



THE UNIVERSITY OF
WESTERN AUSTRALIA

Management of Edentulism and the Terminal Dentition - Maxilla Fixed

Clin A/Prof Glen Liddelow

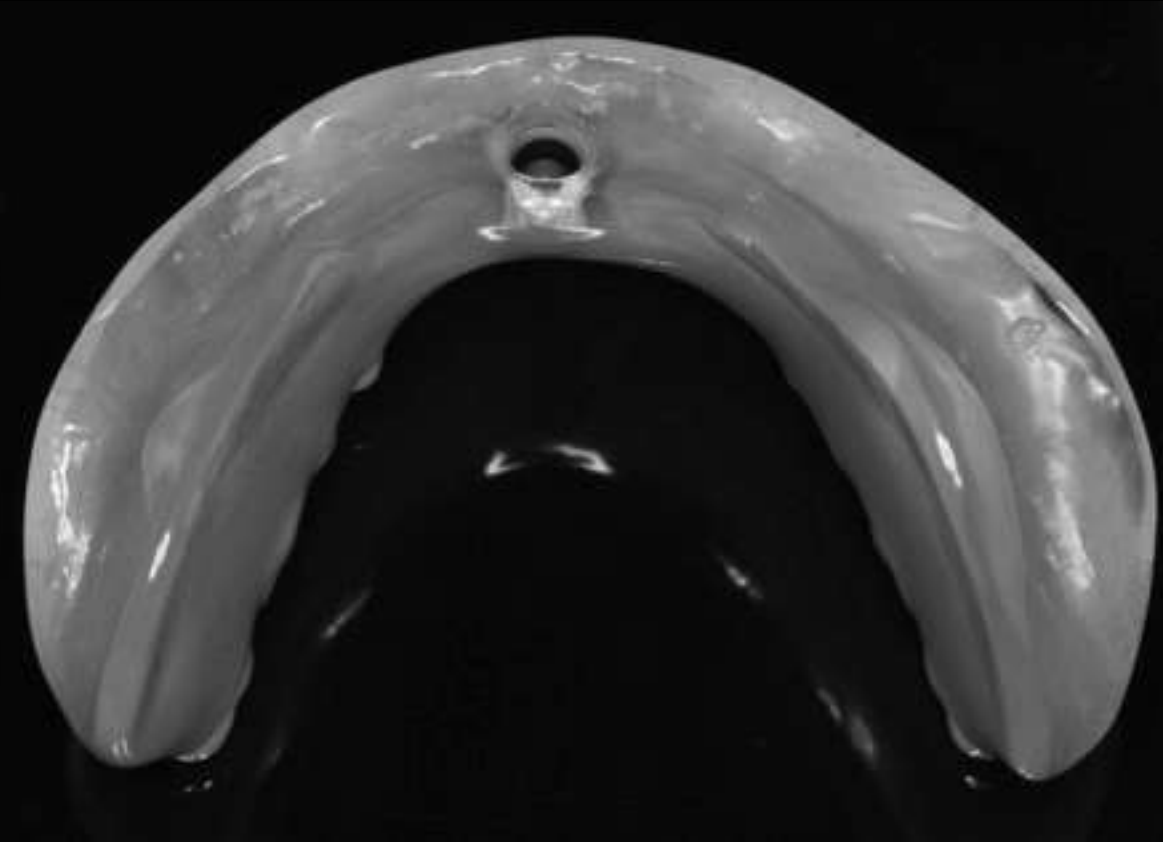
BDSc(WA), MScD(WA), DClinDent(Syd), MRACDS(Pros), FPFA, FICD, FRACDS

B R Å N E M A R K C E N T R E P E R T H

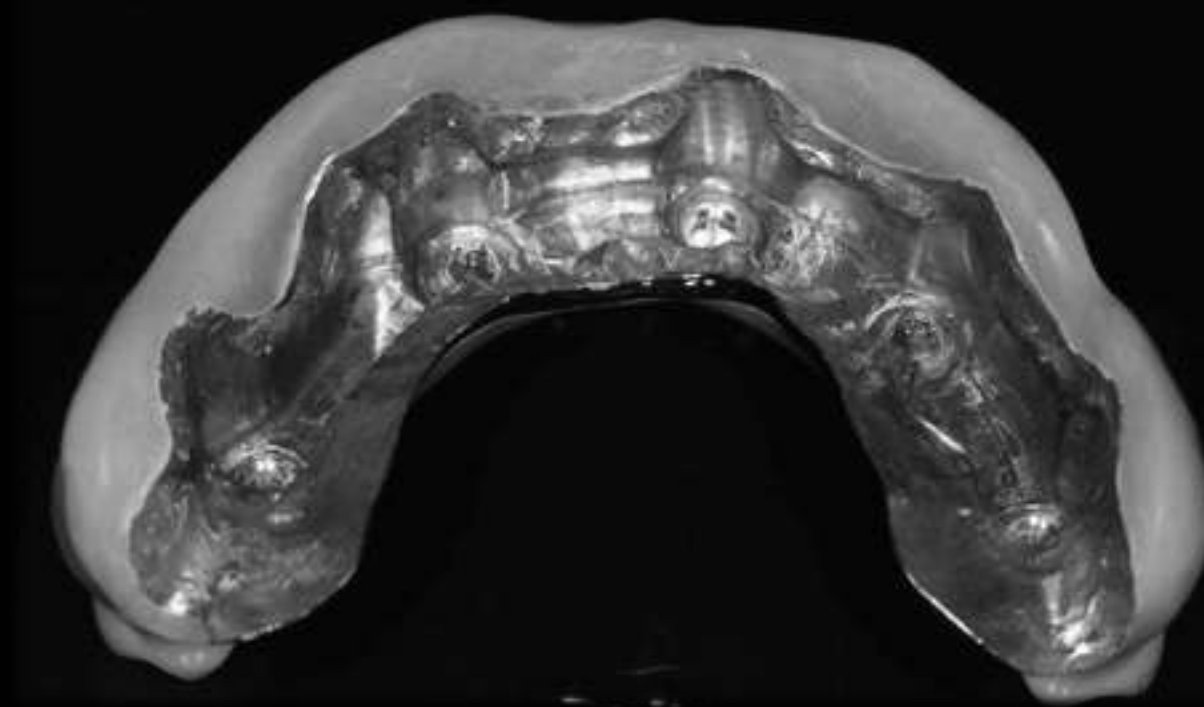
Treatment strategies for the edentulous jaw



