loading (for splinting purposes), was introduced.
- ❑ Before 1967, Dr Linkow carefully established a protocol for immediate loading in root-form procedures.
- ❑ From 1967 to the latter part of 1999, myriad blade and plate-form implants were also placed into immediate function.

History (Cont.)

In 1997 Tarnow et al reported on immediate loading with a fixed prosthesis, using 10 consecutive completely edentulous cases over 5 years, sixty – six of 69 implants were integrated in six mandibular and four completely edentulous maxillary arches with total of 10 – 13 implants / arch. Like Schnitman et al, Tarnow et al did not immediately load all the implants for the transitional prosthesis.



History (Cont.)

□ Henry and Liddelow in 2008

conducted a **review on immediate loading** in implants. Systematic reviews and controlled clinical trials from 2000 were included in the study. It was concluded that substantial evidence exists to demonstrate high survival rates of immediate loading protocols and it may be cautiously recommended for certain clinical situations.

➤ Relevant definitions

□ Early occlusal loading

Refers to an implant- supported restoration in occlusion between 2 weeks and 3 months after implant insertion . Though the implants were not loaded same day , but this protocol directly challenged the healing process by introducing loading during wound healing.

A fundamental goal of early loading is improving bone formation in order to support occlusal loading at two months.



Delayed or staged occlusal loading:

Refers to an implant prosthesis with an occlusal load after more than 3 months after implant insertion. This approach may use either two or one- stage surgical procedure.



❑ **Nonfunctional immediate restoration:**

Describes an implant prosthesis with no direct occlusal load within 2 weeks of implant insertion and primarily considered in partially edentulous patients.

❑ **Nonfunctional early restoration:**

Describes a restoration in partially edentulous patient delivered between 2 weeks and 3 months after the implant insertion .

➤ Rationale For Implant Loading

Surgical trauma -

- ❑ Causes of trauma include thermal injury and microfracture of bone during implant placement which may lead to osteonecrosis and result in fibrous encapsulation around the implant. **(Erikson AR, Albreketsson et al 1982)**
- ❑ The bone interface is stronger in the day of implant placement compared with 3 months later. **(Strid KG 1985)**

Rationale For Implant Loading (cont.)

- Bone-loading trauma (cont.)

Therefore a rationale for immediate loading is not only to reduce the risk of fibrous tissue formation , but also to minimize woven bone formation and promote lamellar bone maturation . **(Parfitt AM 1983)**

Rationale For Implant Loading(cont.)

▪ **Bone loading trauma (cont.)**

- ❑ After trauma the remodelling (bone turnover) permits the repair of the bone, during remodelling process the bone mostly is lamellar but may become woven bone.
- ❑ Woven bone is unorganized, less mineralized, weaker, and more flexible. Lamellar bone is highly mineralized, strongest bone type, and able to respond to the mechanical environment of occlusal loading

Rationale For Implant loading

- Bone-loading trauma

After trauma the remodeling (bone turnover) permits the repair of the bone, during remodeling process the bone mostly is lamellar but may become woven bone.

Woven bone is unorganized, less mineralized, weaker, and more flexible. Lamellar bone is highly mineralized, strongest bone type, and able to respond to the mechanical environment of occlusal loading.

Histologic Evaluation (Short Term)

Direct bone –implant contact (BIC)

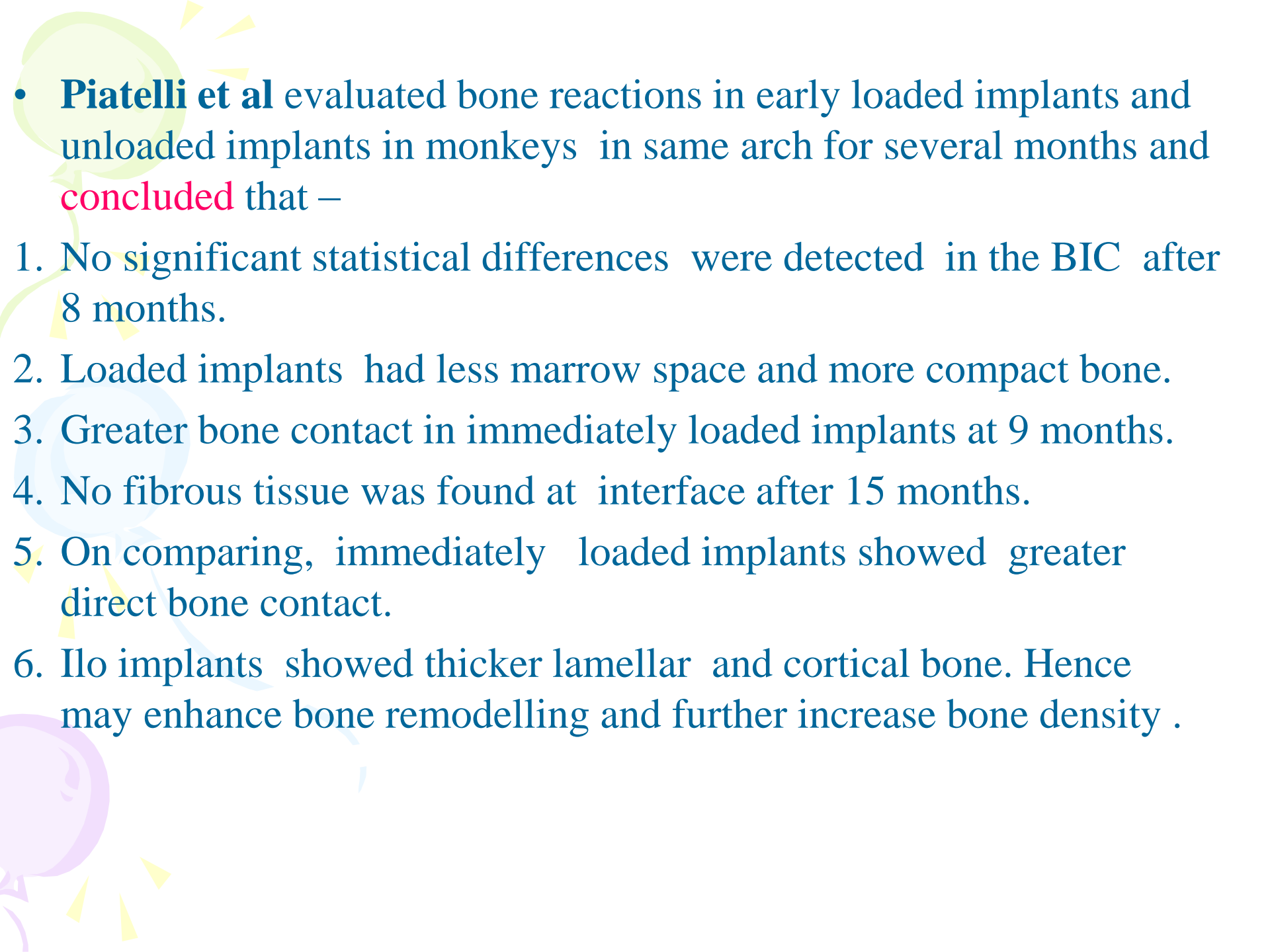
Excess stress to an implant interface may cause overload and implant failure . Hence initial histological response at bone implant interface has been evaluated .

- ❑ **Romanos et al** found no statistical difference between immediate and delayed loaded implants .
- ❑ **Sharawy et al 2000** placed paired implants in five beagal dogs, one submerged and one was attached with abutment and then immediately loaded for 4 weeks. On histological evaluation no significant difference was found in the (BIC) between submerged and loaded implants after 4 weeks of function.



