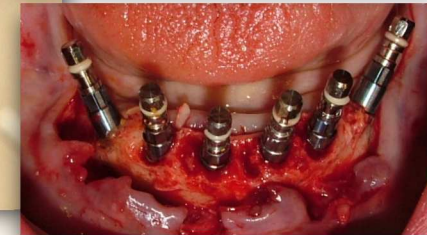
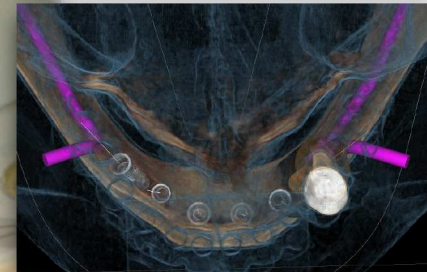
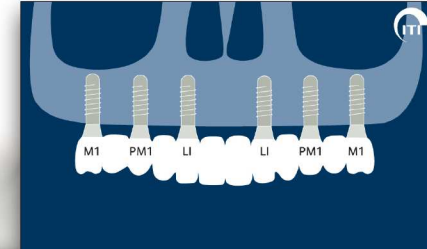


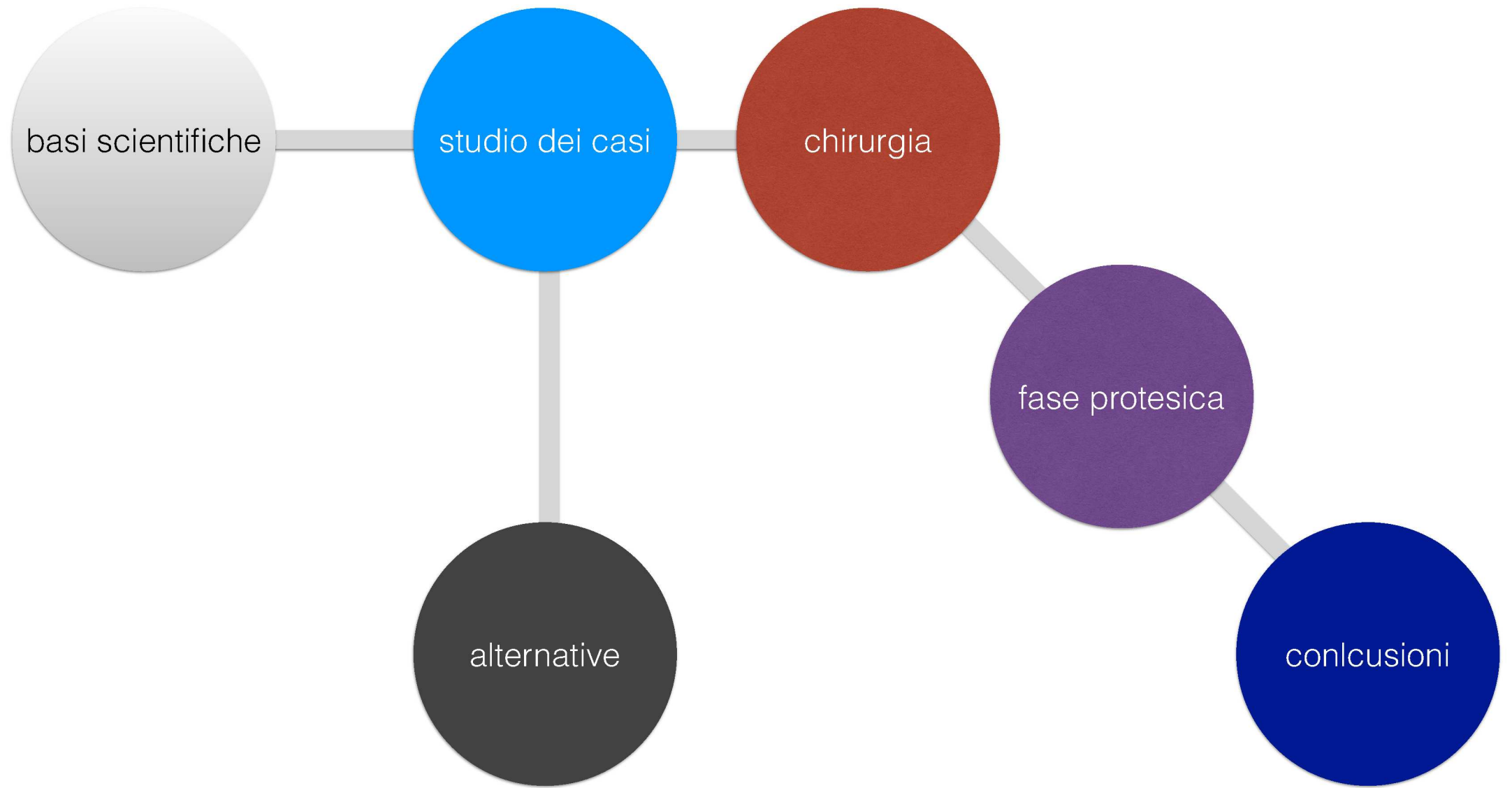


Dr. Massimo Frosecchi

prof. a c. Università di Genova

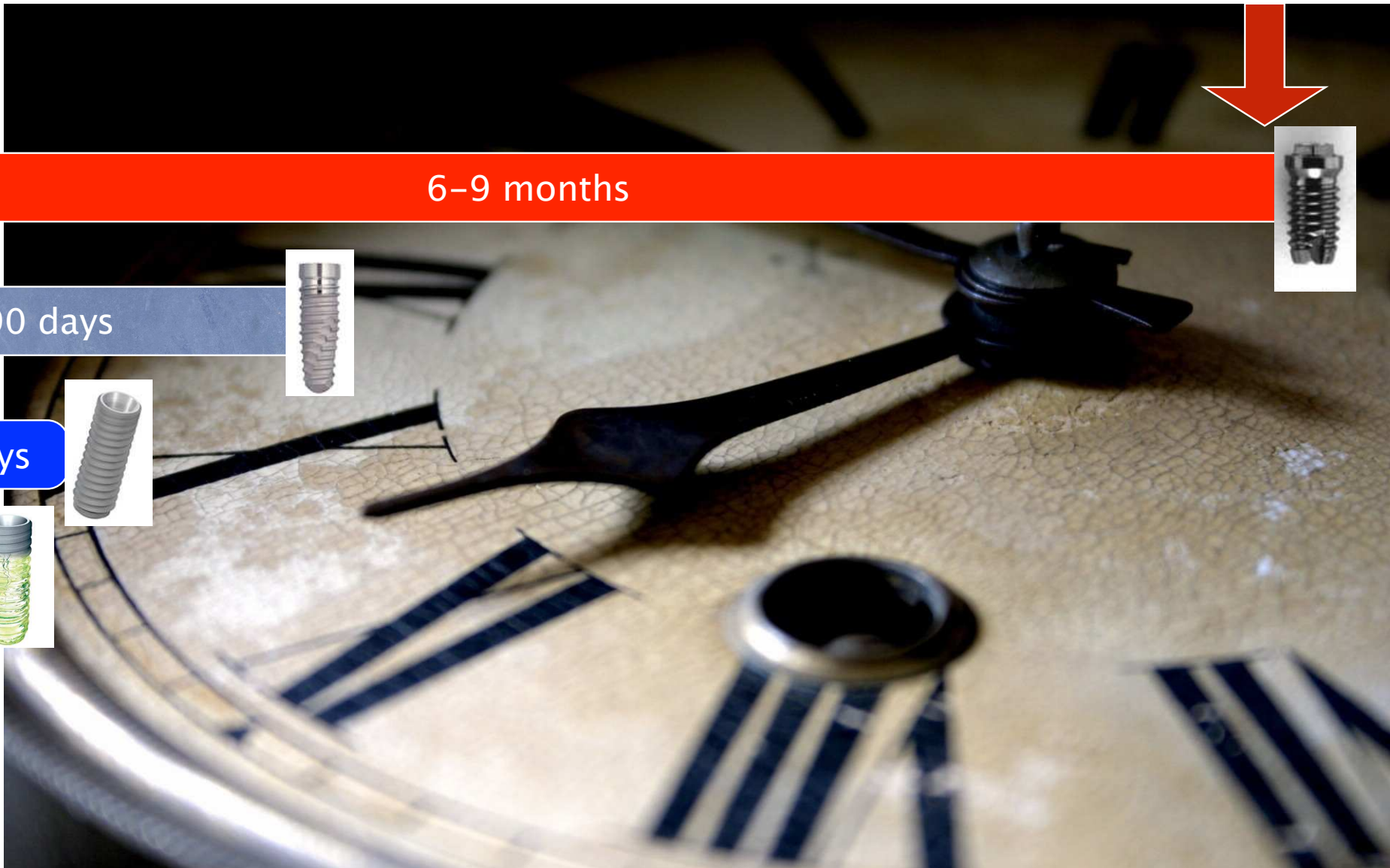
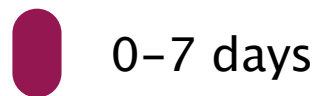
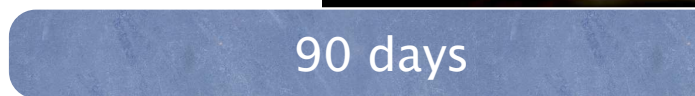
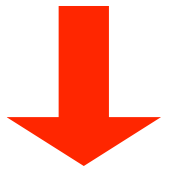


**Protocollo clinico-pratico per il carico immediato in Implantologia**



chirurgia

protesi





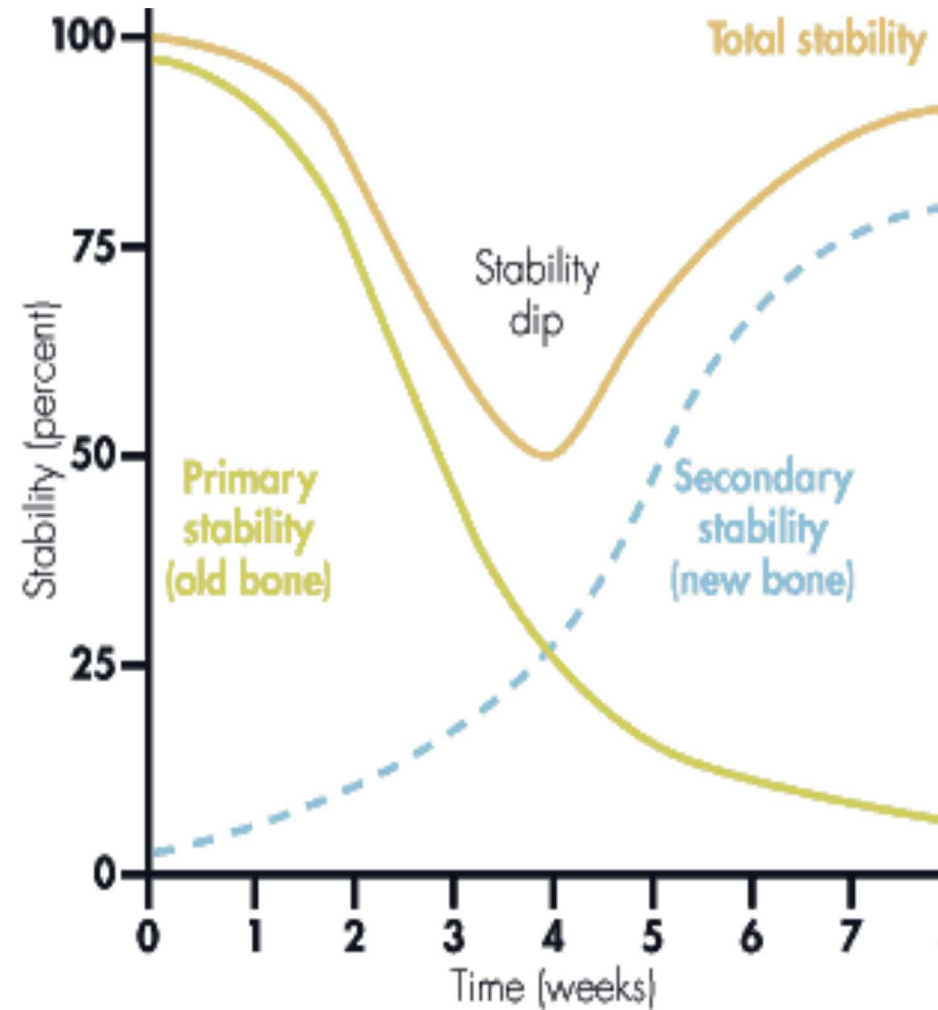
Pubmed - dental implant surface  
osseointegration  
year,count

2013,177  
2012,155  
2011,157  
2010,127  
2009,144  
2008,116  
2007,92  
2006,77  
2005,79  
2004,72  
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1997,53  
1996,50  
1995,26  
1994,17  
1993,29  
1992,26  
1991,19  
1990,16  
1989,7  
1988,2  
1987,1  
1986,2  
1983,1

Lioubavina-Hack N1, Lang NP, Karring T.  
*Clin Oral Implants Res.* 2006 Jun;17(3):244-50.  
**Significance of primary stability for  
osseointegration of dental implants.**