Complete
Denture



Implant
Overdenture

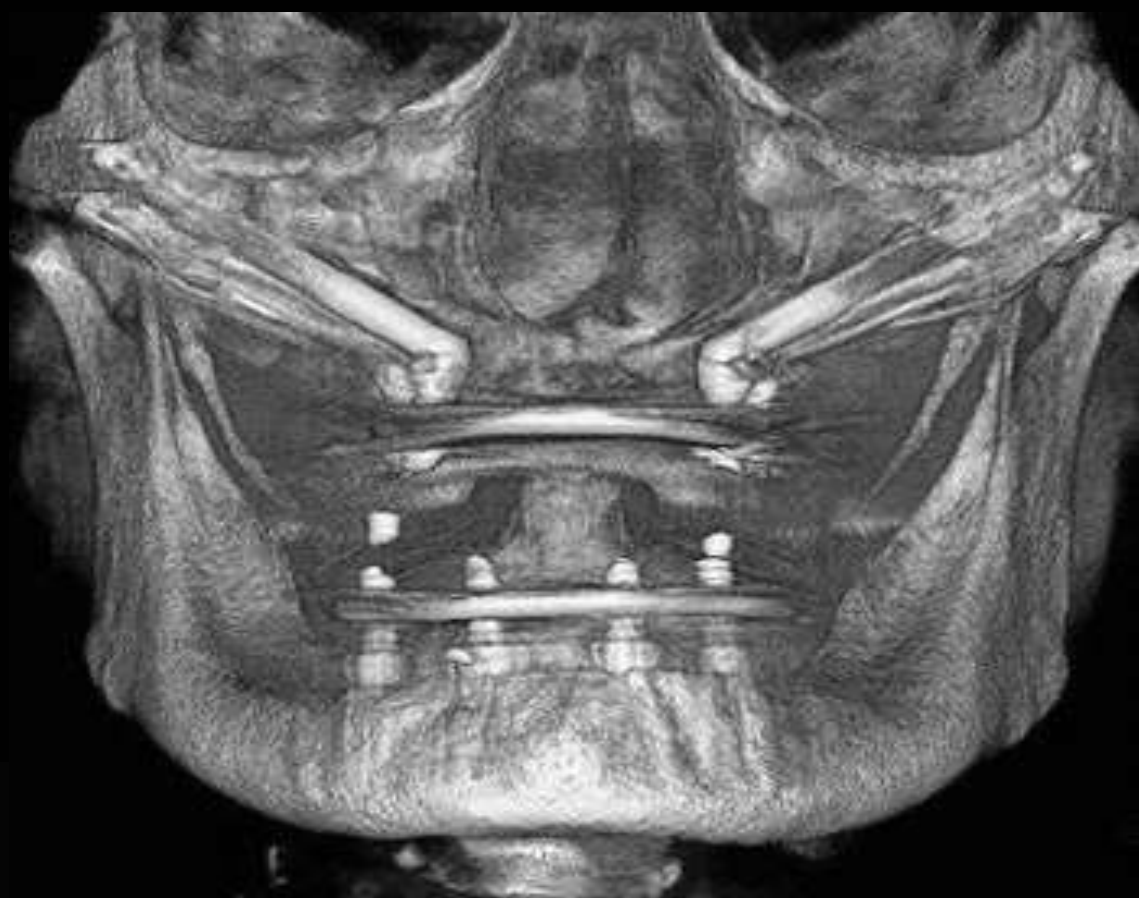


Implant
Detachable
Prosthesis



Fixed
Prosthesis

Lecture 3



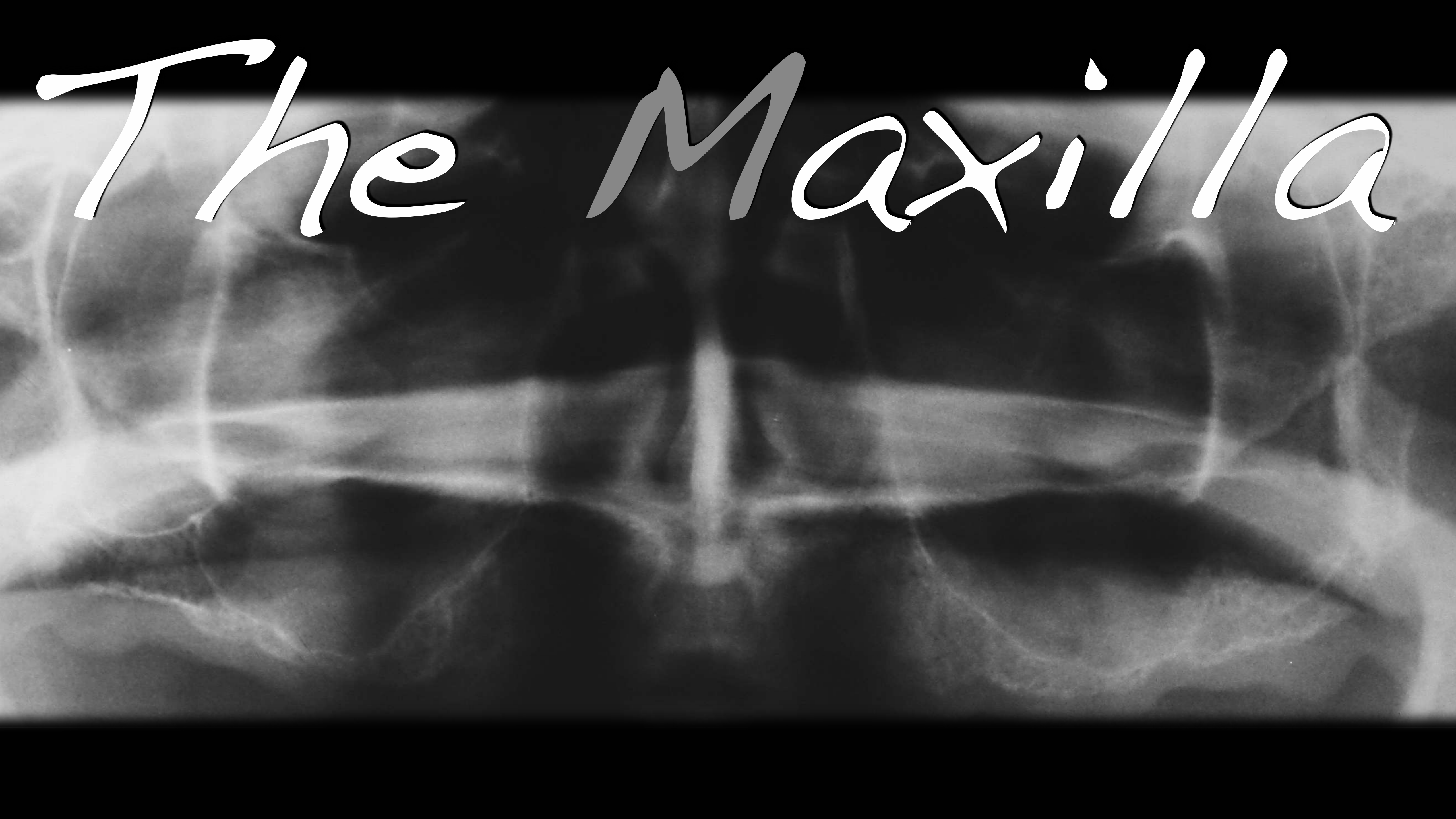
Fixed
Prosthesis
Maxilla

Treatment strategies for the edentulous jaw

Maxillary complete denture prosthetics

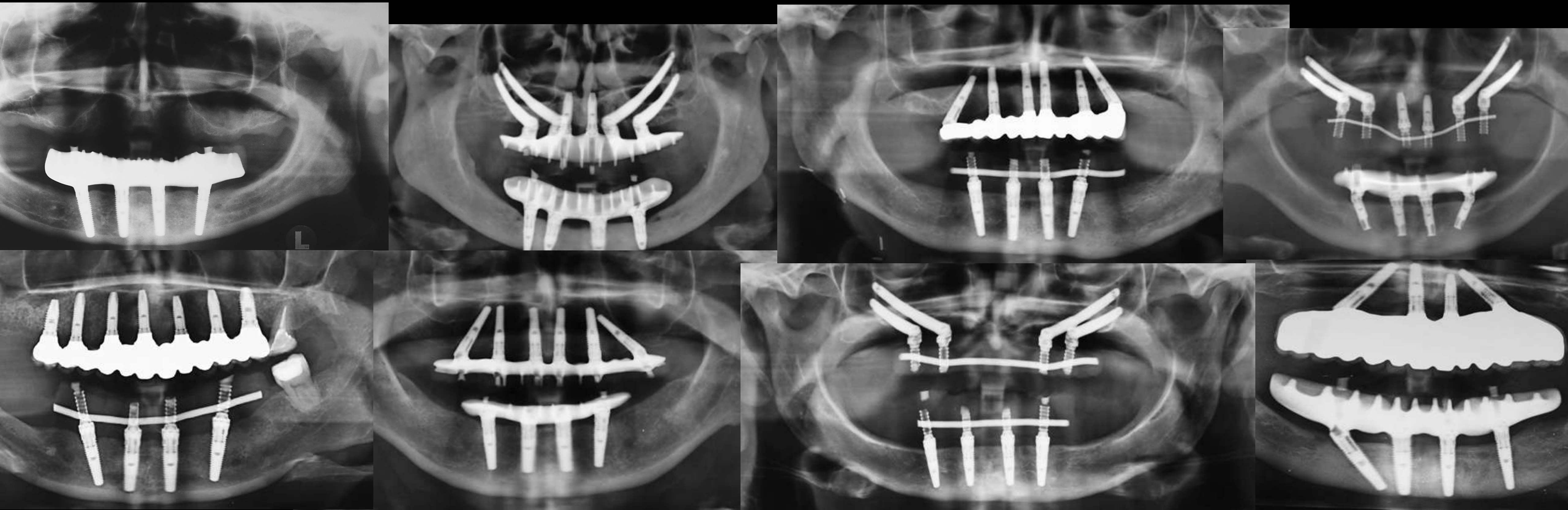
- Mandibular prosthodontics
- Mn IOD
- Mn IFP (Least maintenance)
- Review at 12 months (75% satisfied)





The Maxilla

Treatment of Edentulism



Friberg B, Jemt T. Rehabilitation of edentulous mandibles by means of four TiUnite implants after one-stage surgery: a 1-year retrospective study of 75 patients. Clin Implant Dent Relat Res. 2010;12 Suppl 1:56-62.

Friberg B, Jemt T. Rehabilitation of edentulous mandibles by means of five TiUnite implants after one-stage surgery: a 1-year retrospective study of 90 patients. Clin Implant Dent Relat Res. 2008;10(1):47-54.