Histologic Evaluation (Short Term)

Testori et al placed 2 implants in humans and immediately loaded for four months and found bone contact 78% to 85% with no epithelial migration .

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- **Piatelli et al** evaluated bone reactions in early loaded implants and unloaded implants in monkeys in same arch for several months and **concluded** that –
 1. No significant statistical differences were detected in the BIC after 8 months.
 2. Loaded implants had less marrow space and more compact bone.
 3. Greater bone contact in immediately loaded implants at 9 months.
 4. No fibrous tissue was found at interface after 15 months.
 5. On comparing, immediately loaded implants showed greater direct bone contact.
 6. Ilo implants showed thicker lamellar and cortical bone. Hence may enhance bone remodelling and further increase bone density .

INDICATIONS

- ❑ **Sufficient bone width (i.e. approx. 6 mm)**
- ❑ **Adequate bone quality (type I, II, III)**
- ❑ **Ability to achieve an adequate anterior posterior spread between the implants.**
- ❑ **Sufficient bone height (i.e. approx. 12 mm) for a minimum length of 10mm implant.**

Contraindications

- Poor systemic health**
- Severe parafunctional habits.**
- Bone of poor quality (type IV)**
- Reduced bone height (less than 10 mm)**
- Reduced bone width (less than 6 mm)**
- Inability to achieve an adequate AP spread.**

Advantages

- ❑ Eliminates the need for and maintenance of a removable provisional prosthesis.**
- ❑ Lesser patient apprehensions of being rendered edentulous.**
- ❑ Improved bone density.**
- ❑ Helps to acquire normal gingival architecture.**
- ❑ Eliminates premature implant exposure after associated with wearing of a removable prosthesis during healing period.**

Disadvantages

- ❑ **Not possible in every patient.**
- ❑ **Requires quite prolonged chair side and clinical time at a stretch both for the patient and dental practitioner.**



Team work

- ❑ **Immediate implant loading requires team work i.e. between surgical team and restoring team. Some times surgical and restoring procedures may be completed in a single visit or some times after one or two days after implant placement.**

Guidelines for Immediate Loading

❖ **Surface area factors**

❖ **Force factors**

❖ Surface Area Factors:

1. Implant Number
2. Size of implant: >Length, >Diameter
3. Implant Design
4. Implant surface condition



1. - Implant Number

*** Eight splinted implants or more are suggested for the completely edentulous maxillary arch and six splinted implants or more for the mandible – more implants if very soft bone (D4) is present or if force factors are greater (e.g. crown height or parafunction) .**



2. Size of the implants-

> Length of Implant:

□ Increase in length increases the initial stability of the bone implant interface. Most of the stresses to an implant bone interface are concentrated at the crestal bone, so increase in length does little to increase the stress that occurs at the trans-osseal region around the implant.

(Strong JT,et-al 1998)

□ Implant length is more relevant for immediate load application especially in softer bone types.

□ Increased length – engage the opposite cortical plates – implant initial stability.



□ Diameter of implant:

Large diameter implants are required in the posterior regions of the mouth. If larger diameter is not possible then bone grafting or greater implant number is suggested (e.g. two implants for each molar).

□ Compressive versus shear loads (square of plateau shaped threads) .



Implant body design (cont.)

Tapered-implant designs” disadvantages for immediate-load applications cont. :

- 1) The implant does not engage the bone until it is seated almost completely into the bone site, this reduces the initial fixation.
- 2) It has less surface area compared with a parallel-walled, threaded implant.

3- Implant design

- ❑ **High surface area implants (more threads, deeper threads)**
- ❑ **Should be more specific for immediate loading because no time for bone to grow into undercuts. Implant design affects functional surface area more than implant size**
- ❑ **Press- fit implants:(cylinder implants) exhibit less surface area, less initial stability**
- ❑ **Threaded implants even if smaller-diameter has greater surface area**
- ❑ **More threads number, greater threads depth give greater functional surface area during immediate load**

4- Implant surface condition

- HA-coated implants in poor bone density types (e.g. D4)
- Rough versus smooth or machine surface conditioning implants in good bone density situations (e.g. D2 and D3)

❖ Force factors

Following factors should be considered –

1. Patient conditions
2. Implant positions
3. Occlusal load direction



1. Patient Condition

- ❑ Parafunction, crown height, and muscular dynamics require more implant surface area. Severe parafunction may be a contraindication for the completely edentulous patient.

2. Implant position:

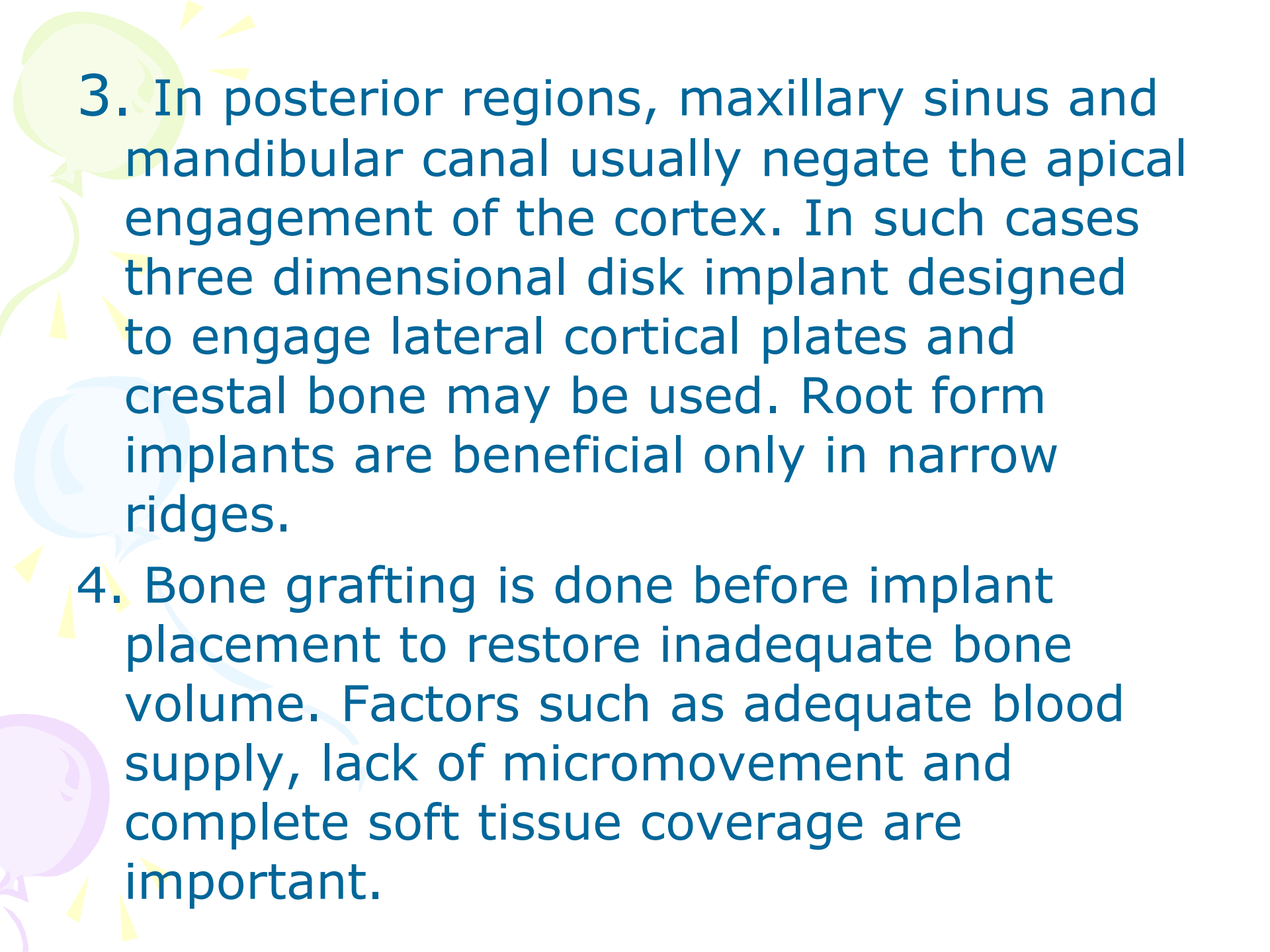
- 1. This is as important as implant no. E.g. For 2 implants supporting 3 teeth, positioning implants next to each other with a cantilever is not advisable.
- 2. In completely edentulous cases, cross arch splinting is advantageous for immediate load transitional prosthesis.
- 3. In mandible minimum 3 implants- one in the midline to cover canine-canine area and two in bilateral posterior sections required.
- 4. In maxilla minimum 5 implants- each in incisor region, bilateral canine areas and bilateral posterior region are required.