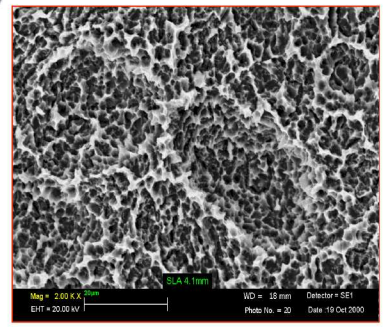
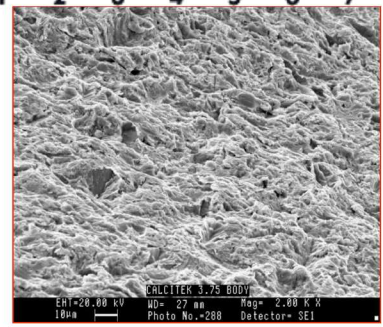
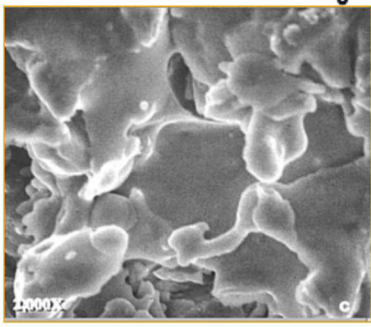
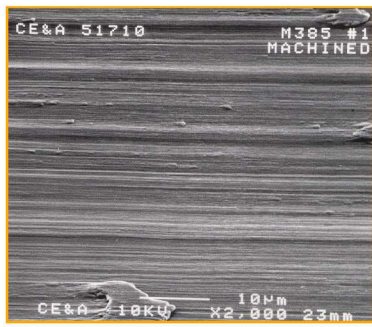
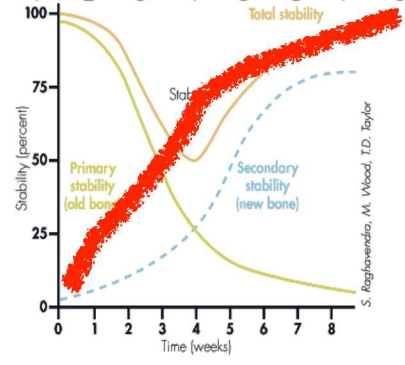
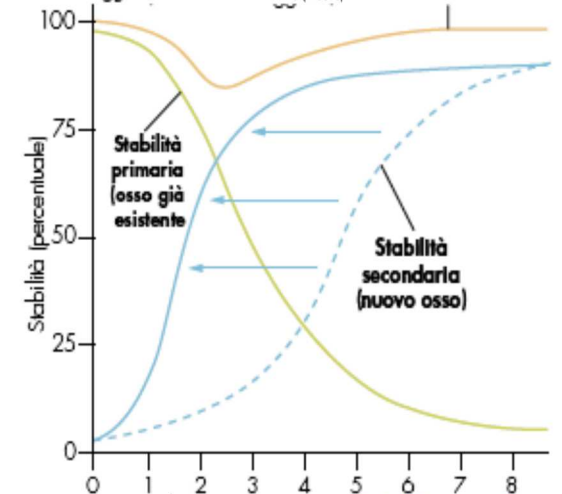
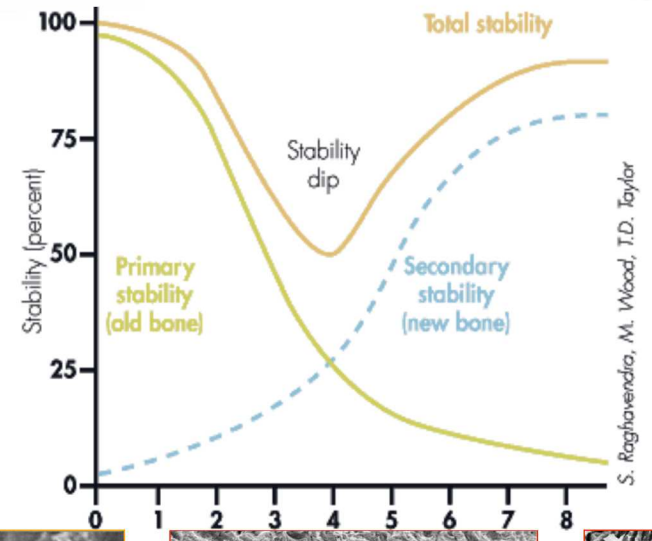
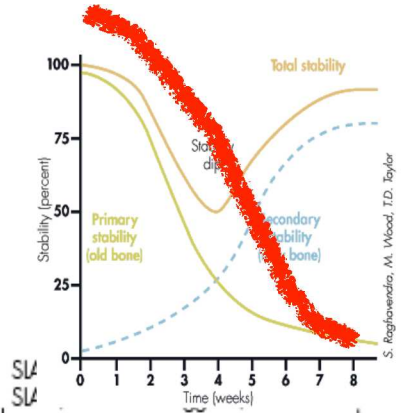
**CONCLUSION:**

The findings of the present study indicate that primary implant stability is a prerequisite for successful osseointegration, and that implant instability results in fibrous encapsulation, thus confirming previously made clinical observations.



S. Raghavendra, M. Wood, T.D. Taylor





# **Carico convenzionale**

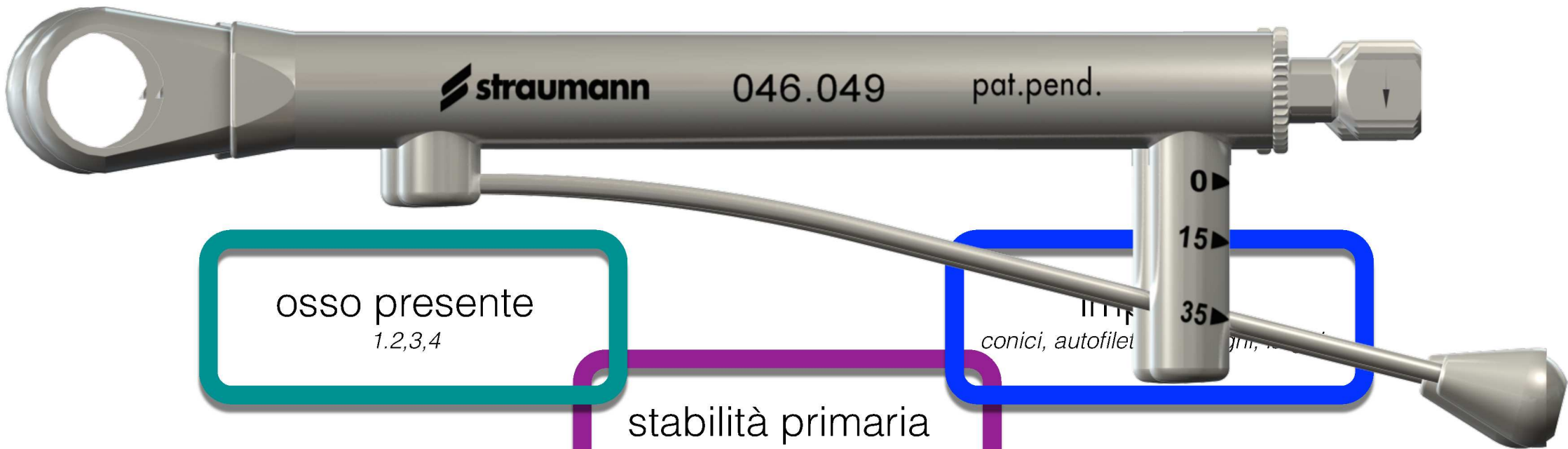
da 3 a 6

# **Carico precoce**

Da 6 a 12 settimane

# **Carico/Restauro immediato**

Entro la prima settimana



osso presente  
1.2,3,4

conici, autofilet  
gn, n

stabilità primaria  
(resistenza ai micro-movimenti)

tecnica  
espansione, accuratezza,  
bicorticalismo

esperienza  
selezione sede, inclinazione,  
bicorticalismo





# Classification of Bone Quality



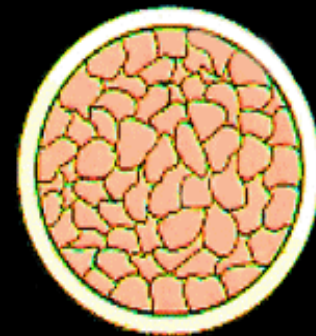
Class I



Class II



Class III



Class IV

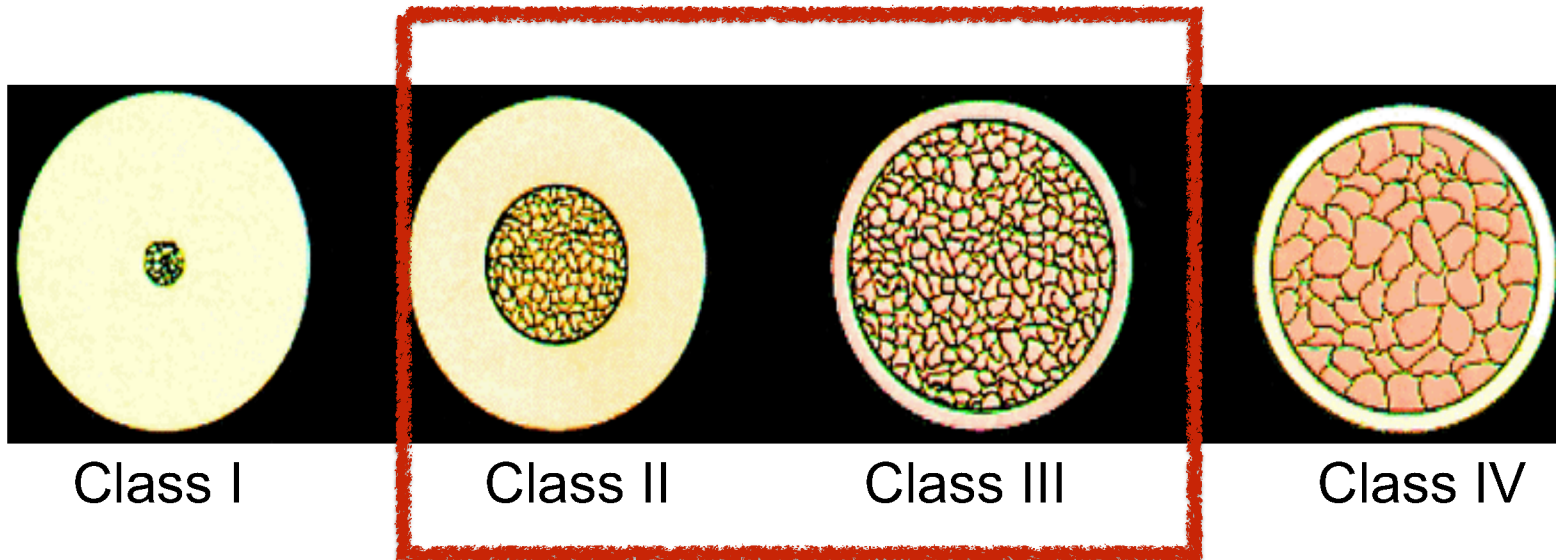
Implant Dent. 2011 Jun;20(3):182-91. doi: 10.1097/ID.0b013e31821662b9.

**Peak insertion torque correlated to histologically and clinically evaluated bone density.**

Makary C1, Rebaudi A, Mokbel N, Naaman N.

**RESULTS:**

D1 and D4 bone types were significantly assessed using tactile sense. IT values ranged from 15 to 150 Ncm with a mean value of 78.30 Ncm. Mean IT was significantly higher in D1 bone (126.67 Ncm) and lower in D4 bone (40.22 Ncm) (P value <0.0001), whereas **intermediate values were noted in D2 and D3 bone with no significant difference between these bone types** (P value = 0.462). Statistically significant correlation was found between bone volume and IT values ( $r = +0.771$ ,  $P < 0.0001$ ). No statistically significant correlation was found between implant length and/or diameter and IT in all bone densities.

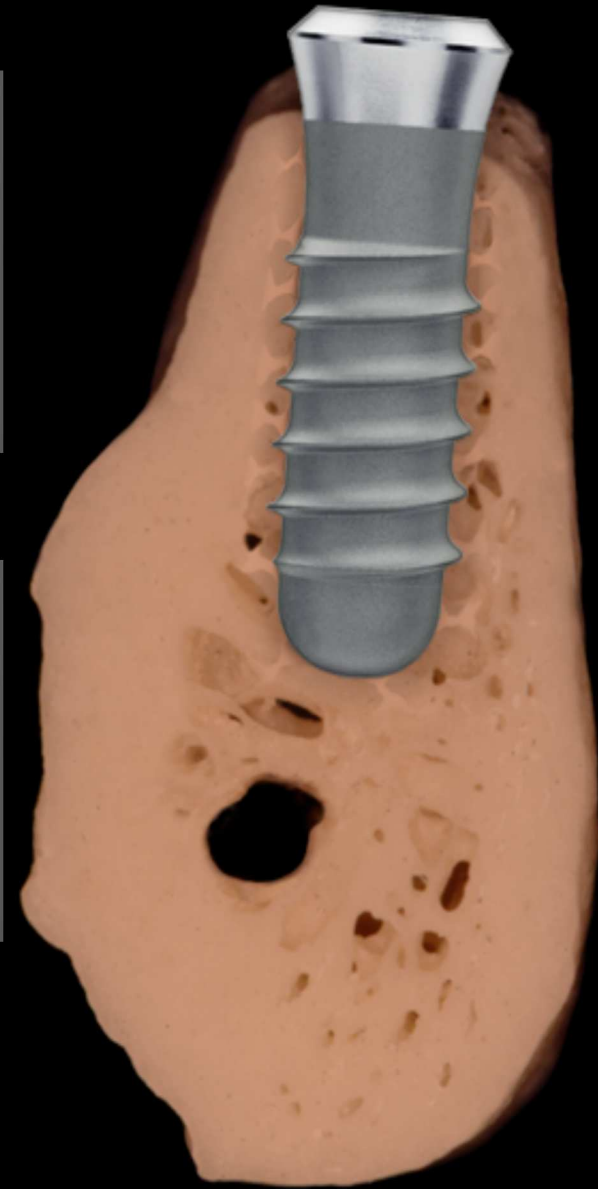


## Osso corticale

- ▶ Non comprimibile
- ▶ Si riassorbe in caso di pressioni eccessive
- ▶ Possibile unico fattore di stabilità primaria
- ▶ Si surriscalda
- ▶ Handle with care!

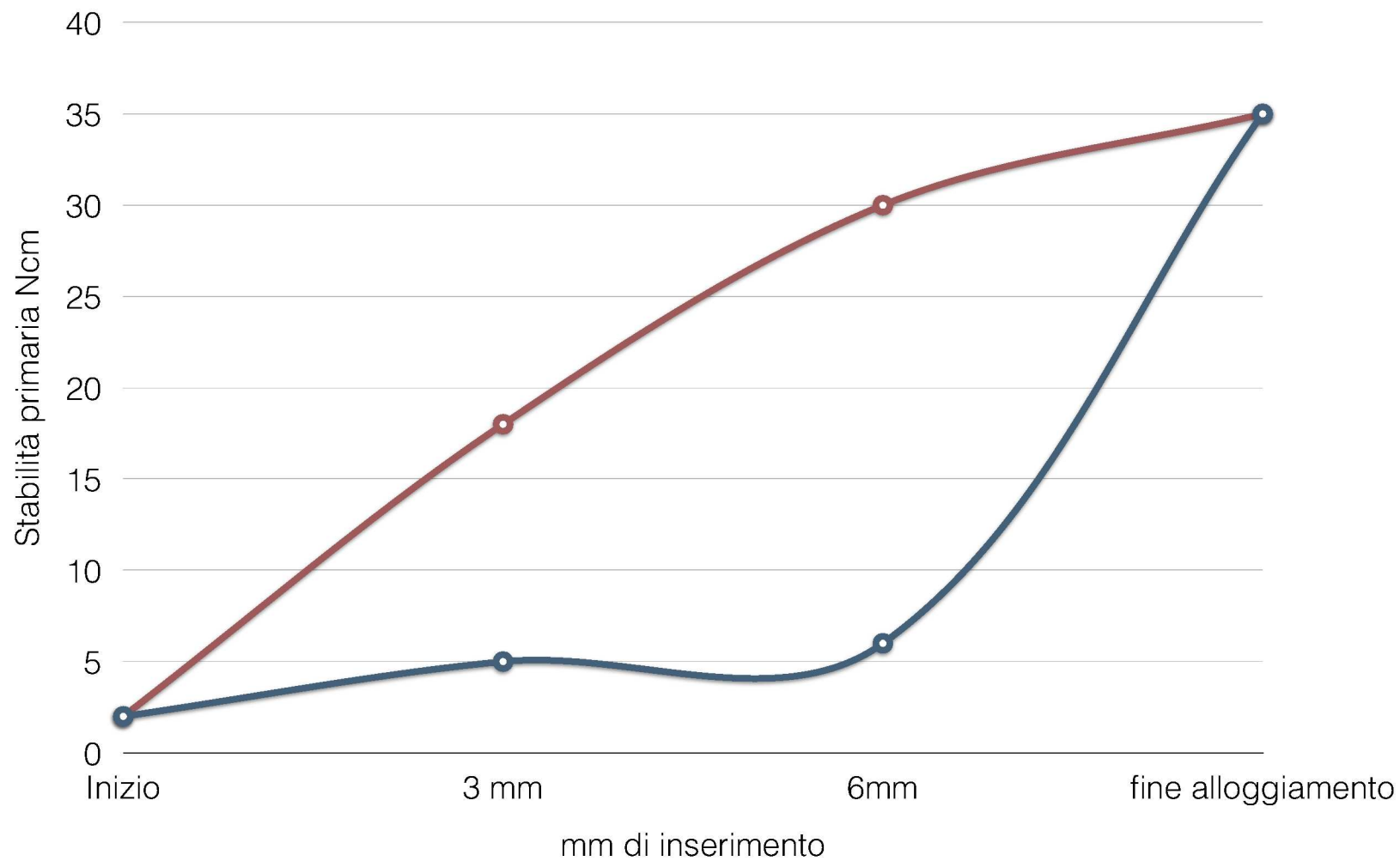
## Osso midollare

- ▶ Comprimibile
- ▶ Reagisce
- ▶ Possibile fattore di stabilità primaria
- ▶ Rischio di distacchi interni e segmentazione