IMMEDIATE LOADING

Edentulous Jaws

1991 - Single stage surgery and immediate loading - T-033C

1994 - Routine lower jaw on 4 implants, immediate loading

1998 - Branemark Novum - T-086

2000 - Immediate loading maxilla

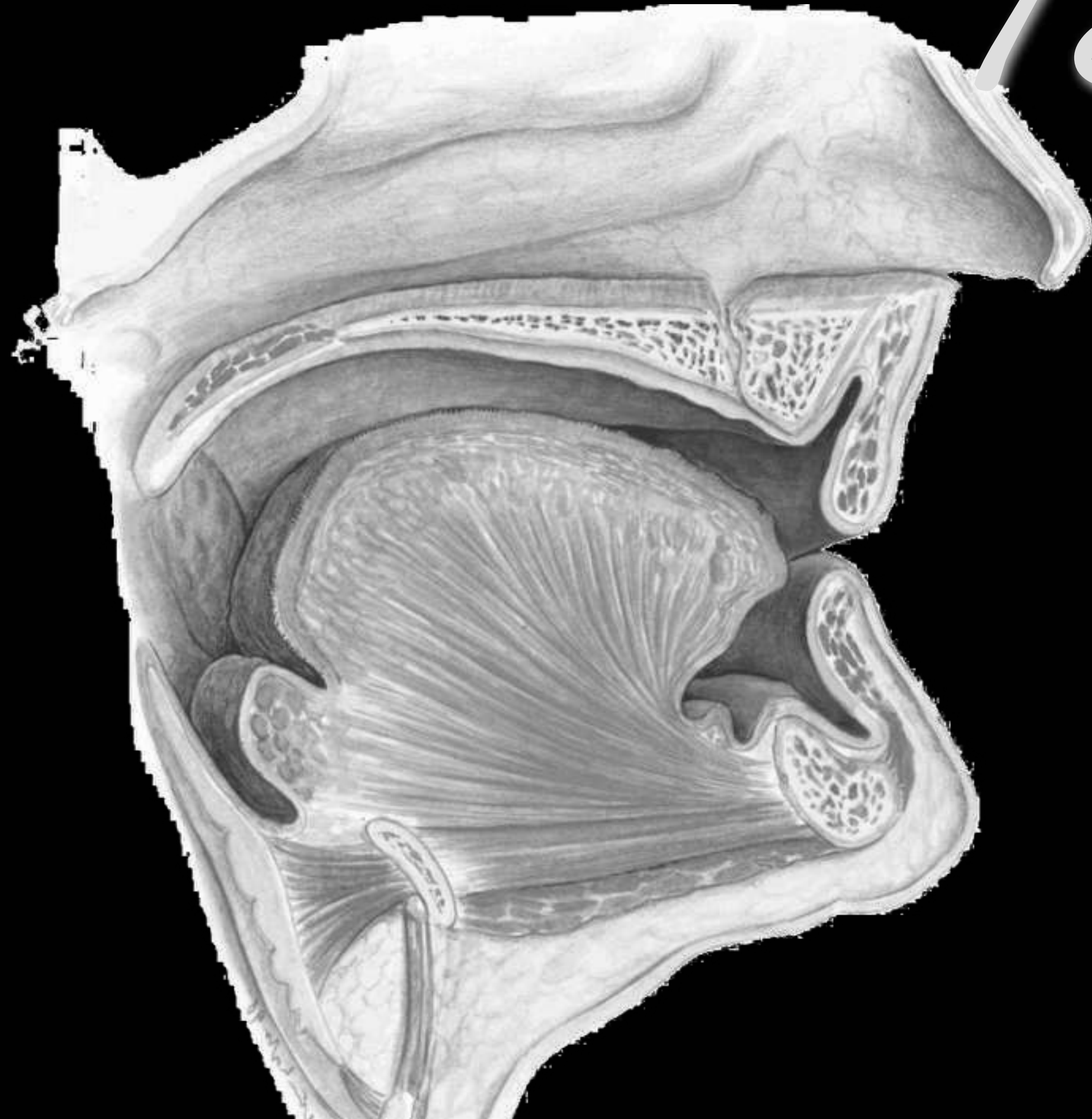
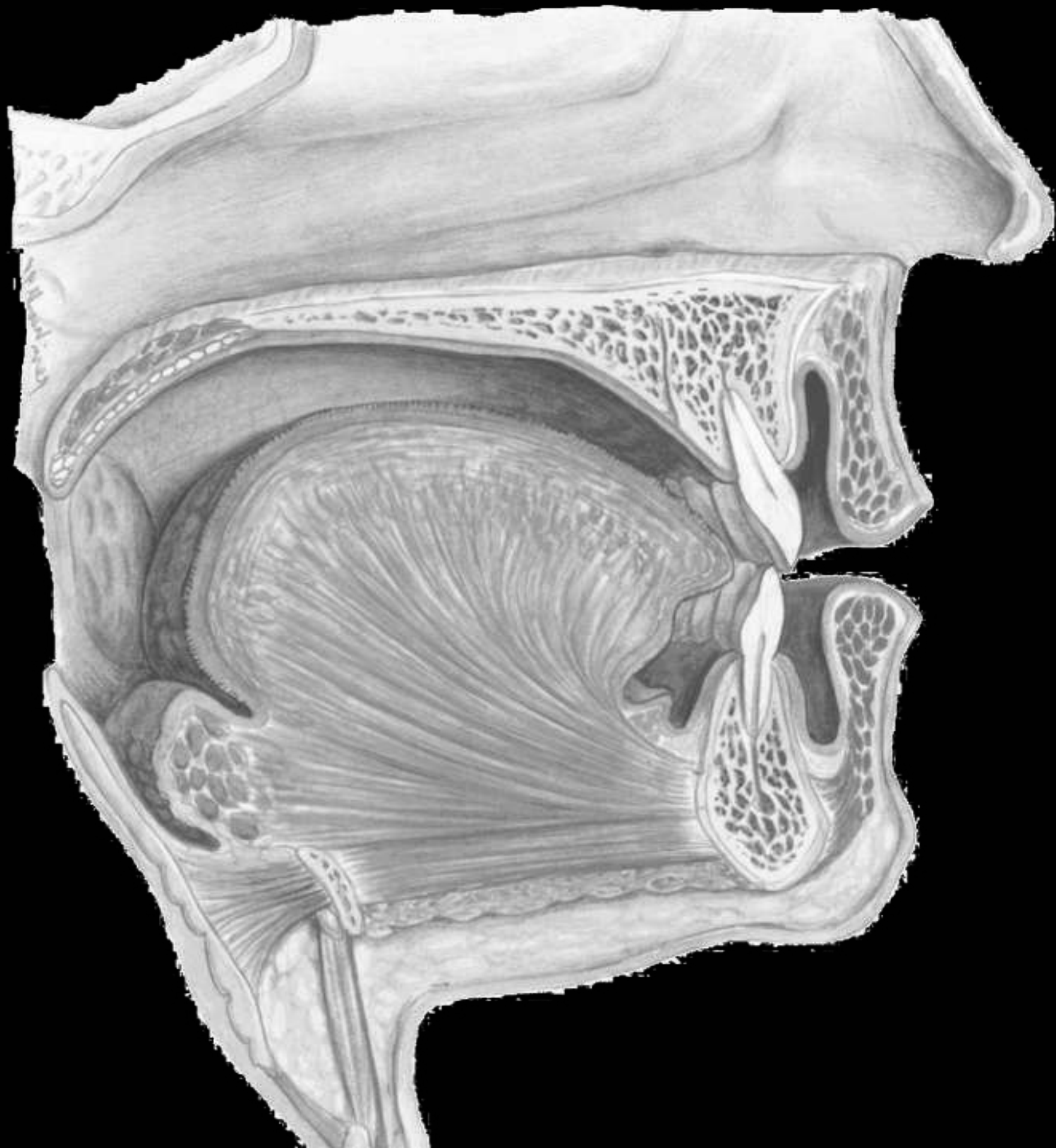
2003 - Teeth in an hour (NobelGuide)