3. Occlusal load direction

1. Axially loaded implants maintain more lamellar bone and have lower remodelling rate.
2. Offset loaded implants show osteoclasts and inflammatory cells at the interface.
3. Hence posterior cantilevers should be eliminated.

Mechanical properties of bone:

1. As compared to trabecular bone, cortical bone is – (a) more dense; (b) has higher modulus of elasticity; (c) maintains more lamellar structure ; (d) has slower remodelling rate.
2. In anterior region, root form implants long enough to engage cortical bone at the crestal and apical region are advantageous.



3. In posterior regions, maxillary sinus and mandibular canal usually negate the apical engagement of the cortex. In such cases three dimensional disk implant designed to engage lateral cortical plates and crestal bone may be used. Root form implants are beneficial only in narrow ridges.

4. Bone grafting is done before implant placement to restore inadequate bone volume. Factors such as adequate blood supply, lack of micromovement and complete soft tissue coverage are important.

Immediate - Loading for completely edentulous cases with fixed prosthesis

Two Different Options -

- 1-The **1st option**- loading of the implants the same day of surgery.
- 2-The **2nd option**- Implants placement and impression same day, then at the suture appointment (7 to 14 days later) the transitional fixed prosthesis.
 - ❑ No cantilever beyond esthetic zone.
 - ❑ Implants sites- LOWER JAW (bilateral premolars and incisors area) UPPER JAW(bilateral canine and molar area)
 - ❑ After healing 4 to 8 months (depends on bone density) the transitional restoration may be cut off and the final prosthesis fabricated

Implant overdentures

- ❑ After insertion implants are joined with a bar, overdenture is hollowed out and a soft conditioner is placed over the bar.
- ❑ Advantages- 1. Restoration may be removed at night, so risk of nocturnal parafunction eliminated. 2. Soft tissue support may act as stress relief system for rigid implants.
- ❑ After 3 months or more, final restoration may be fabricated.

Immediate loading for partially edentulous patients

N-FIT Concept
**(Nonfunctional Immediate
Teeth)**






❑ Its an acronym for Non-Functional Immediate Prosthesis.

❑ It utilizes the immediate loading concept in partially edentulous cases.



❑ It was first suggested by Misch in 1998.


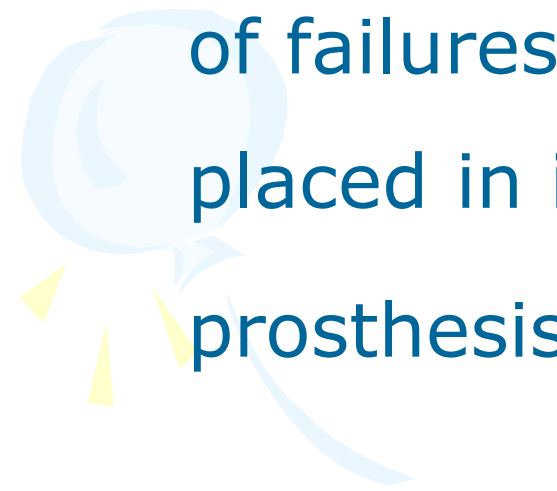


❑ It presents a similar approach to the immediate loading technique for completely edentulous patients with two exceptions:



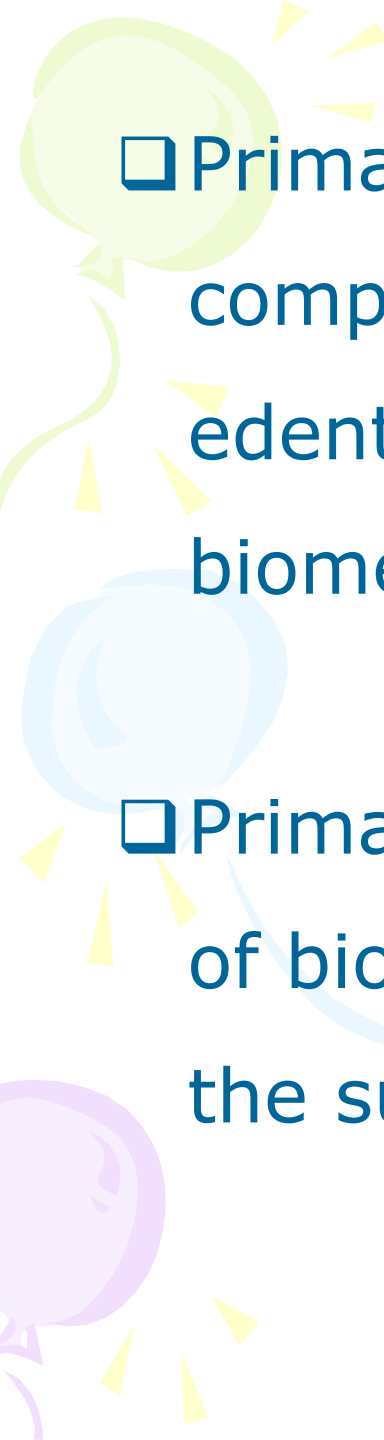
□ Exception -1

Rather than submerging more than half the implants or placing extra implants in case of failures, ideal number of implants are placed in ideal locations for the final prosthesis.



❑ Exception -2

Unlike immediate loading in completely edentulous patients, implant supported transitional prosthesis is placed out of opposing occlusal contacts during the healing period.

- 
- ❑ Primary advantage of N-FIT concept compared with immediate loading in edentulous cases is the decreased risk of biomechanical overload from parafunction.
 - ❑ Primary disadvantage is the increased risk of biomechanical overload compared with the submerged, countersunk approach.

Indications

- ❑ D1,D2,D3 bone in implant placement site.
- ❑ Screw shaped implant bodies, 4mm or more in diameter with increased surface area designs to decrease crestal stresses.
- ❑ Partially edentulous with centric occlusal contacts and excursions on natural teeth.

Contraindications

- Completely edentulous condition
- Patients with parafunctional oral habits

Advantages

- ❑ Immediate fixed esthetic advantage soon after Stage 1 surgery.
- ❑ Stage 2 surgery is eliminated.
- ❑ Implants are splinted during initial healing for biomechanical advantage.
- ❑ Countersinking the implant below the crestal bone is eliminated, which reduces early crestal bone loss.
- ❑ Soft tissue emergence profile may be developed with the transitional prosthesis.