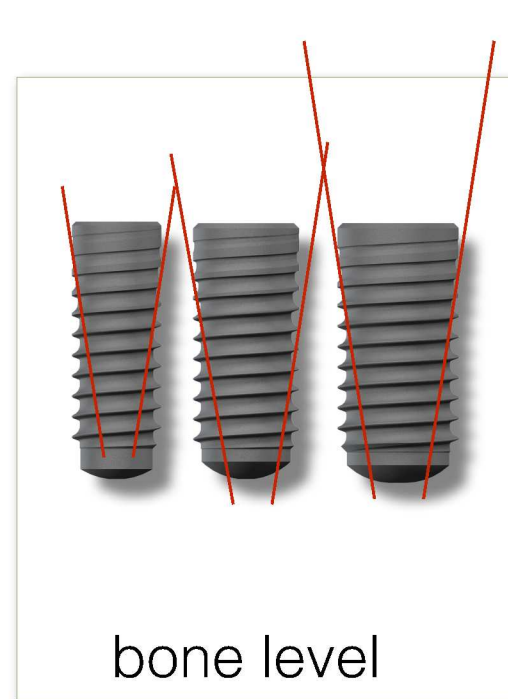
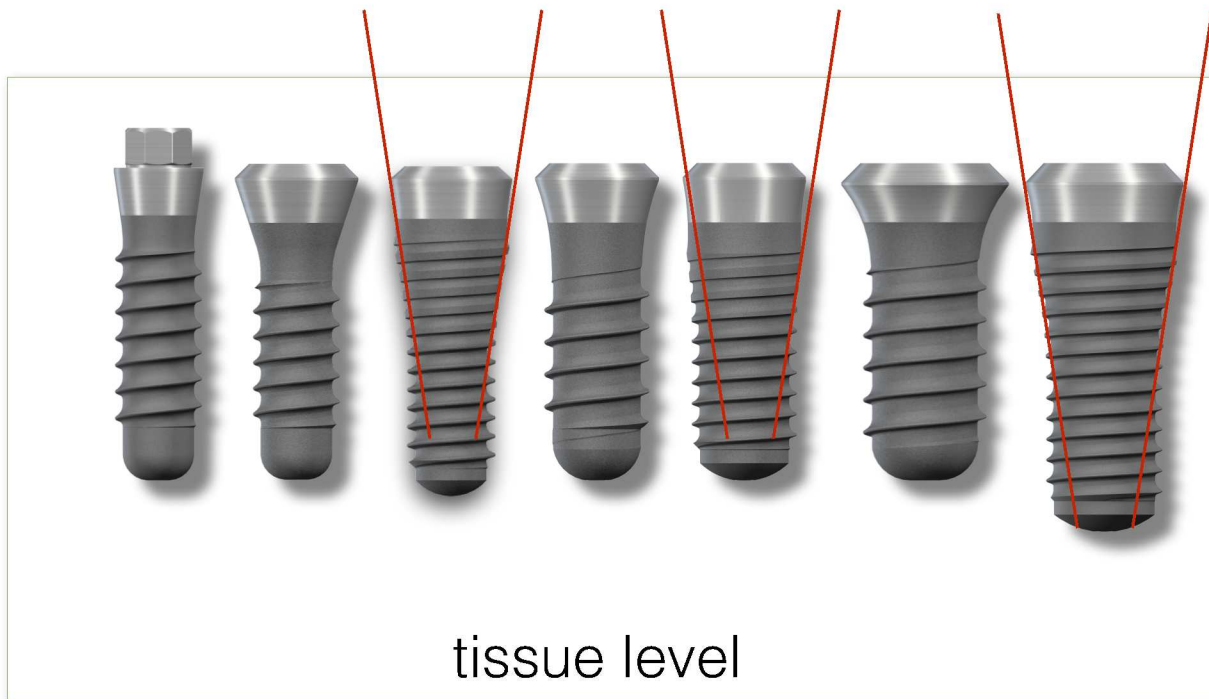


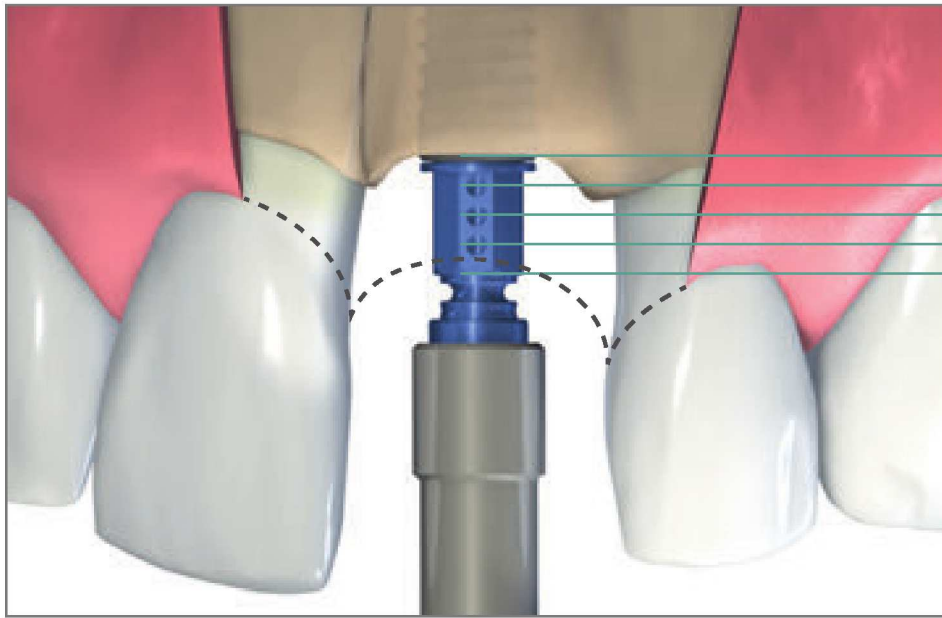
# stabilità primaria “vera” e “falsa”



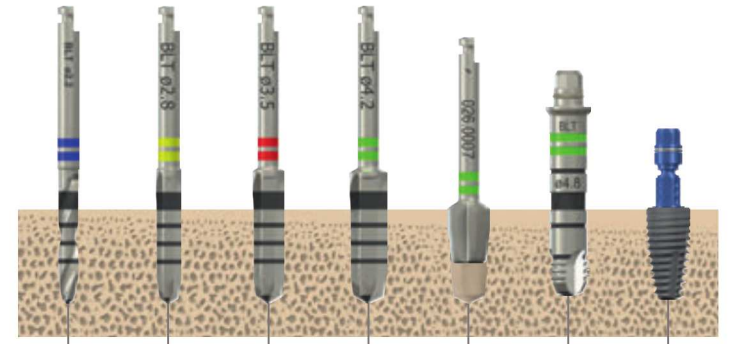
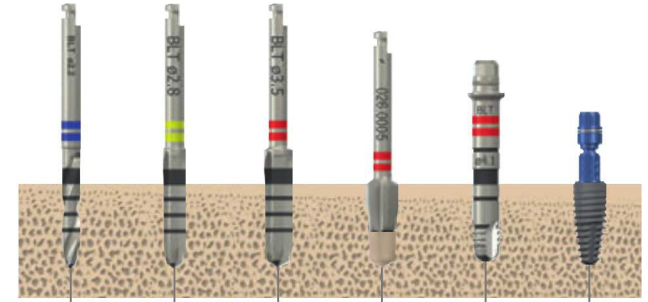
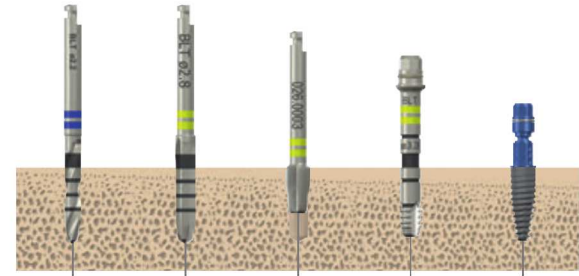
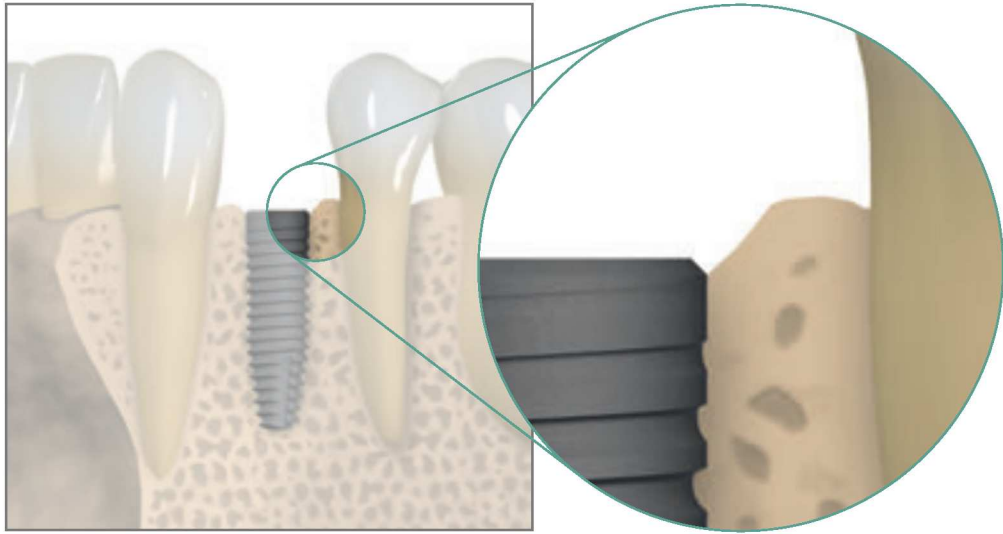
# Impianti e componentistica

possibilità di conseguire elevata stabilità primaria  
possibilmente SLActive, possibilmente Roxolid





- 0 mm (Bone Level)
- 1 mm
- 2 mm
- 3 mm
- 4 mm







## Materiale Roxolid®

- Materiale Roxolid® unico, con eccellenti proprietà meccaniche<sup>38</sup>
- Preserva l'osso e riduce le procedure invasive di innesto osseo<sup>39</sup>
- Maggiori opzioni di trattamento con impianti di dimensioni ridotte
- Maneggevolezza facilitata con la connessione CrossFit®
- Conservazione ottimizzata dell'osso crestale con Bone Control Design™

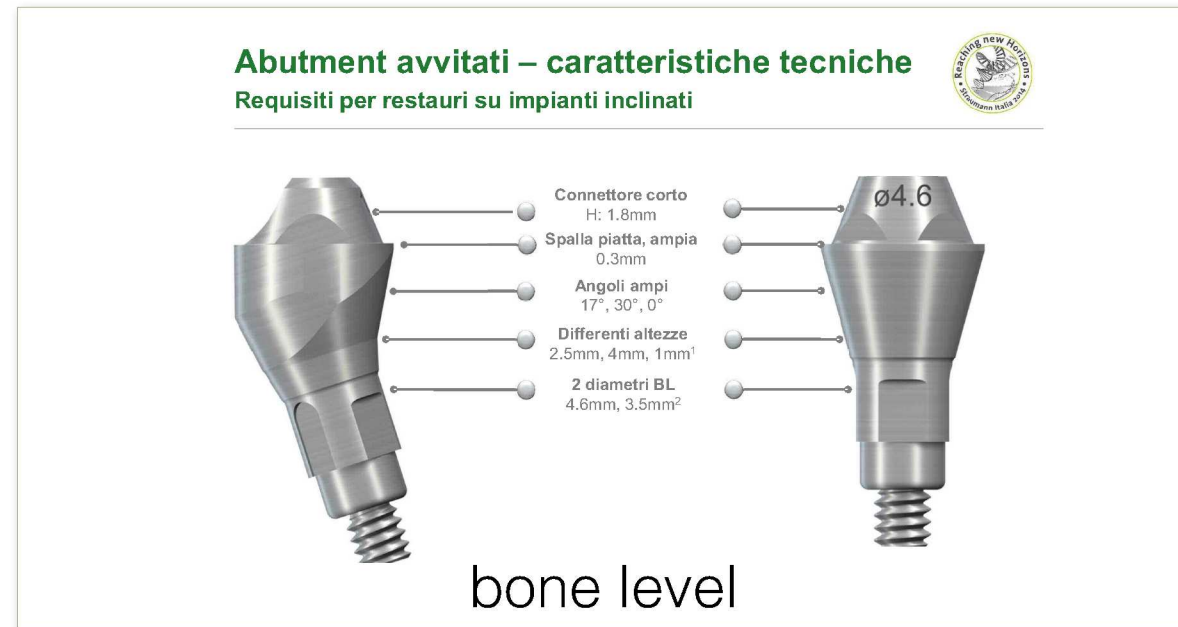
## Superficie SLActive®

- Trattamento più sicuro e più veloce, da 6–8 settimane a 3–4 settimane in tutte le indicazioni<sup>27-35</sup>
- Maggiore predicibilità del trattamento nei protocolli critici<sup>14-20</sup>
- Maggiori possibilità di trattamento anche in pazienti con condizioni di salute compromesse<sup>21-26</sup>



# Impianti e componentistica







abutment privi di index octa o RC o NC  
gestione inclinazioni (evitare componenti interne, abutment appositi)