2008 - Immediate loading of Zygoma implants



Sequelae of tooth

loss



Factors to consider

Initial aesthetic expectation

Current dentition, prostheses



WHAT ARE THE ISSUES?

ANALYZE THE DIFFERENCE

Facial Aesthetics



WHAT ARE THE ISSUES?

Lip
Support

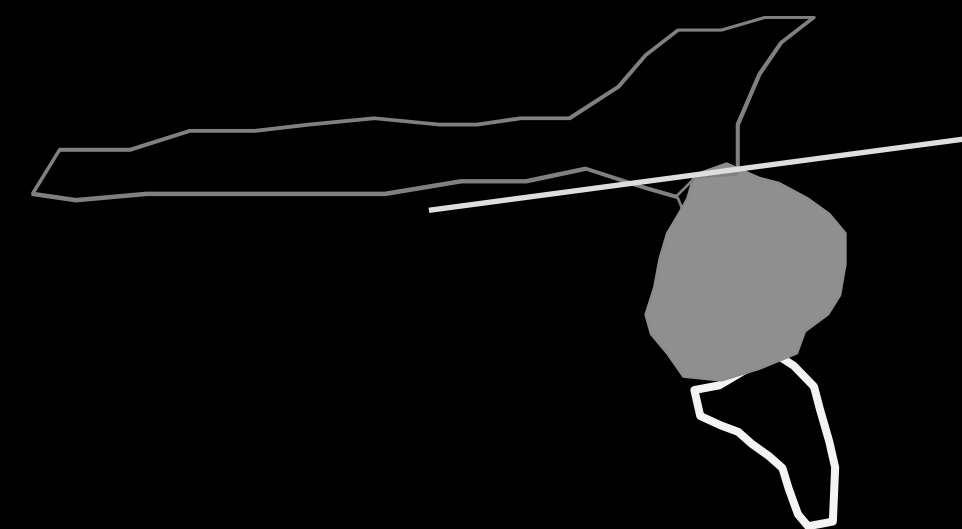
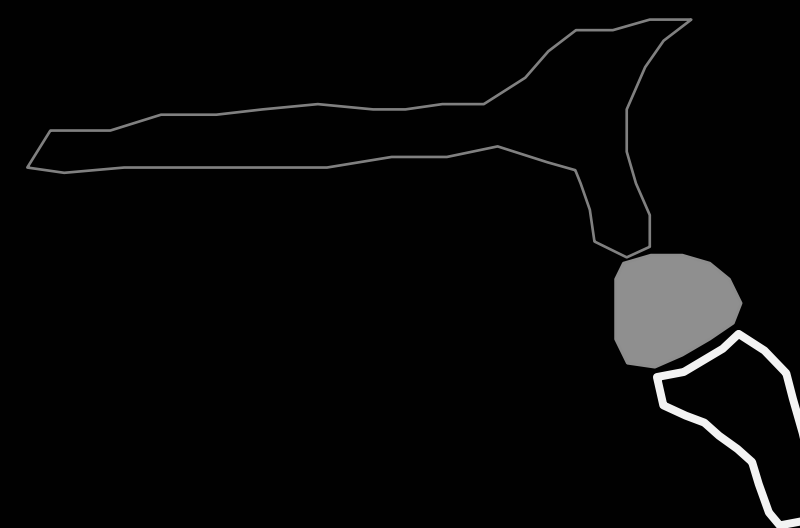
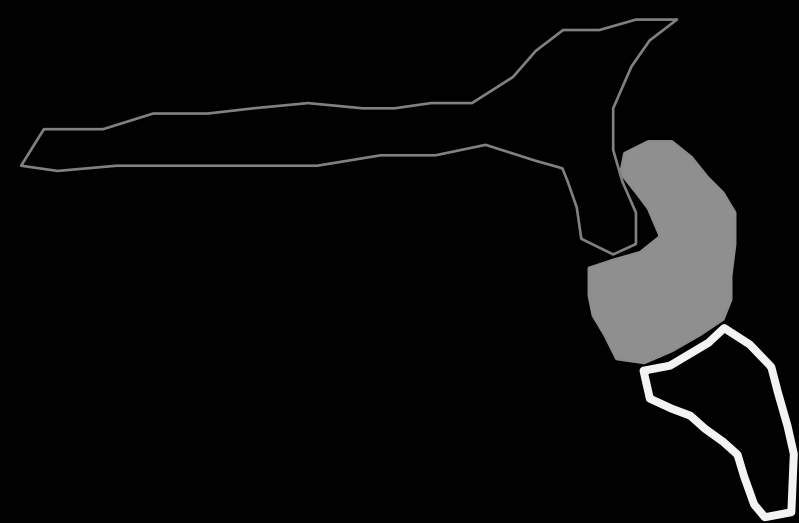