Disadvantages

- ❑ Micromovement of implant that can cause crestal bone loss or implant failure is greater than with two-stage approach.
- ❑ Dentist is less likely to evaluate implant crestal bone directly as Stage 2 surgery is eliminated.
- ❑ Parafunction from tongue or habits is detrimental.
- ❑ Too soft bone, small diameters, implant design with less surface area may cause too great crestal bone loss or implant failure.
- ❑ Impression material or acrylic may become trapped under tissue or between implants and crestal bone.

Risk of immediate loading

The primary risk of immediate loading is the risk of implant failure or greater crestal bone loss around the healing implants and should the implant fail a total of 12 appointments are associated with the implant failure over 6-8 months.

Summary

- ❑ A benefit/risk ratio may be assessed for each patient condition to ascertain whether immediate occlusal loading is a worthy alternative.
- ❑ The greater the benefit or lower the risk, more likely immediate loading is considered.
- ❑ Majority of clinical reports reveal similar survival rates between immediately loaded and two-stage unloaded healing approaches.
- ❑ The biomechanical treatment approach to increase surface area and decrease forces applied to the immediate restorations is most likely the major reason for high implant survival.



Part - B

- ❖ Intraoral laser welding
- ❖ Syncrystallisation




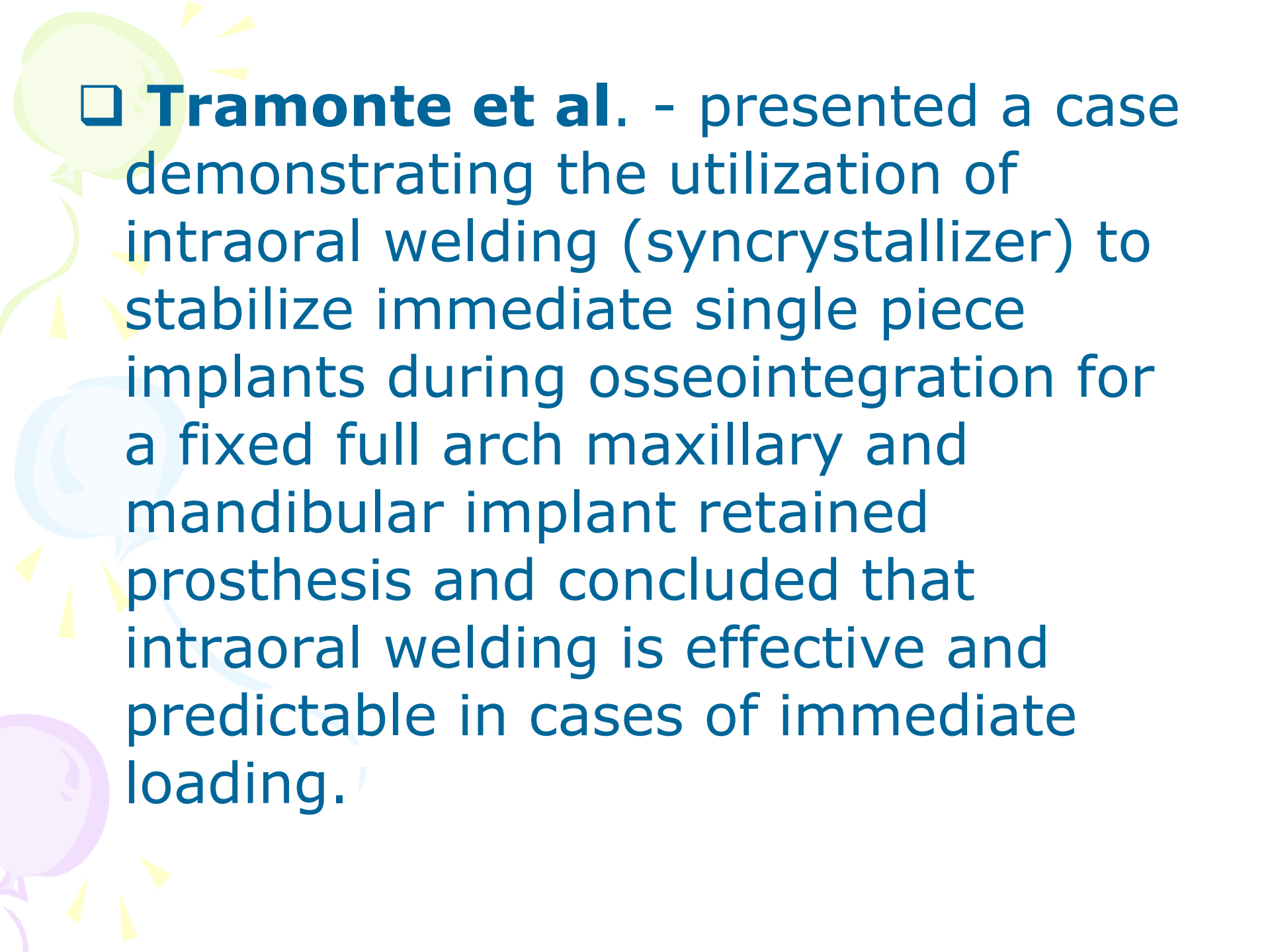
❖ Intraoral laser welding

- ❑ Review of literature
- ❑ Advantages over traditional welding
- ❑ Advantages over syncrystallisation