## CORONE E PONTI

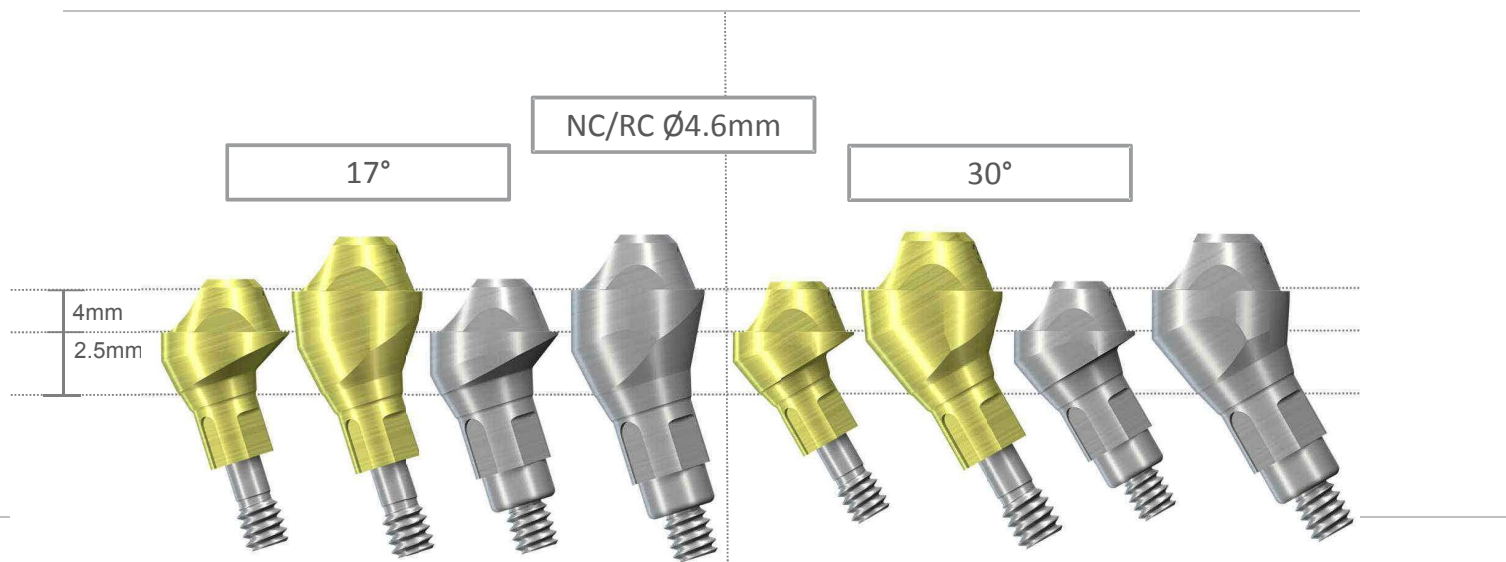
### SISTEMA PROTESICO synOcta® (REGULAR NECK Ø 4,8 mm)

RILEVAMENTO DELL'IMPRONTA E GESTIONE DEI TESSUTI MOLLI

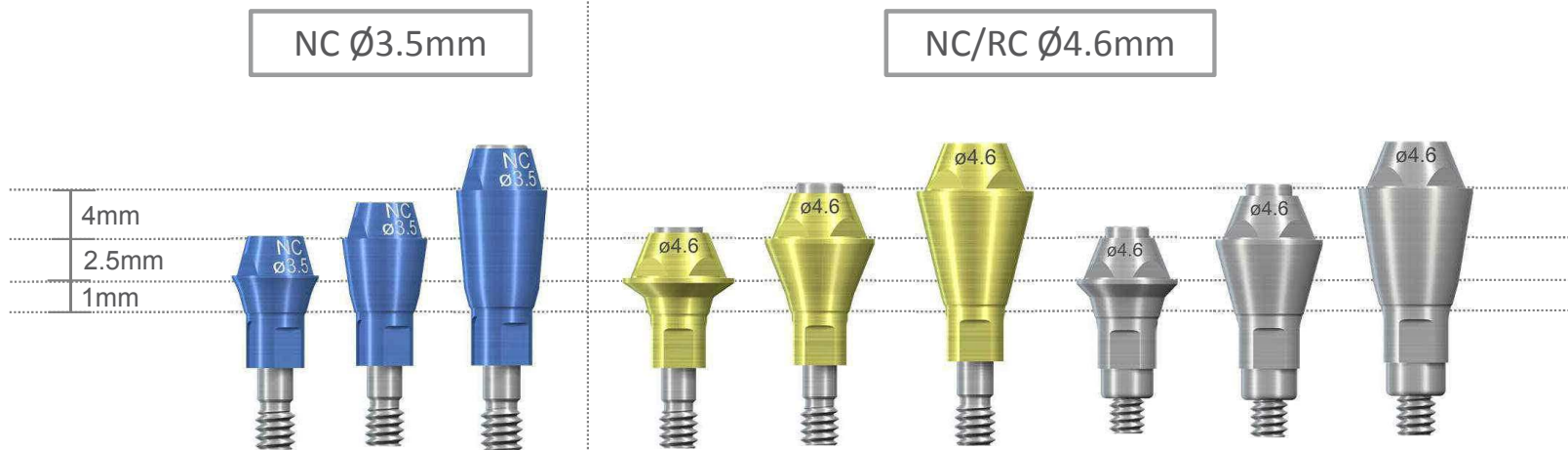
N. articolo		Articolo	Dimensioni	Materiale
048.668		RN synOcta® meso-componente secondaria per provvisorio vite basale inclusa*	Lunghezza 10 mm	PEEK/TAN
048.664		RN Componente secondaria provvisoria VITA CAD-Temp®	Altezza 10 mm, Ø 7 mm	PMMA/TAN
048.356**		synOcta® Vite basale	Lunghezza 6,7 mm	TAN
048.715		RN synOcta® moncone per provvisorio, per corona	Altezza 9 mm	Ti
048.716		RN synOcta® moncone per provvisorio, per ponte	Altezza 9 mm	Ti
049.181		SCS Vite occlusale lunga, per l'avvitamento di guaine di guida su componentesecondaria Octa, synOcta® o conica da 15°	Lunghezza 7,6 mm	TAN

#### Ricostruzione provvisoria

024.4372		RC Componente secondaria provvisoria VITA CAD-Temp®	Altezza 12 mm, Ø 7 mm	PMMA/TAN
024.4371		RC Componente secondaria provvisoria per corona	Altezza 11 mm, Ø 4,5 mm	TAN
024.4375		RC Componente secondaria provvisoria per ponte	Altezza 11 mm, Ø 4,5 mm	TAN



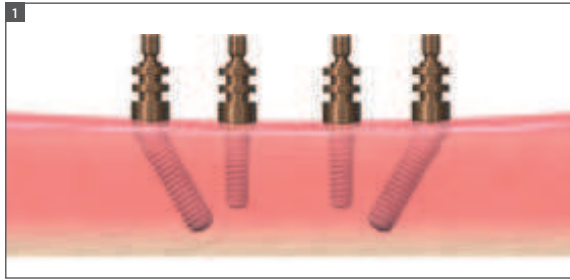
Viti (incluse negli abutments e cappette)



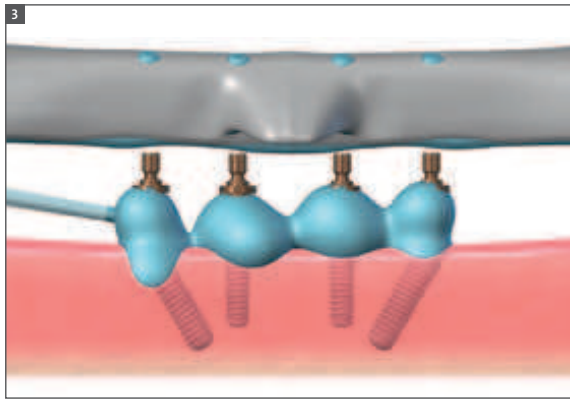
Viti (incluse negli abutments e cappette)



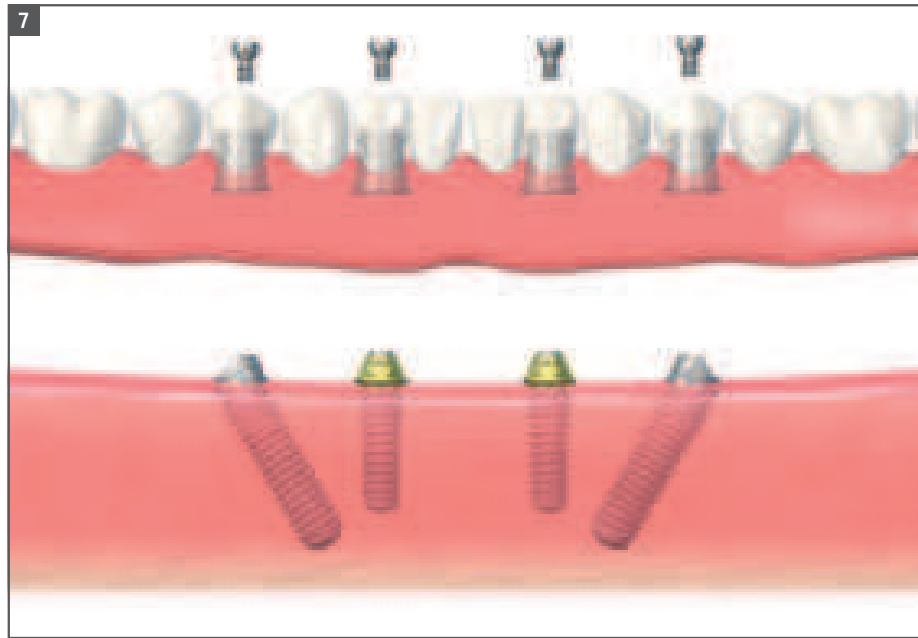
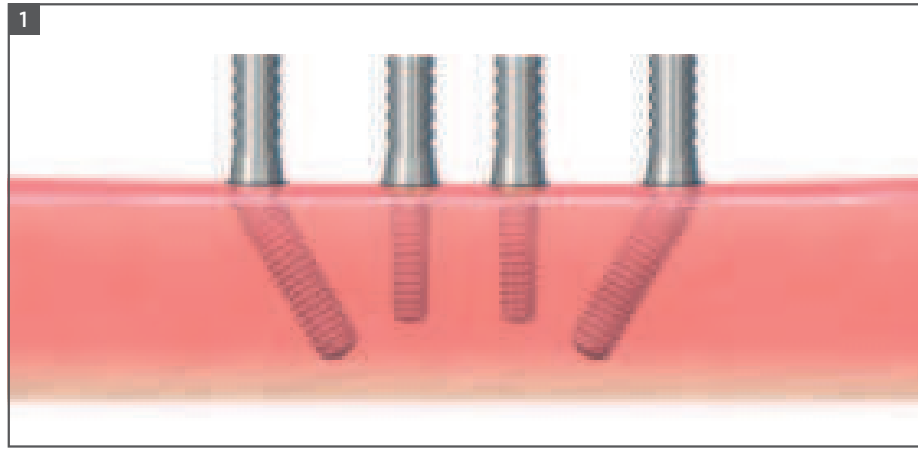
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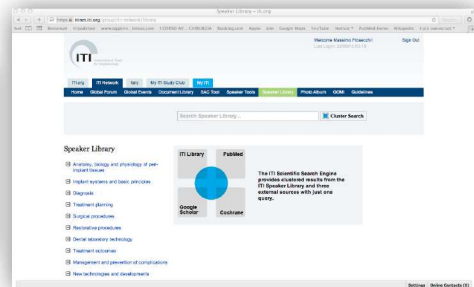


to  
e-





TI Ø 3.3 mm BN		• Per indicazioni di impianti endosteici nella arcata superiore e inferiore per rimpiazzare funzionalmente ed esteticamente i pazienti edentoli e parzialmente edentoli	7 mm	7 mm
TI Ø 4.1 mm BN		• Come alternativa in caso di spazi con affollamento riducente nei denti contigui, che contrastano una conduzione per gli impianti con diametro endosteico maggiore	7 mm	7 mm
TI Ø 4.8 mm WN		• Per indicazioni di impianti endosteici nella arcata superiore e inferiore, per rimpiazzare funzionalmente ed esteticamente i pazienti edentoli e parzialmente edentoli • Per impianti TI Ø 4.8 mm negli spazi particolarmente indicati per carico e spazi interdentali più stretti	8.5 mm	8.5 mm

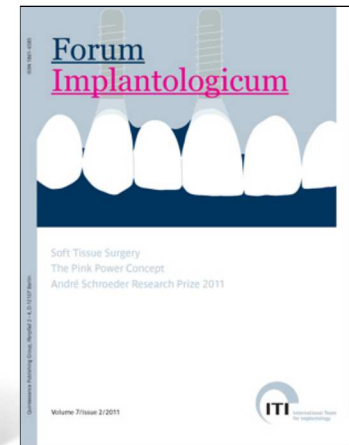


manuali

web site



ITI treatment guides



review

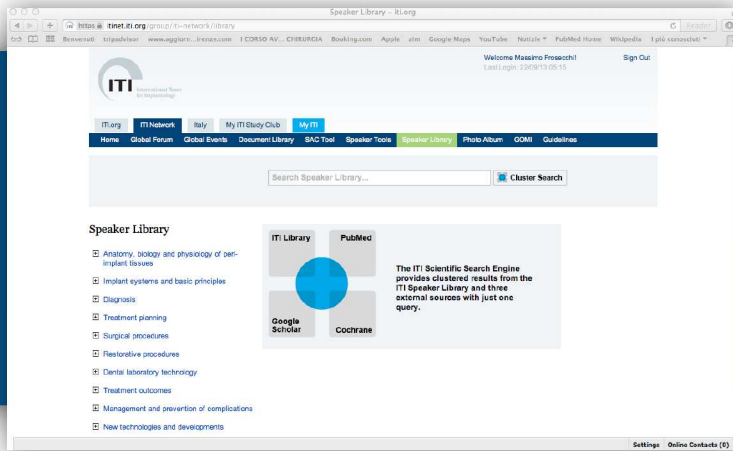


study clubs, congresses



Table 5 SAC classification for loading protocols and prosthodontic difficulty level in edentulous patients.

	Removable				Fixed			
	Maxilla		Mandible		Maxilla		Mandible	
	4 implants	≥6 implants	2 implants	≥4 implants	<6 implants	≥6 implants	<6 implants	≥6 implants
<b>Conventional loading</b>	Advanced	Advanced	Straight-forward	Advanced	Advanced	Complex	Advanced	Advanced
<b>Early loading</b>	Complex	Complex	Straight-forward	Advanced	Advanced	Complex	Advanced	Complex
<b>Immediate loading</b>	Not recommended		Advanced	Complex	Complex	Complex	Complex	Complex



Focused Question: **Is there a difference in the survival or success rate between fixed and removable solutions for the edentulous maxilla/mandible?**

In the mandible, similar implant survival/success rates were found for fixed and removable reconstructions. In the maxilla, implants for overdenture treatment had higher failure rates than those supporting fixed reconstructions.

The literature provides a **low level of evidence on this topic**. Randomized controlled clinical trials with large sample size including prosthetic parameters are needed to verify the current conclusion.

	5 Years	10 Years	15 Years
<b>Maxilla Fixed</b>	88%	81%	70%
<b>Maxilla Removable</b>	77%		
<b>Mandible Fixed</b>	97%	91%	82%
<b>Mandible Removable</b>	96%	95%	

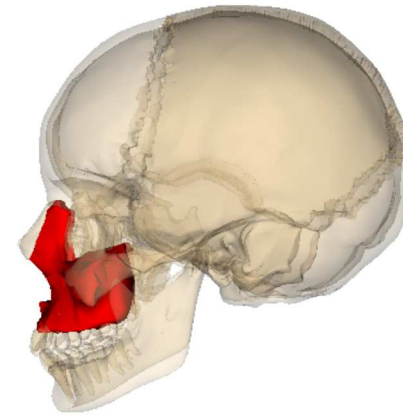
© 2010 ITI International Team for Implantology

Implant survival rates in relation to the prosthesis type, jaw and time.