Ridge Reduction *Facial Support*

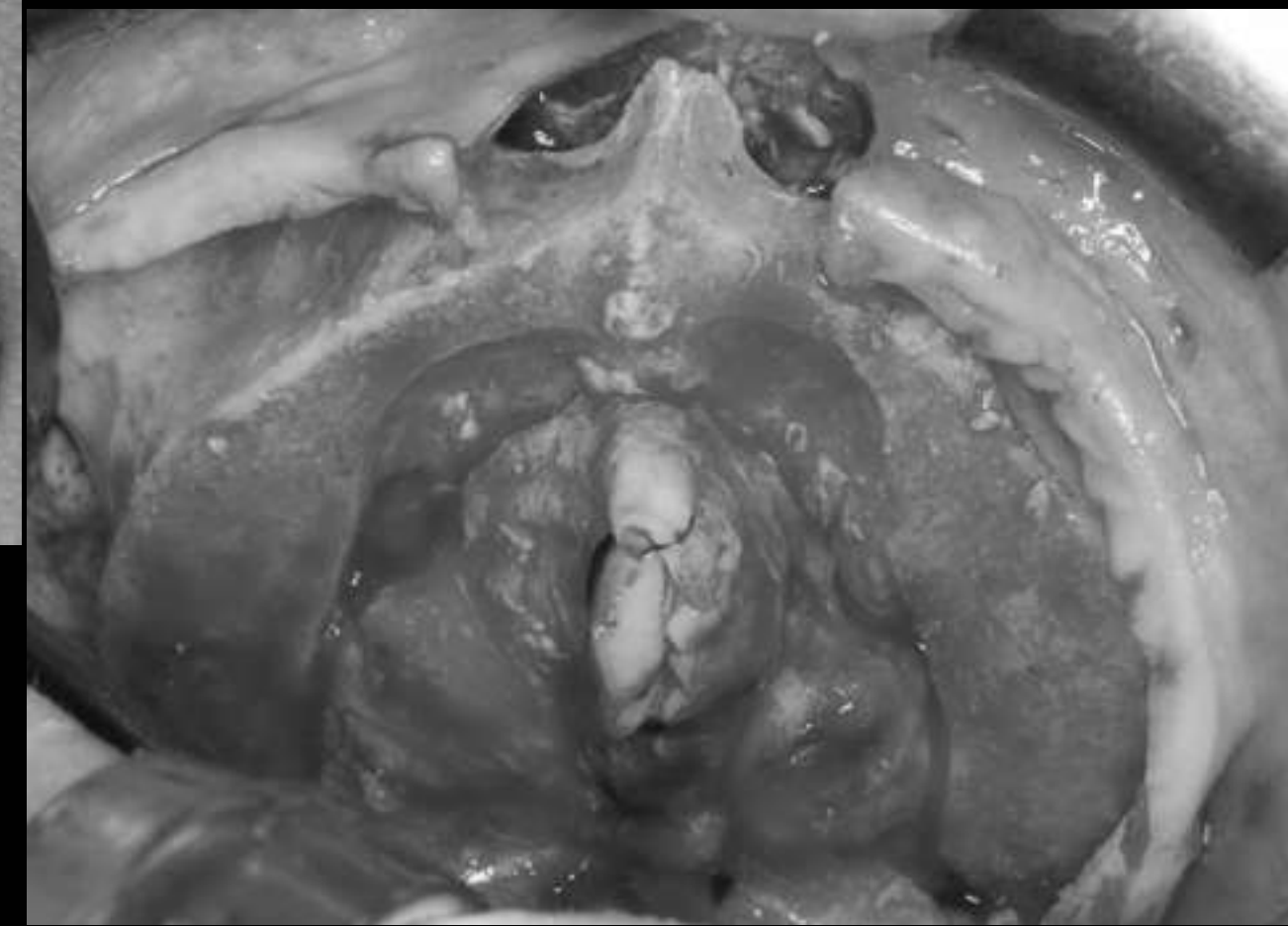


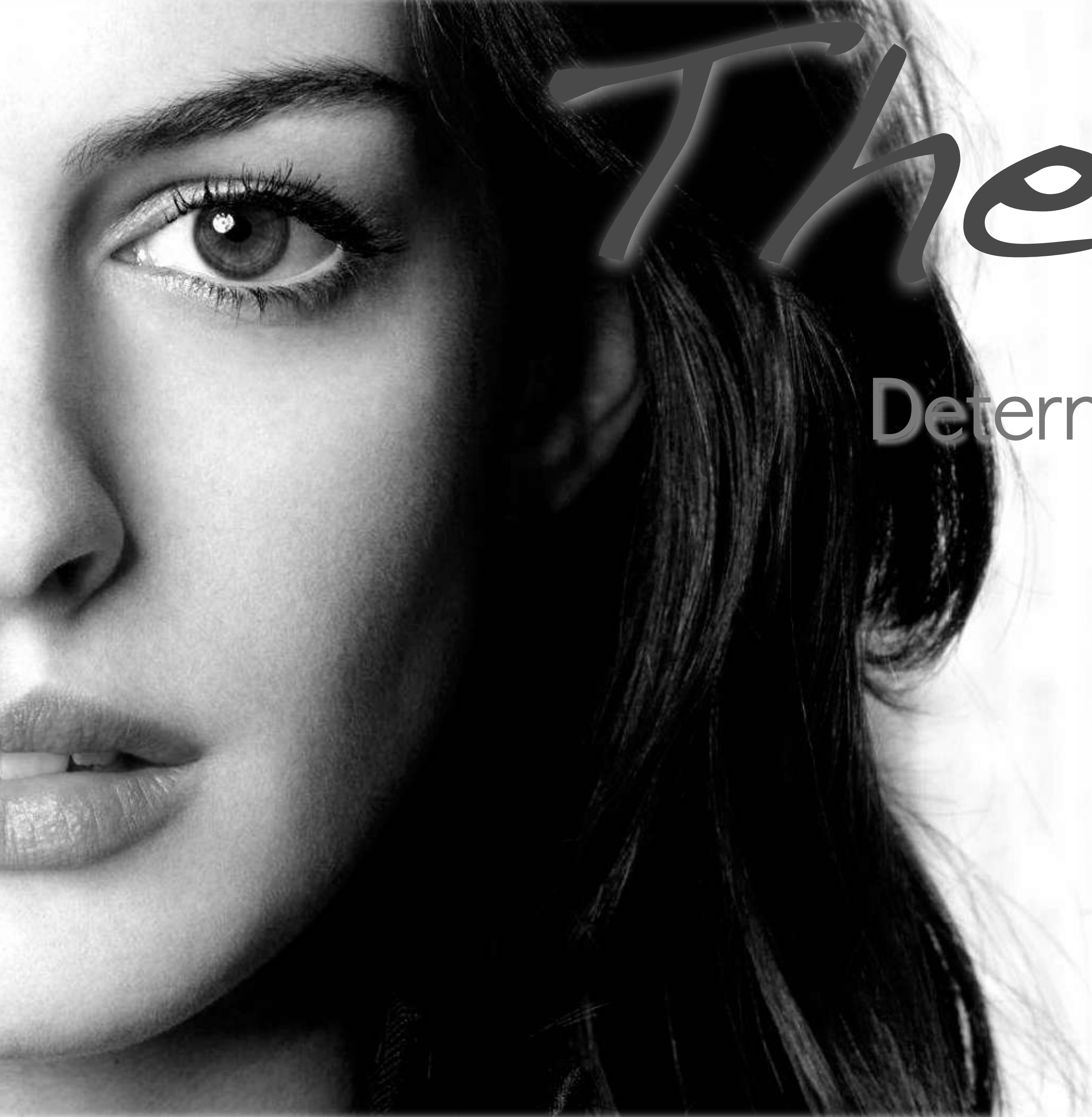
Ridge Reduction

Facial Support



Ridge Reduction





The Face

Determination of tooth position
within the face

Where do you want
your front teeth?



WHAT ARE THE ISSUES?

Tooth aesthetics and function





M-Ah

Interocclusal rest
space 4mm

Dental exposure

Mx 2-3mm



F,V

Vermillion 1mm
lingual



E

Interlabial space
occupied by Mx