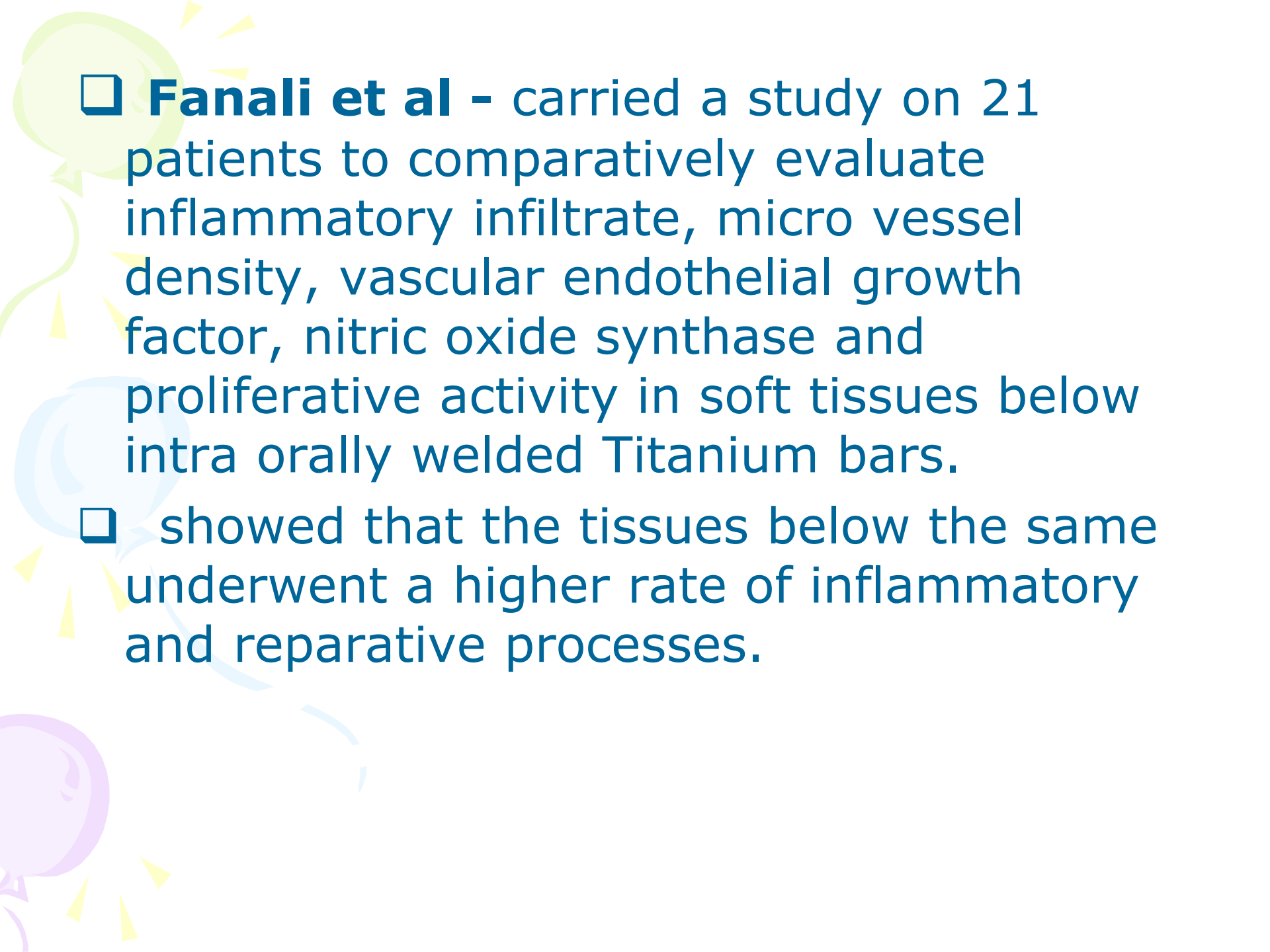


REVIEW OF LITERATURE

- ❑ **Gordon (1967)** – welded metallic portions of dental prosthesis with laser technology.
 - ❑ **Marchesi marcello at-al** -(Implant dentistry - Feb 2015 v 24 – issue 1-p 110-116) did a study on 17 pt with the concept of immediate loading with intraoral welding on only four implants with maxillary edentulism for 26.5 months follow up. Only two implants were lost giving an implant survival rate of 97 % . All the prosthesis remained in function and the prosthetic success was 100%.
- 



□ **Tramonte et al.** - presented a case demonstrating the utilization of intraoral welding (syncrystallizer) to stabilize immediate single piece implants during osseointegration for a fixed full arch maxillary and mandibular implant retained prosthesis and concluded that intraoral welding is effective and predictable in cases of immediate loading.

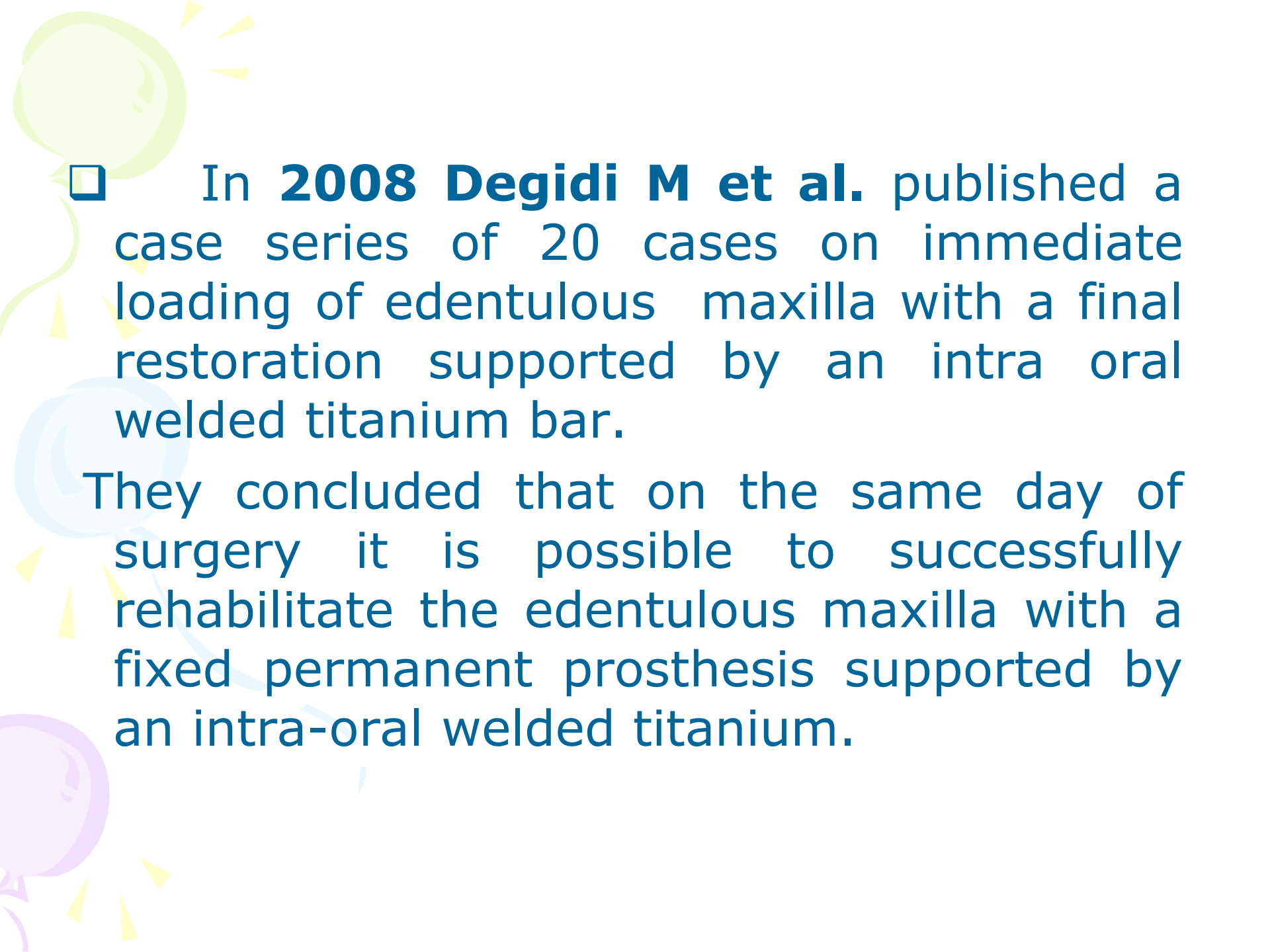
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- ❑ **Fanali et al** - carried a study on 21 patients to comparatively evaluate inflammatory infiltrate, micro vessel density, vascular endothelial growth factor, nitric oxide synthase and proliferative activity in soft tissues below intra orally welded Titanium bars.
 - ❑ showed that the tissues below the same underwent a higher rate of inflammatory and reparative processes.



□ **Fornaini C et al. in 2010** conducted an in vitro study on calf jaws to evaluate the thermal increase in intraoral laser welding.

□ The study showed that thermal increases in pulp chamber, sulcus, root and bone were biologically compatible and that intra-oral laser welding at the parameters used in this work, seems to be harmless to the biological structures close to the welding and thermally affected zones.

- ❑ **Degidi M et al.** conducted a 3-year prospective study in 2010 to evaluate the concept of intraoral welding as a suitable technique for the placement of a final restoration in the edentulous patient on the same day of surgery.
- ❑ The study was conducted on 26 patients with edentulous maxilla and 34 patients with edentulous mandible who were consecutively treated with 324 immediately loaded implants. It was concluded that on the same day of surgery it was possible to successfully rehabilitate the edentulous patient with a fixed definitive prosthesis.