	Full-Arch Bridge (8 Implants)	Milled Bar (6 Implants)	Dolder Bar (4 Implants)
Cumulative Implant Success Rate	92.1%	92.2%	86.9%
Actual 5-Year Implant Success Rate	95.3%	94.4%	88.9%
Prostheses Survival Rate	96.4%	94.7%	87.5%

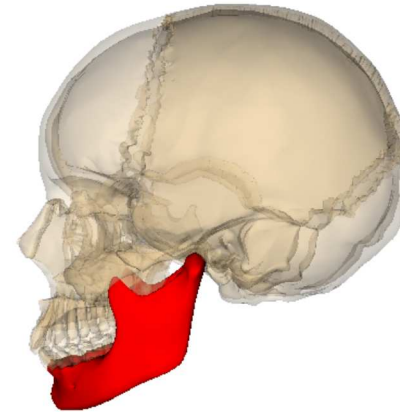
© 2010 ITI International Team for Implantology



Implant success rate in relation to the prosthesis type in the maxilla, and the prosthesis survival rate.

	Full-Arch Bridge (8 Implants)	Dolder Bar (4 Implants)	Ball Anchors (2 Implants)
Cumulative Implant Success Rate	96.2%	93.7%	93.9%
Actual 5-Year Implant Success Rate	96.4%	95.8%	94.7%
Prostheses Survival Rate	100%	98.8%	97.7%

© 2010 ITI International Team for Implantology



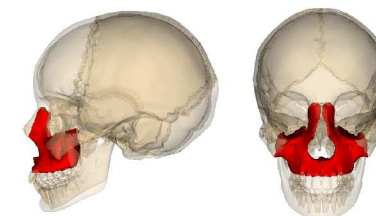
Implant success rate in relation to the prosthesis type in the mandible, and the prosthesis survival rate.



Table 2 Indications for loading protocols with maxillary fixed rehabilitations

Implant/prosthetic design				
Conventional loading	CD	SCV	SCV	SCV
Early loading	CID	CD	CD	CD
Immediate loading	CID	CWD	CWD	CWD
Implant number and distribution	Four anterior	Six anterior	Six anterior-posterior	Eight anterior-posterior
Prosthesis	Full-arch with distal cantilevers	Full-arch with distal cantilevers	Full-arch	Segmented in four three-unit FPDs*
Clinics	Increased interarch space, adequate bone volume in the anterior maxilla	Increased interarch space, adequate bone volume in the anterior maxilla	Increased interarch space, adequate bone volume in the anterior/posterior maxilla	Increased interarch space, adequate bone volume in the anterior/posterior maxilla

SCV: scientifically and clinically validated – dark green  
 CWD: clinically well documented – light green  
 CD: clinically documented – yellow  
 CID: clinically insufficiently documented – red  
 M1: first molar, PM 2: second premolar, PM1: first premolar, C: canine, CI: central incisor, LI: lateral incisor  
 \*The segmentation design represents the final prosthesis. For fixed transitional prosthesis a full-arch on-eyecup is indicated.  
 ←: Cantilever  
 →→: Segmentation area



Cochrane Database Syst Rev. 2009 Jan 21;(1):CD003878.

## Interventions for replacing missing teeth: different times for loading dental implants.

Esposito M, Grusovin MG, Achille H, Coulthard P, Worthington HV.



### AUTHORS' CONCLUSIONS:

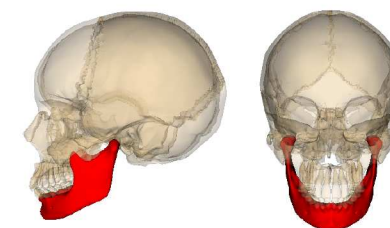
It is possible to successfully load dental implants immediately or early after their placement in selected patients, though not all clinicians may achieve optimal results. It is unclear whether it is beneficial to avoid occlusal contacts during the osseointegration phase. Trends suggest that **immediately loaded implants fail more often than those conventionally loaded, but less commonly than those loaded early**. If a clinician wishes to load the implants early, it might be wiser to load them immediately (within 1 week) rather than waiting for 1 or 2 months. **A high degree of primary implant stability (high value of insertion torque) seems to be one of the prerequisites for a successful immediate/early loading procedure.**



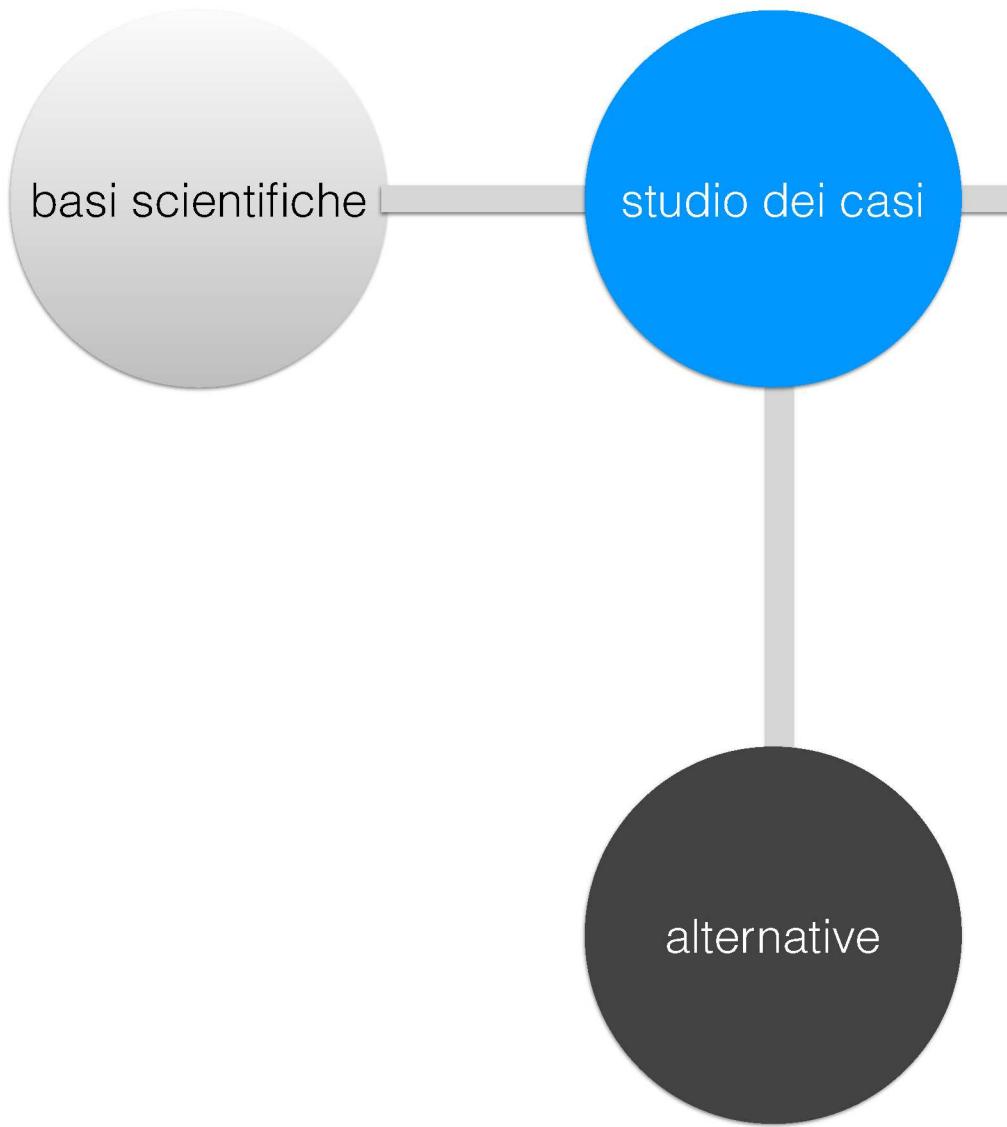
Implant/prosthetic design				
Conventional loading	CWD	SCV	SCV	SCV
Early loading	CD	CD	CD	CD
Immediate loading	CD	CWD	CWD	CWD
Implant number and distribution	Four anterior	Six anterior	Six anterior-posterior	Six anterior-posterior
Prosthesis	Full-arch with one-unit bilateral distal cantilevers	Full-arch with two-unit bilateral distal cantilevers	Full-arch in one piece	Segmented into three FPDs*
Clinics	Increased interarch space, adequate bone volume in the anterior mandible	Increased interarch space, adequate bone volume in the anterior mandible	Increased interarch space, adequate bone volume in the anterior/posterior mandible	Increased interarch space, adequate bone volume in the anterior/posterior mandible

SCV: scientifically and clinically validated – dark green  
 CWD: clinically well documented – light green  
 CD: clinically documented – yellow  
 M1: first molar PM1: first premolar, C: canine, Lt: lateral incisor  
 ---: Segmentation area

\*The segmentation design represents the final prosthesis. For fixed transitional prosthesis, a full-arch one-piece prosthesis is indicated.



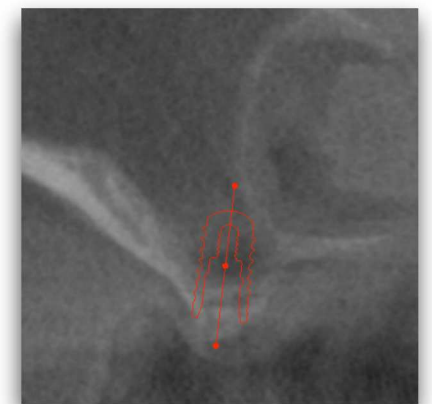




Selezione del Paziente

Cavo orale/elementi  
dentari

Studio del sito



# Iter di selezione e progettazione

- Colloquio col paziente: aspettative, compliance, elementi specifici
- Raccolta dati anamnestici
- Esame obiettivo extr-orale e intra-orale (comprese protesi eventuali)
- Radiografia panoramica e modelli di studio
- Elaborazione di dima radiologica
- CBCT con dima radiologica
- Chirurgia guidata o chirurgia convenzionale
- Fase chirurgica protesicamente guidata