teeth 72%



S

Mandibular movement

Horiz 2mm

Interarch space 2mm

Fradeani M. Esthetic Analysis: A systematic approach to prosthetic treatment. Quintessence, Illinois. 2004

Spear F, Kokich V, Mathews D. Interdisciplinary management of anterior dental esthetics. J Am Dent Assoc 2006;137:160-169.

Pound E. Let "s" be your guide. J Prosthet Dent. 1977;38:482-489.

Digital Smile Design

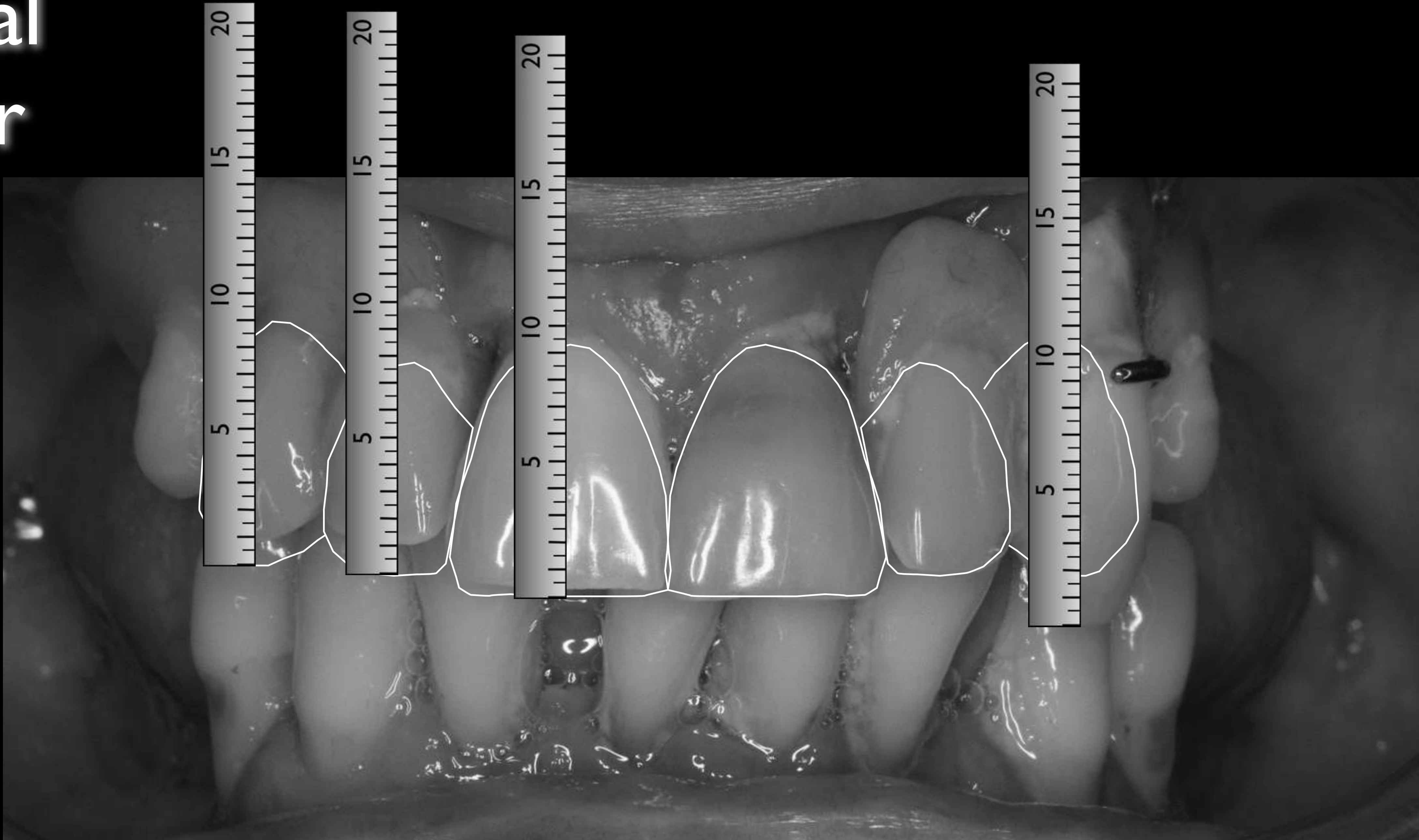
Ability to quantify changes to technician