□ In **2008 Degidi M et al.** published a case series of 20 cases on immediate loading of edentulous maxilla with a final restoration supported by an intra oral welded titanium bar.

They concluded that on the same day of surgery it is possible to successfully rehabilitate the edentulous maxilla with a fixed permanent prosthesis supported by an intra-oral welded titanium.



□ **Degidi M et al. in 2012** conducted a prospective study to assess the suitability of immediate rehabilitation of the edentulous mandible using SynCone copings and the intraoral welding technique.

□ Within its limitations, the study demonstrated that it is possible to successfully rehabilitate the edentulous mandible on the day of surgery with a definitive restoration supported by an intraorally welded titanium framework and SynCone 5-degree abutments.

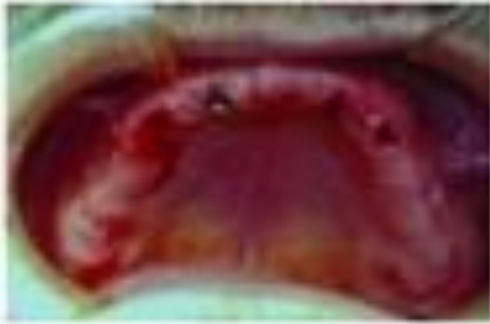
Advantages over traditional welding

- ❑ Can be carried out directly on master cast thereby eliminating risk of inaccuracies due to duplication of the model.
- ❑ Heat source – concentrated high power light beam – potential for distortion of prosthetic components minimised.
- ❑ Possibility of welding adjacent to acrylic resin or ceramic parts with neither physical cracking nor colour damages.
- ❑ Reducing work load by eliminating necessity for remaking broken prosthetic appliances.
- ❑ Laser welded joints – high reproducible strength.

Advantages over Syncrystallisation

- ❑ It is effective on all metals rather than only on titanium and its alloys .
- ❑ It can be applied with or without filler metal and shielding gas where as Syncrystallisation is based on creation of electric arc between two electrodes under an **argon gas** flux.
- ❑ It can be easily used on patients with pacemaker whereas syncrystallisation cannot be used.
- ❑ Due to extremely small spot size of the beam(0.6 mm) higher temperatures are restricted to a limited area whereas in the welding process some energy spreads to adjacent area(teeth, acrylic,ceramic).
- ❑ Cost effective – does not require a new and specific appliance – laser unit for oral treatment can be used.

Case presentation with Nd:YAG Laser



ABUTMENTS SCREWED ON 4 IMPLANTS



I/O Laser welding
Of abutments.




Extraoral welding of
Framework.



Finished framework



❖ Syncrystallisation

- ❑ Rationale for syncrystallisation
 - ❑ Principle of action
 - ❑ Modern intraoral welding protocol
 - ❑ Intraoral welding machines and tools
 - ❑ Materials used for cross arch stabilization
 - ❑ Case presentation involving syncrystallisation
- 

RATIONALE FOR SYNCRYSTALLISATION

- ❑ It has been suggested that a movement of $30\mu\text{m}$ or less has no adverse effect on osseointegration, while a movement of $150\mu\text{m}$ or more results in soft connective tissue apposition to the implant.

FACTORS TO LIMIT MICROMOVEMENTS


- ❑ Accurate presurgical diagnostics and treatment planning,
- ❑ Implant macro- and microdesign,
- ❑ Adequate fixation and immobility of the implant are of utmost importance to prevent the risk of micro-movements related to the surrounding bone.
- ❑ Rigid splinting seems to have a significant impact on the peri-implant tissue response since it is able to reduce the mechanical stress exerted on each implant.

Principle of action

- ❑ This device has a very simple working principle. In order to weld two metals it uses the **Joule effect**, according to which the current passing through a resistance is completely transformed into heat equal to $I \times I \times R \times T$ (I is the current passing through the resistance R during time T).
- ❑ The **total resistance** is = resistance of the metals to be welded + contact resistance between those metals. The contact resistance is much higher than the metal resistance, so that most of the power, and heat thereby, will be localized exactly on that point.
- ❑ The contact resistance between electrodes and metals as well as the resistances characteristic of the electrodes must be **smaller** than the resistance between the metals to be welded so that all the power is localized on the welding point and is not dispersed along the remaining parts of the discharge loop.



Principle of action

- ❑ For this reason it is strongly recommended to keep the electrodes, the tongs and the contacts of the **connecting cables clean** and in a good state of maintenance.
 - ❑ As the **total resistance is very small**, it is necessary to supply high currents to produce enough energy and, thereby, **enough heat to melt** the metal.
 - ❑ The current necessary to weld two metals in this way is provided by a current pulse.
 - ❑ Two additional important aspects must be taken into consideration: the **welding surface** and the duration of the energy application. If energy is supplied on a very small contact surface between metals, the energy density, defined as energy per surface unity, will be very high;
- 

Principle of action

- ❑ As a consequence , it will be possible to **localize** it on a very **small area** and produce an important temperature increase.
- ❑ The **other parameter** to be considered is **duration**. Too long a duration would allow heat to spread within the metals, as they are notoriously good conductors. The metal volume would increase, therefore the temperature necessary to melt metals would not be reached. On the other hand, too short a current pulse would not allow heat to spread enough within the metals, causing a superficial effect and a poor quality weld. Therefore, the current pulse has been set to last enough time to assure the best possible quality of welding.
- ❑ The welder can also produce a **reduced current pulse**, to pre-heat the materials before the actual welding current pulse is produced, in order to produce high-quality welding even with thick metals.

Modern Intraoral welding protocol

- ❑ Reported by Mondani and Mondani and Hruska
- ❑ The Welding process is subdivided into three stages:

Preparation stage

- ❑ - The two electrodes of the welding pincers are placed on either side of the bar and the abutment, both of which must be clean and free of any surface oxidation.
- ❑ - Firm and constant pressure must be applied to ensure a perfect joint between the parts to be welded .
- ❑ - Presence of water or saliva does not compromise the quality of welded joint.

Welding stage

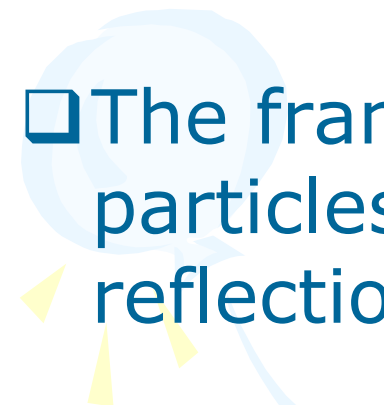
- ❑ An electrical charge from a previously unloaded capacitor is transferred to the copper electrode of the welding pincers.
- ❑ Electrical current supplied to the electrodes instantly raises the temperature of the two titanium components to fusion point.
- ❑ Welding is performed without the use of filler metal and takes 2 to 5 milliseconds to carry out.

Cooling stage

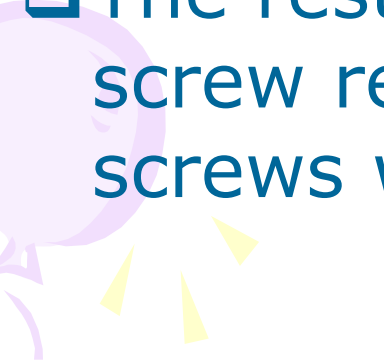
- ❑ Due to different thermal conductivity of the titanium parts (19 watts per kelvin per meter) and copper electrodes (386 watts per kelvin per meter), the process is performed without producing any discomfort to the patient or damage to the surrounding tissue , as no perceptible heat is transmitted to the peri- implant area.
- ❑ Copper electrodes dissipate all the heat that is generated.
- ❑ During this stage , the titanium crystallizes and Therefore the bar and the abutment must be kept under firm pressure.