procedure  
evidence  
based

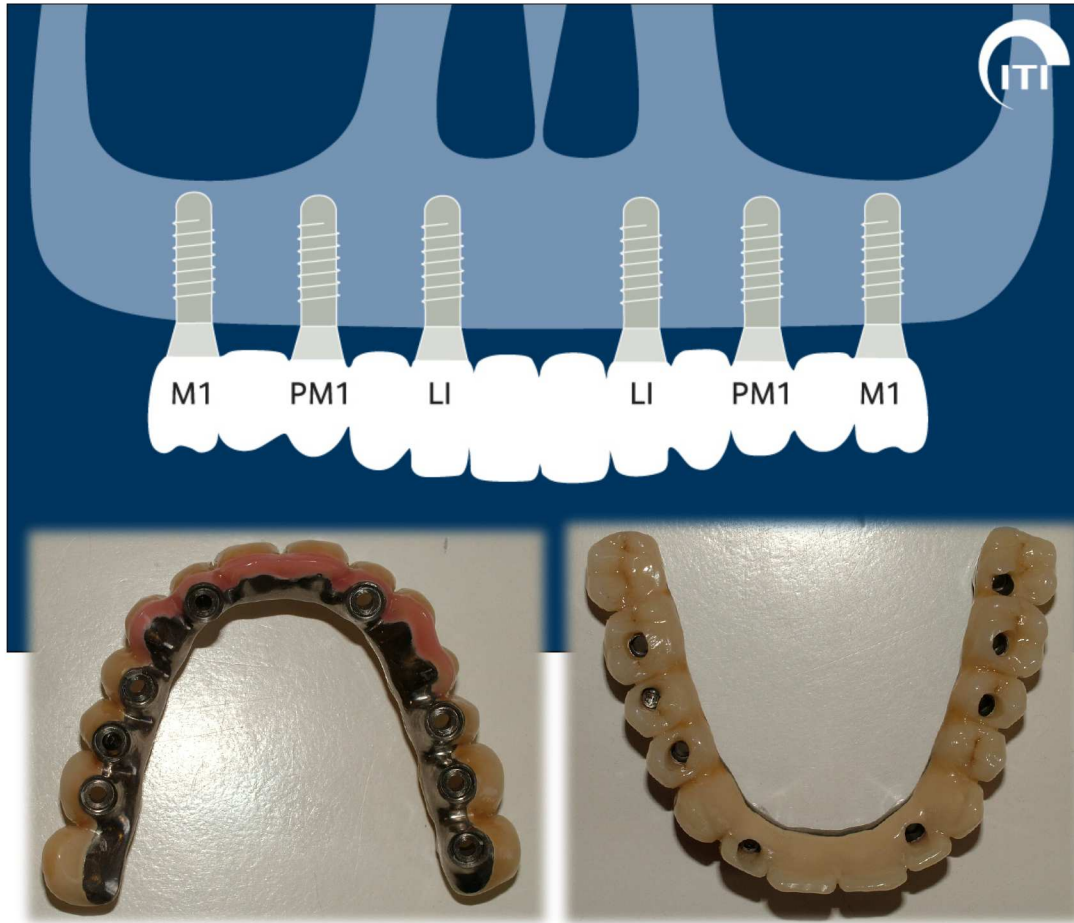
esperienze  
studio

aspettative,  
compliance,  
desiderio

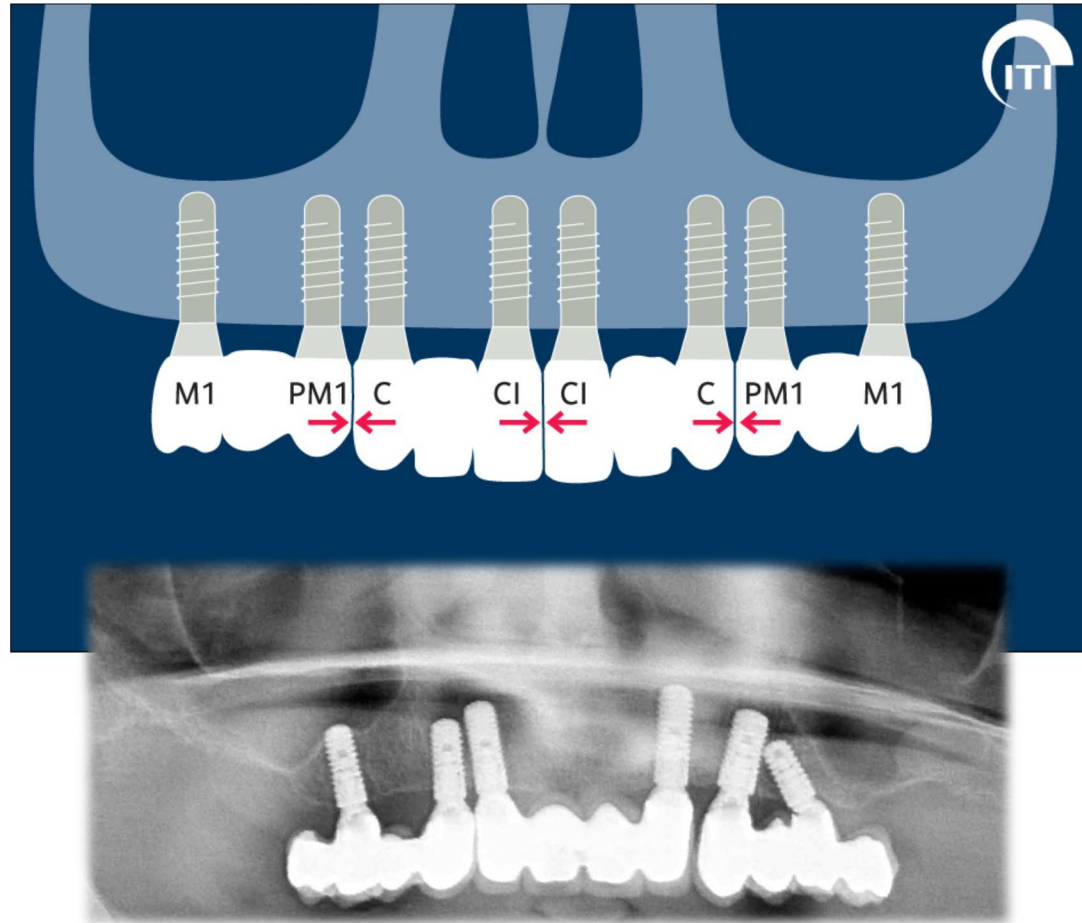


# Unire o separare

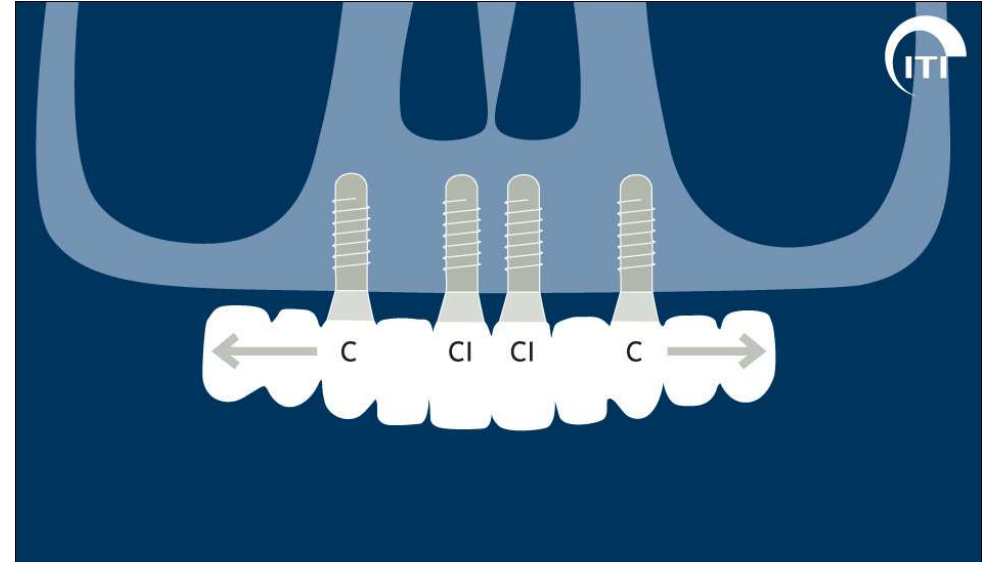
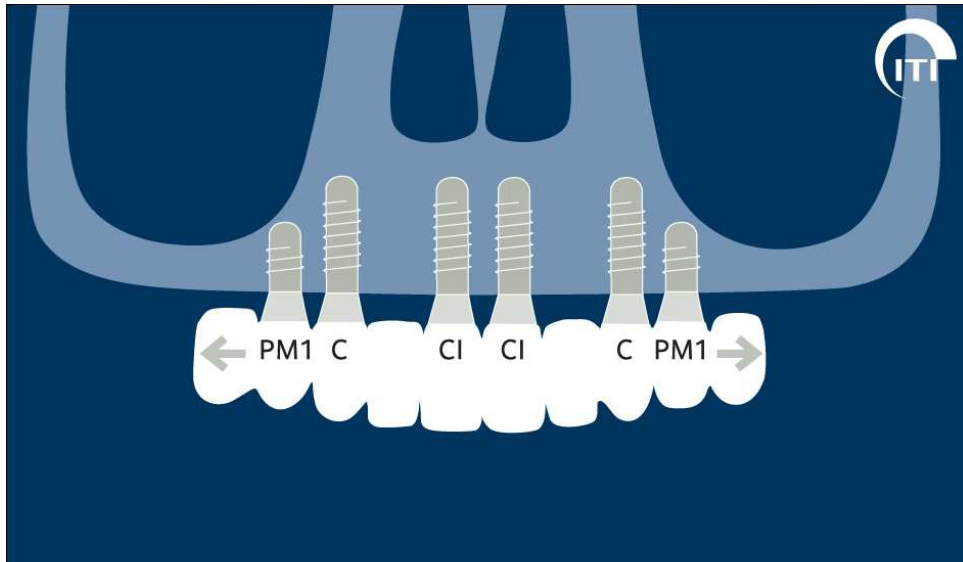
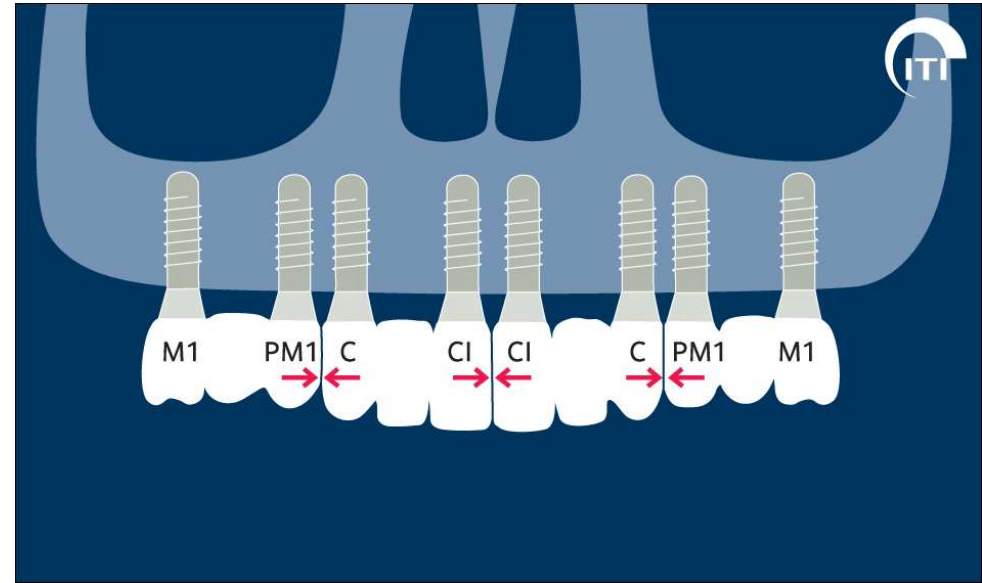
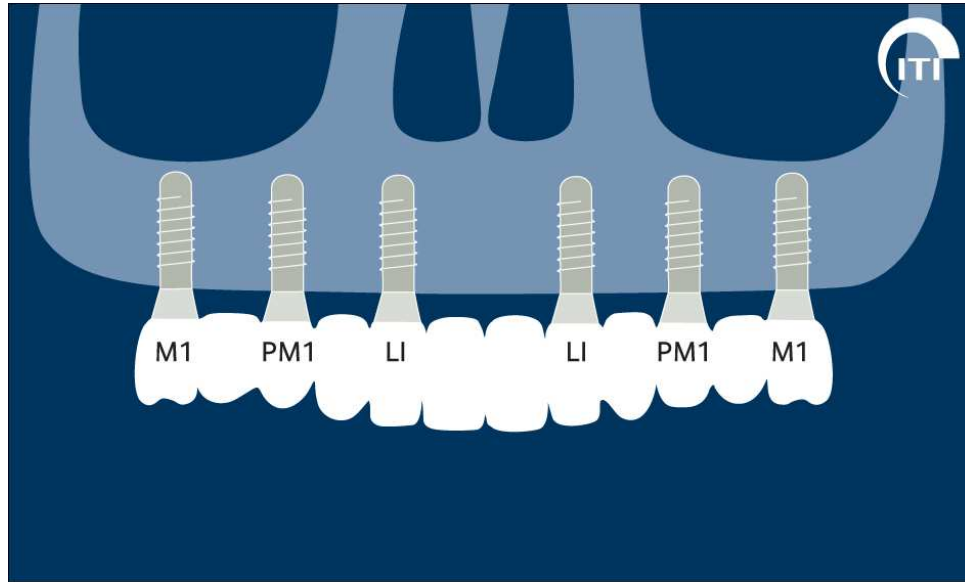
- **Necessità di unire**
- **Tecniche protesiche di alta precisione**
- **Protesi avvitata**

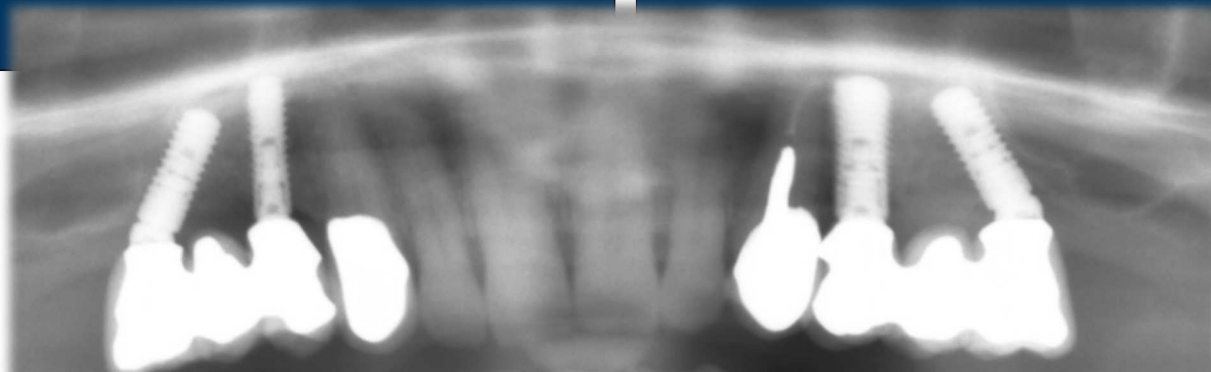
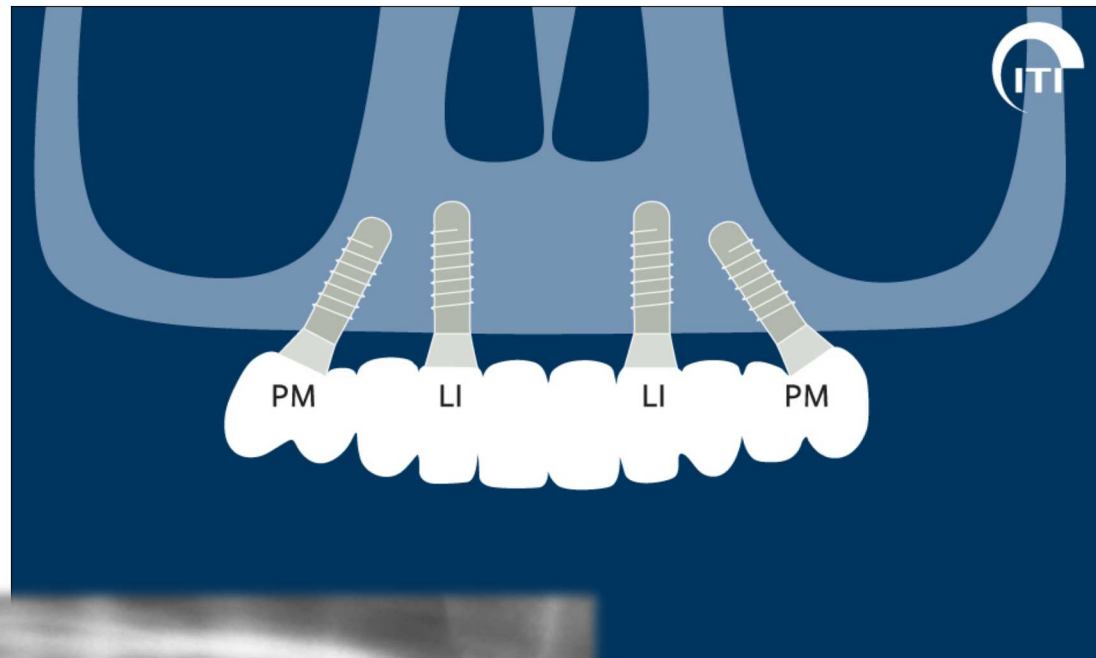
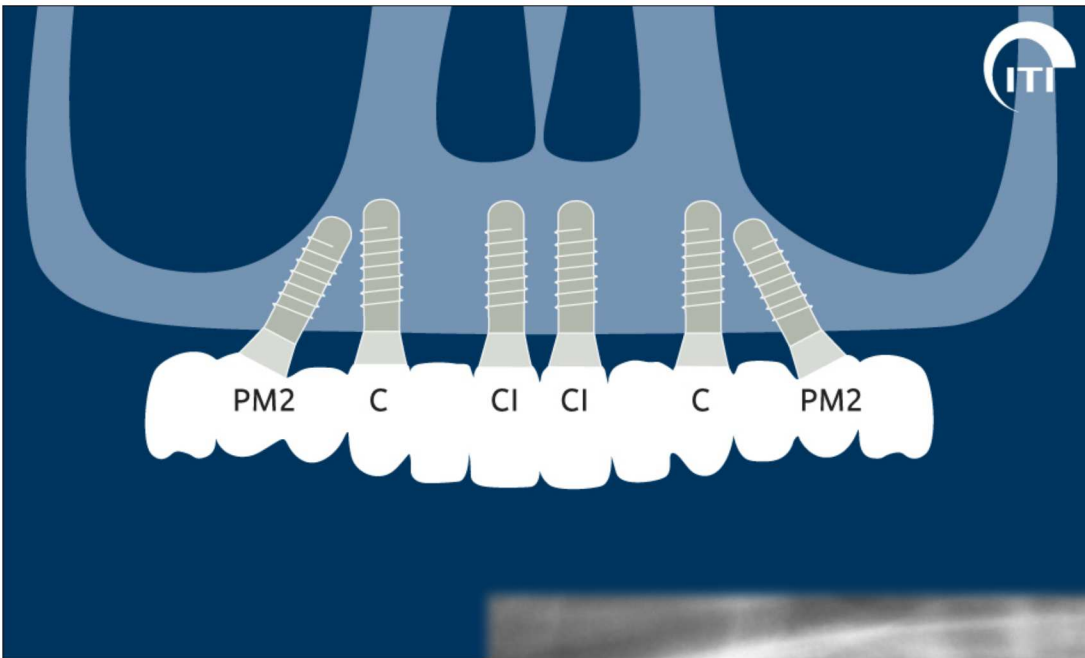


- **Sufficienti impianti ben dislocati**
- **Volontà di fare fusioni**
- **Protesi cementata o avvitata**

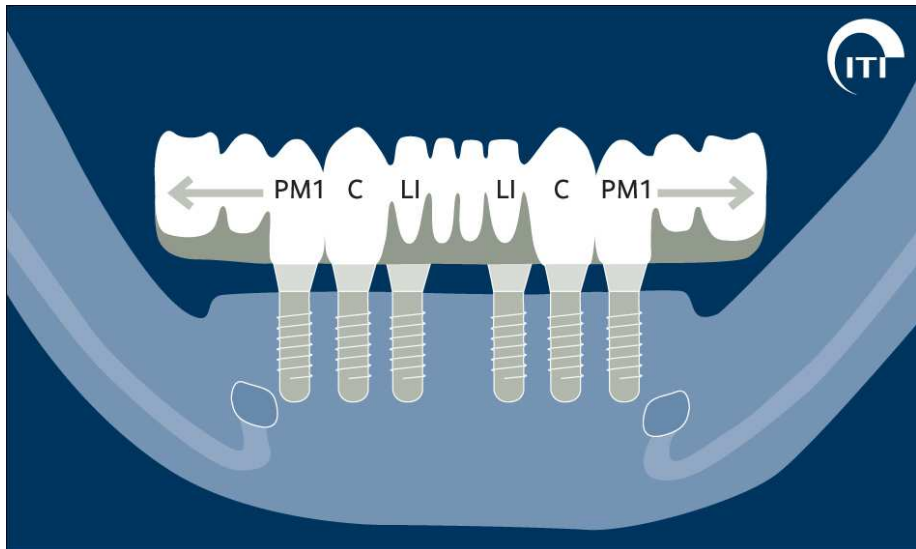
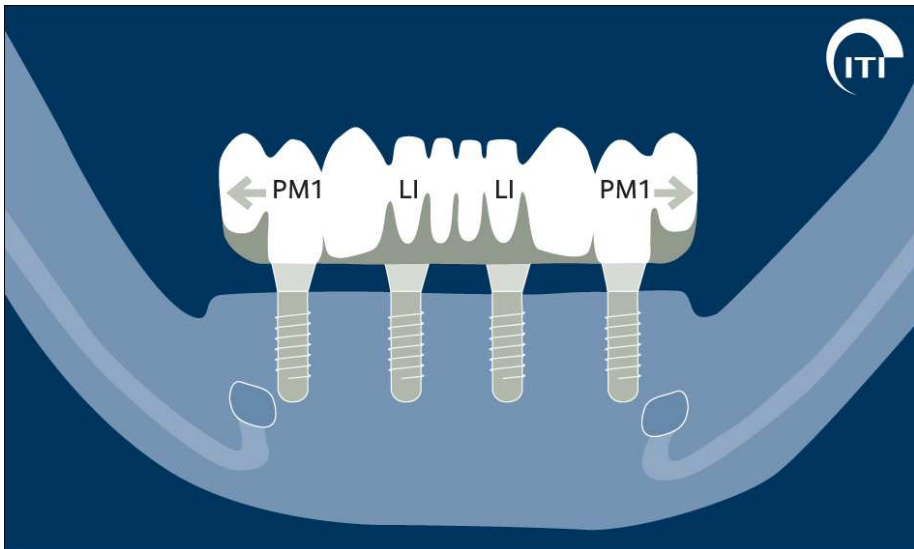
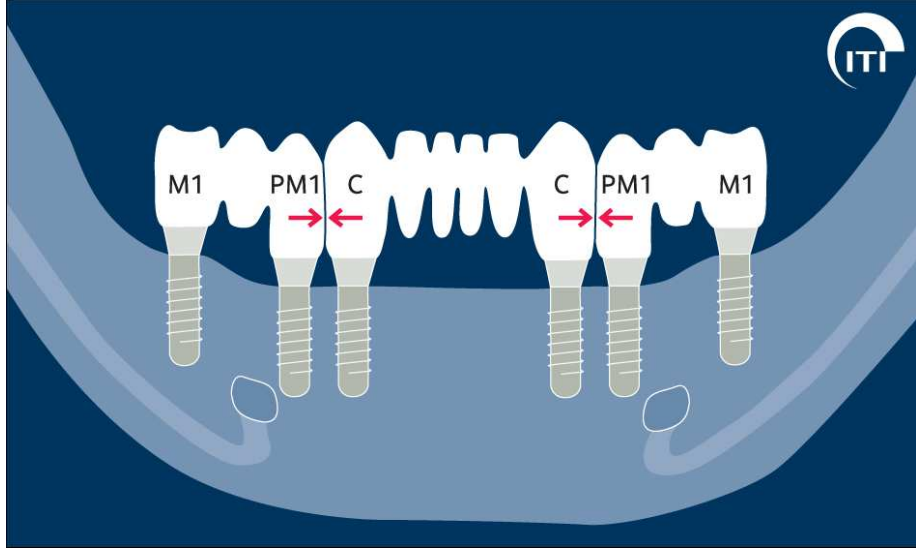
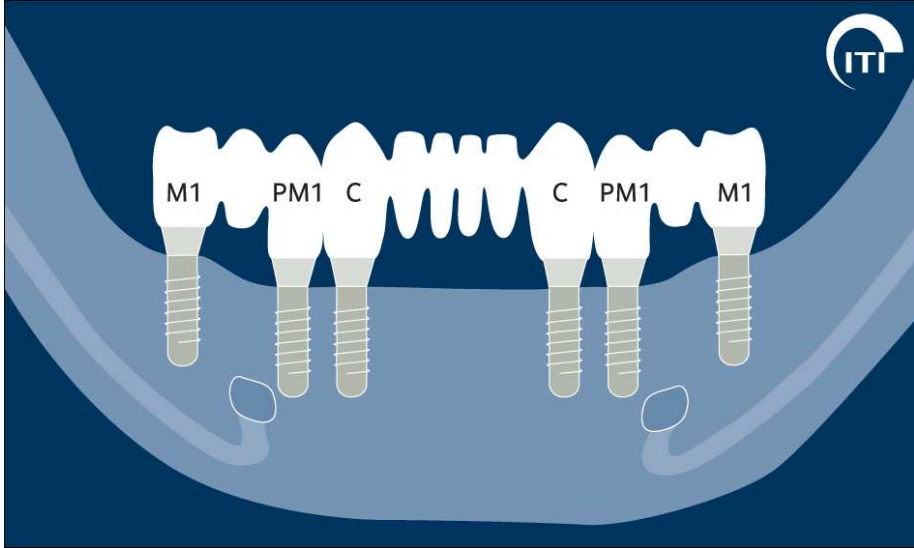


# Maxilla





# Mandible

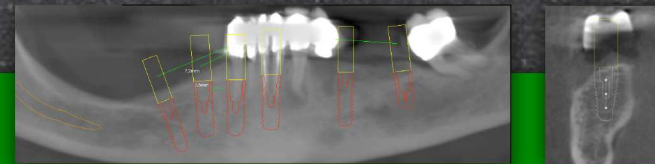




# Protocollo di analisi e pianificazione in edentulia



- Dimensione verticale
- Linea del sorriso
- Sostegno tessuti molli
- Congruità centro cresta

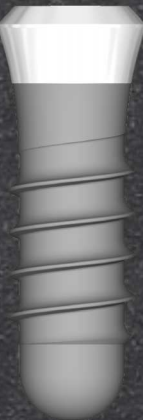


- Radiografie bidimensionali
- Radiografie tridimensionali (con dima radiologica)

• Protesi attuabile

• Implantologia attuabile

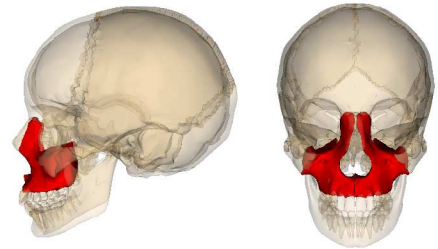
guida chirurgica



# Pianificazione nelle edentulie totali

## ■ Mascellare superiore

- Elevato valore estetico dento-gengivale
- Linea del sorriso e transizione protesica
- Elevato valore estetico da sostegno di labbra e guance
- Elevato valore fonetico
- Riassorbimento elevato e centripeto

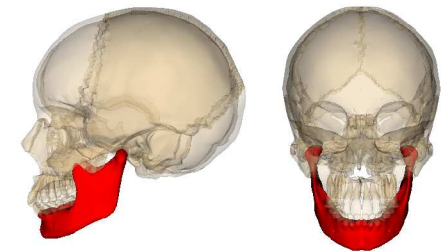


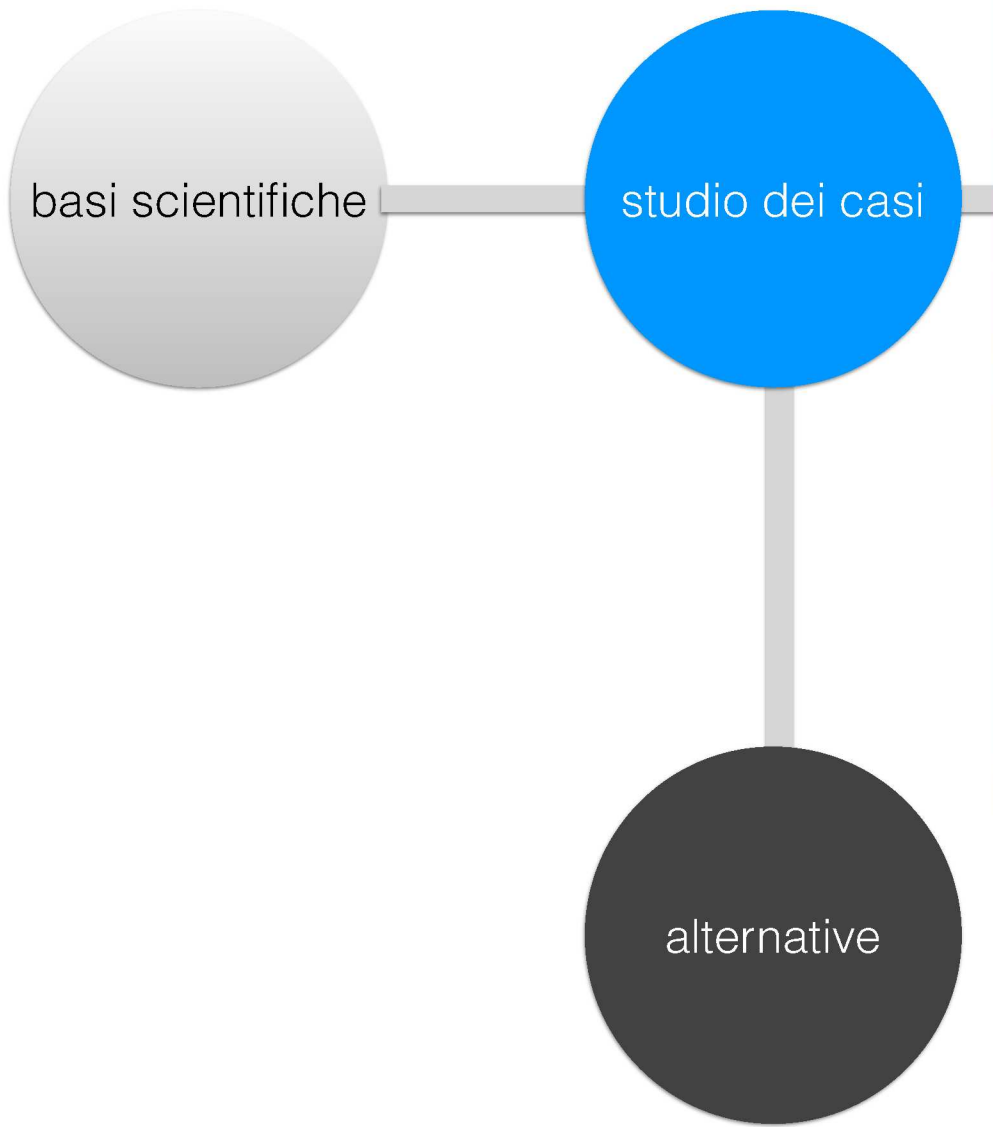


# Pianificazione nelle edentulie totali

## ■ Mandibola

- Scarso valore estetico dento-gengivale
- Medio valore estetico da sostegno di labbra e guance
- Scarso valore fonetico
- Riassorbimento variabile

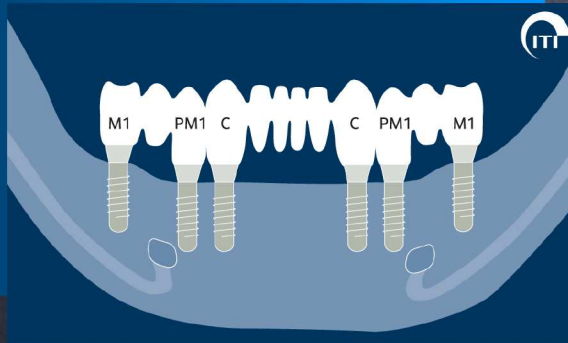




# Riabilitazioni fisse in edentulia totale

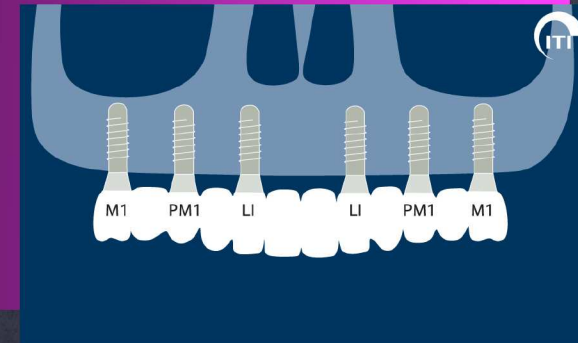
## Mandibola

- Carico immediato
- Staged approach
- Provvisorio removibile



## Mascellare

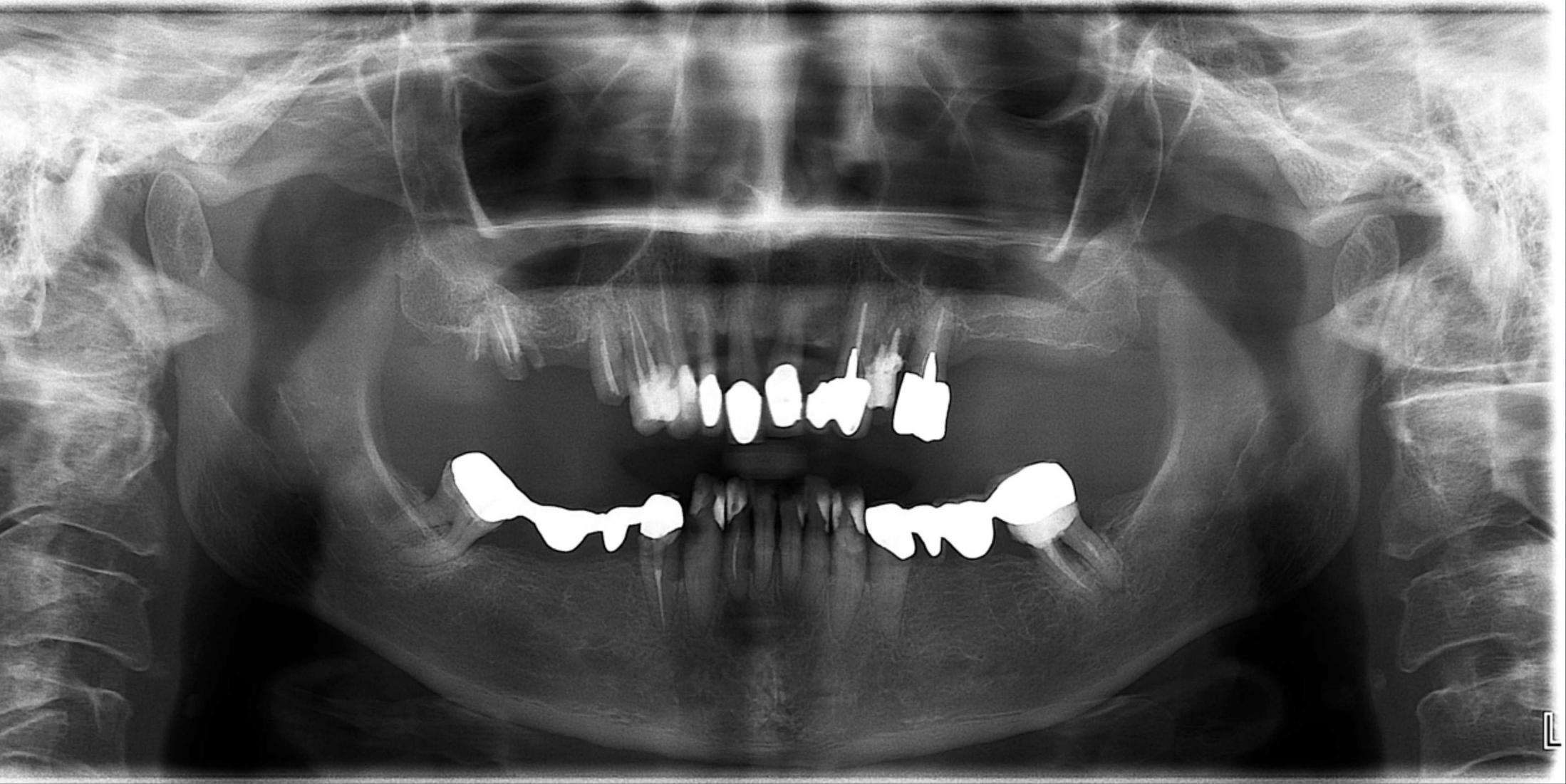
- Staged approach
- Carico immediato (analisi attenta)
- Provvisorio removibile senza flangia vestibolare anteriore