□ The framework created by welding the titanium bar to implant abutments was removed and passivity of whole structure was checked with sheffield 1 screw test.



□ The framework was then abraded with airborne particles and opaqued to avoid metal light reflection through the acrylic resin .



□ The restoration was trimmed , polished and screw retained the same day by fastening screws with 20 Ncm torque.

WELD -ONE / Intra oral welding machine



Provides a stable passively fitting framework for temporary/ durable prosthesis for Immediate restorations

SWISS & WEGMAN I/O WELDING



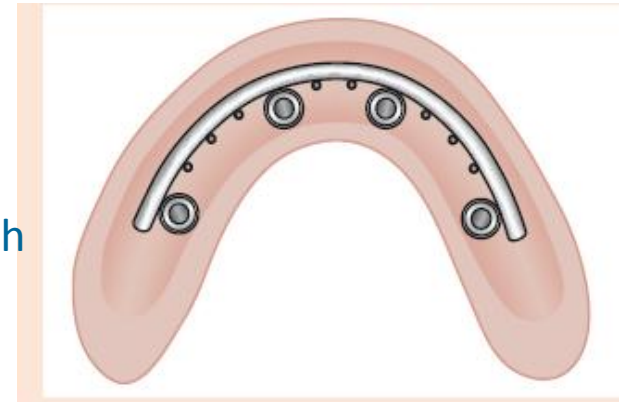
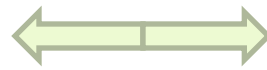
ITS KONE WELD SYSTEM



INTRA ORAL WELDING - SYNCRYSTALLISATION



Titanium wire fused with
abutments



Temporary restorations on implant level

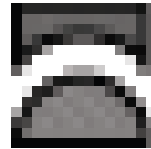


Temporary restorations on
abutment level



Titanium wire

TOOLS – INTRA ORAL WELDING(USTOMED)



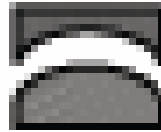
TIP CROSS SECTION



Sharp Curver

bends the bar into more acute angles
for single abutments.

TOOLS – INTRA ORAL WELDING(USTOMED)



TIP CROSS SECTION



Soft Curver

bends the titanium bar along the curve of the arch.

TOOLS – INTRA ORAL WELDING(USTOMED)



TIP CROSS SECTION



Holder

grasps and holds the titanium bar firmly in place during the welding process.

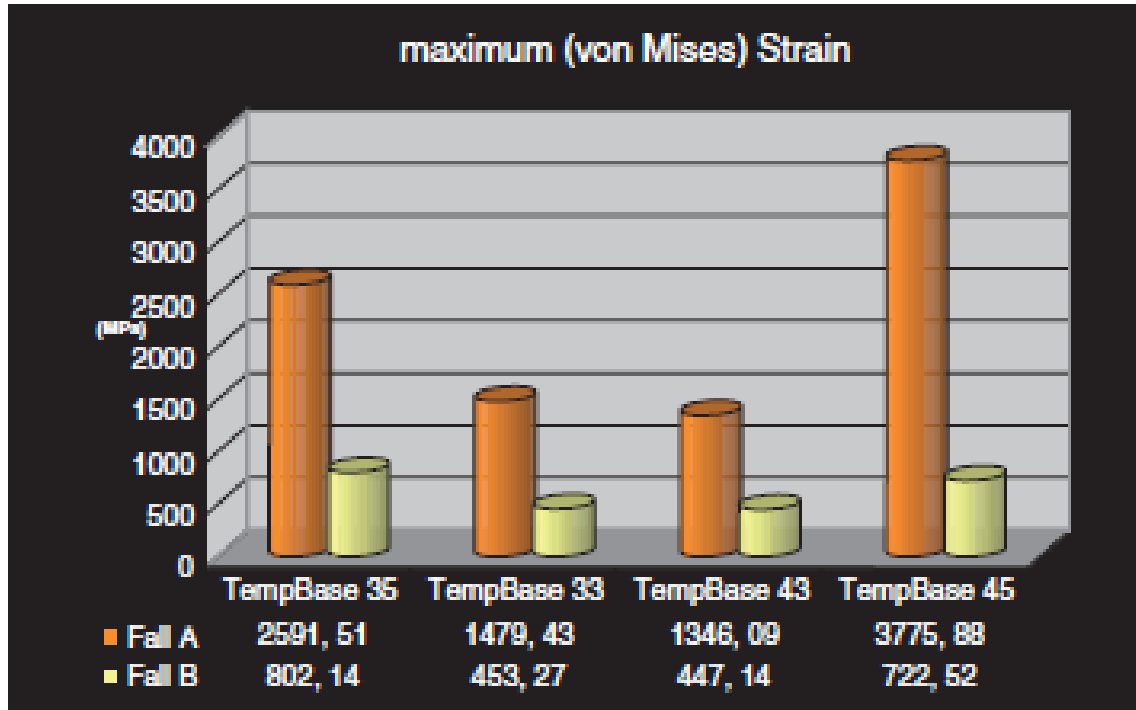
TOOLS – INTRA ORAL WELDING(USTOMED)



Cutter with tungsten carbide inserts easily and efficiently cuts off excess material.

3- Dimension Finite Element Model in edentulous mandible

Marco Degidi, Peter Gehkre ,Andre Spanel etal



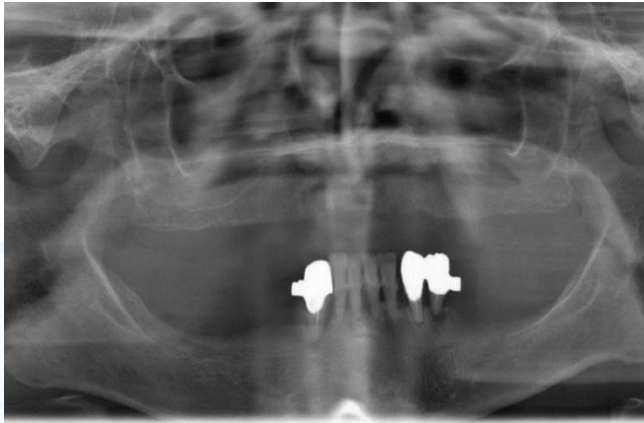
(A) Nonmetal reinforced. (B) Titanium framework reinforced.

Reduction of strain and deformation in Titanium framework reinforced acrylic Resin restoration.

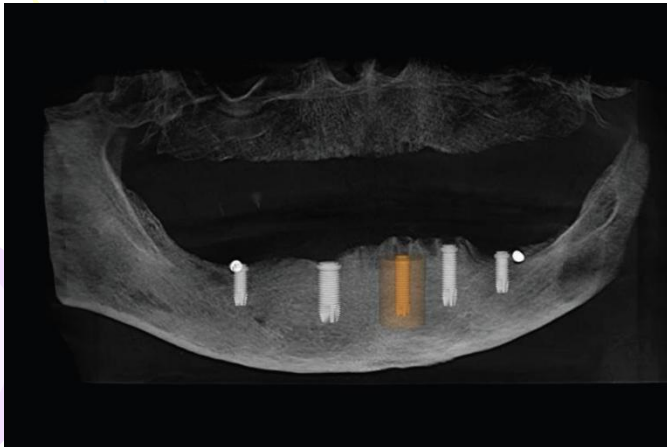
Materials used to reinforce acrylic resin restoration /cross arch stabilization

- ❑ A thin wire or fibers throughout the span
- ❑ A cast metal frame work covering only the facial and lingual surfaces of provisional restoration.
- ❑ Titanium bar.

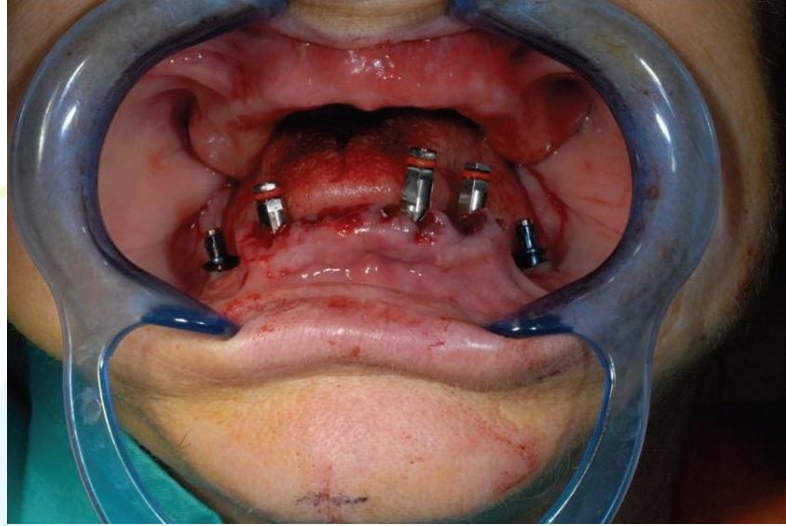
CASE - PRESENTATION



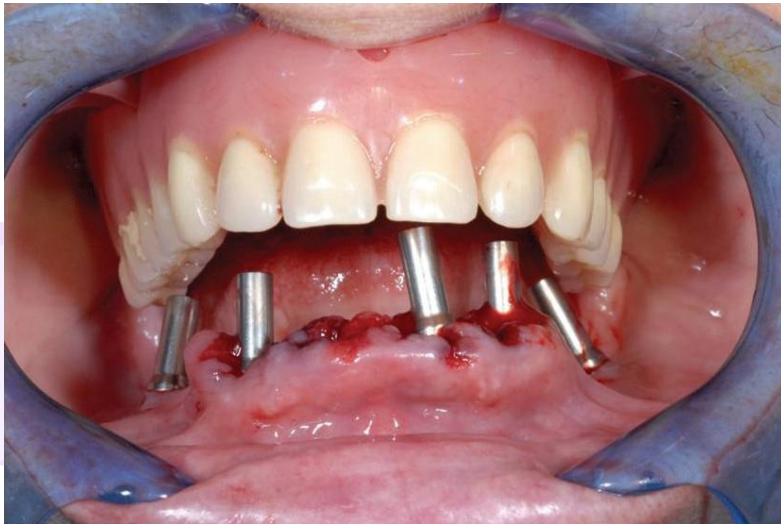
1) PRE-OP OPG



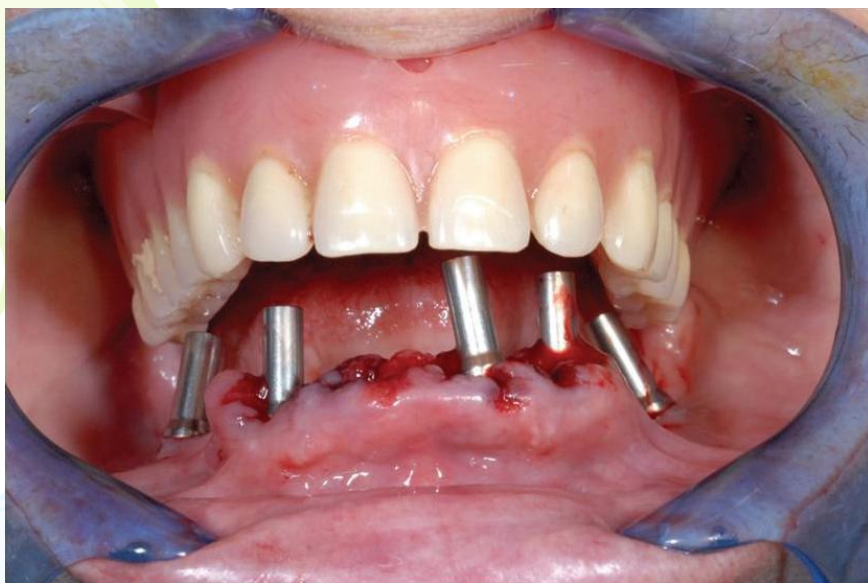
2) COMPUTER GUIDED
IMPLANTS SURGERY



3) IMPLANTS POSITIONED IN MANDIBLE



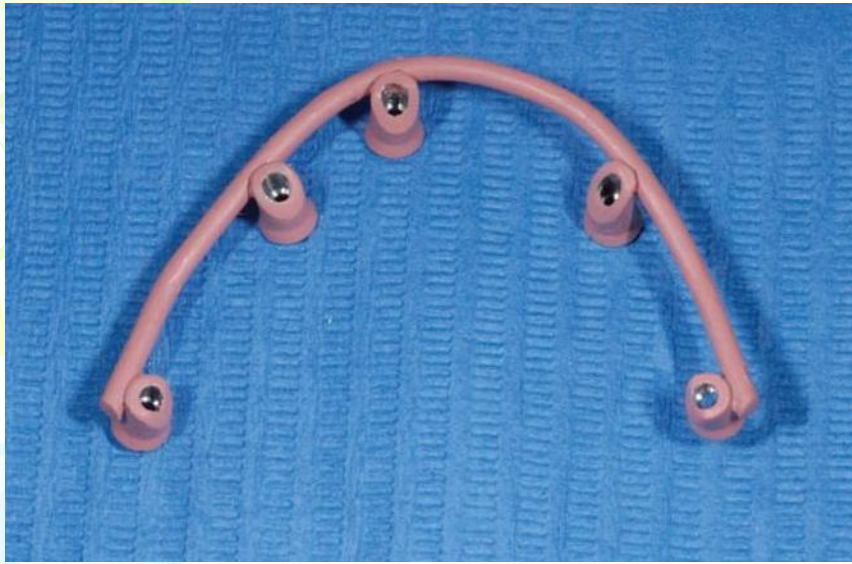
4) ABUTMENTS SCREWED TO IMPLANTS



5) TITANIUM BAR WELDED ON ABUTMENTS



6) TITANIUM FRAMEWORK REMOVED FROM MOUTH.



7) TITANIUM COVERED WITH PINK OPAQUE



8) TITANIUM BAR FIXED TO THE DENTURE WITH ACRYLIC RESIN



9)FINAL PROSTHESIS WITH DRILLING FOR SCREW TIGHTENING.



10) FINAL RESTORATION.



1 Impianto ITS KCL EXTREME conometrico



2 Accoppiamento degli abutment conici ITS 5'



3 Procedure di parallelizzazione



4 Conseguimento del parallelismo intraorale



5 Attivazione delle cappette coniche, per la successiva saldatura



6 Saldatura intraorale



7 Opacizzazione estetica



8 Barra adattata per protesi ribasata



9 Prova di passivazione



10 Rifinitura della protesi



11 Lavoro completato SUP-INF



12 Controllo radiografico Kone Weld System SUP-INF

ITS KONE WELD SYSTEM