**Staged approach**



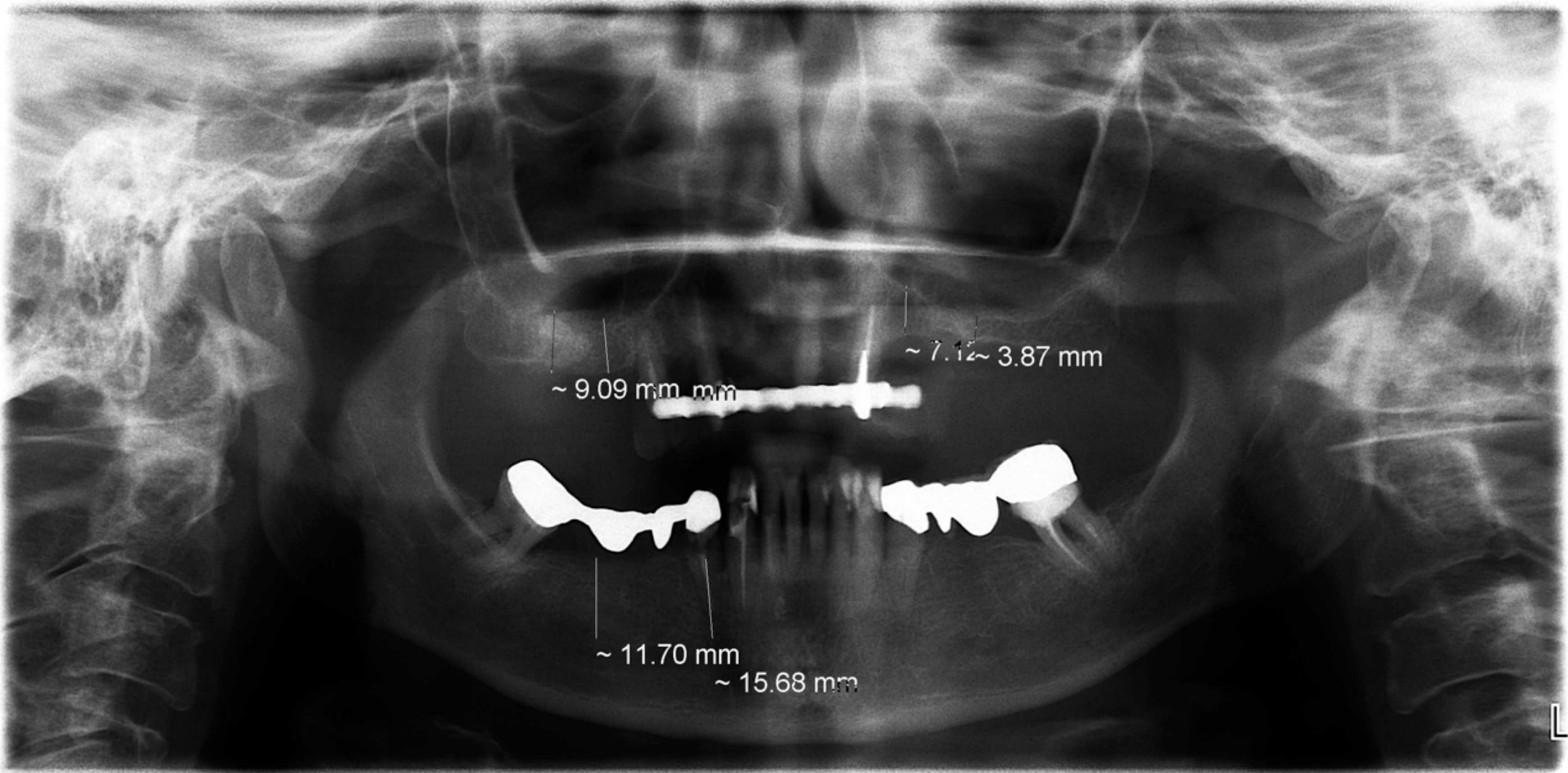
2TRQ6 ZZZUNC - / /

09/04/2009 68kV 11mA 18.3s 219.8mGy\*cm2 (RD3437419)

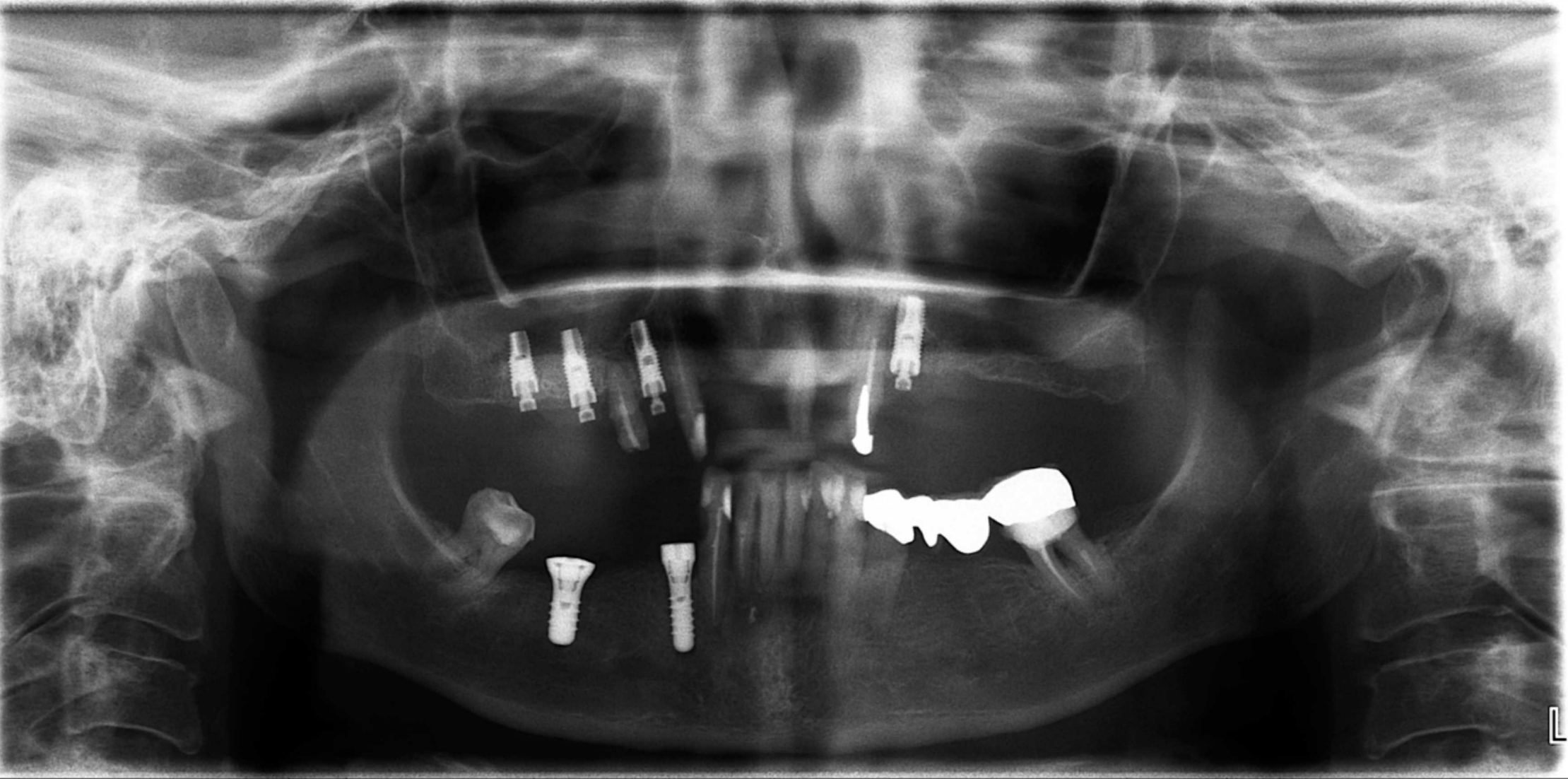
Dr. Massimo Frosecchi

Studio Dottor Frosecchi



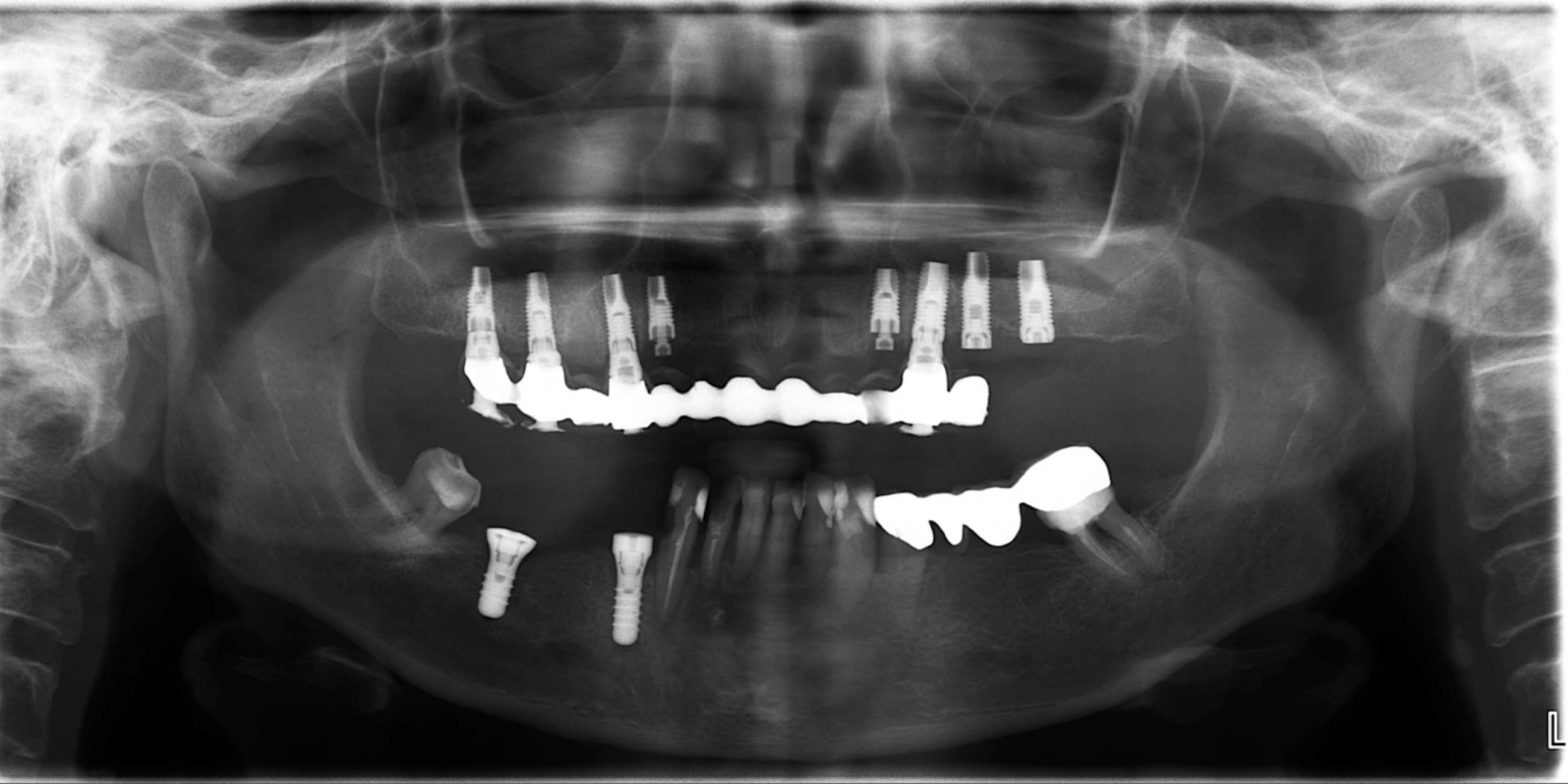


N2TRQ6 ZZZUNC - / /  
21/10/2009 62kV 5mA 18.3s 80.7mGy\*cm2 (RD3437419)  
Dott. Massimo Frosecchi  
Studio Dottor Frosecchi



N2TRQ6 ZZZUNC - / /  
25/01/2010 62kV 5mA 18.3s 80.7mGy\*cm2 (RD3437419)  
Dott. Massimo Frosecchi  
Studio Dottor Frosecchi





12TRQ6 ZZZUNC - / /  
7/02/2010 68kV 11mA 18.3s 219.8mGy\*cm2 (RD3437419)  
Dott. Massimo Frosecchi  
Studio Dottor Frosecchi





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controllo a 5 anni

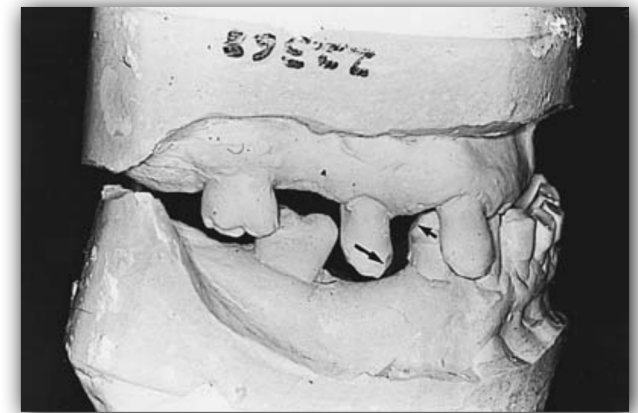
# Analisi antagonista

- Distanza impianto/antagonista  $<4\text{mm}$ : nessuna possibilità protesica .
- Distanza impianto/antagonista  $<6\text{mm}$ : solo protesi avvitata.
- Distanza eccessiva(?): analisi ceratura per determinare rischi estetici, di invasione spazio linguale o di intasamento alimentare



## Clinical examination – alveolar ridge

- Three-dimensional bone resorption may dictate adjunctive augmentation procedures such as horizontal and/or vertical ridge augmentation
- In such severe cases, a **diagnostic wax-up** is mandatory



*Chiapasco et al. 2008*