More useful for tooth borne pros - limitations with face bow

Visualisation of final result

Patient communication

Digital Ruler



Tooth Outline



“Real

Face

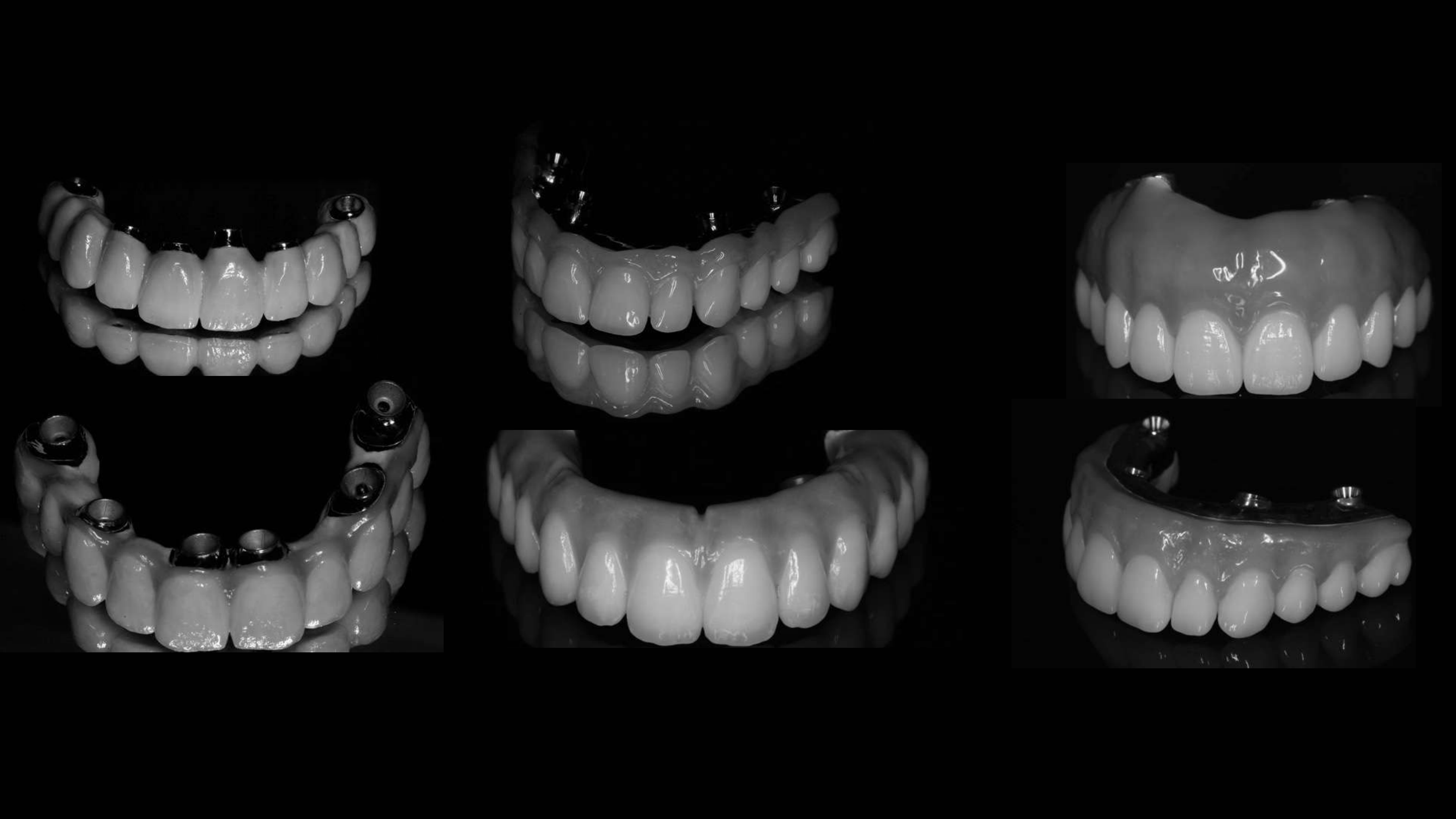
Bow”





*Junction between implant and
prosthetic tooth determines lip
support and phonetic surface*







The

Face



Transfer to radiographic
work up and
NobelClinician software

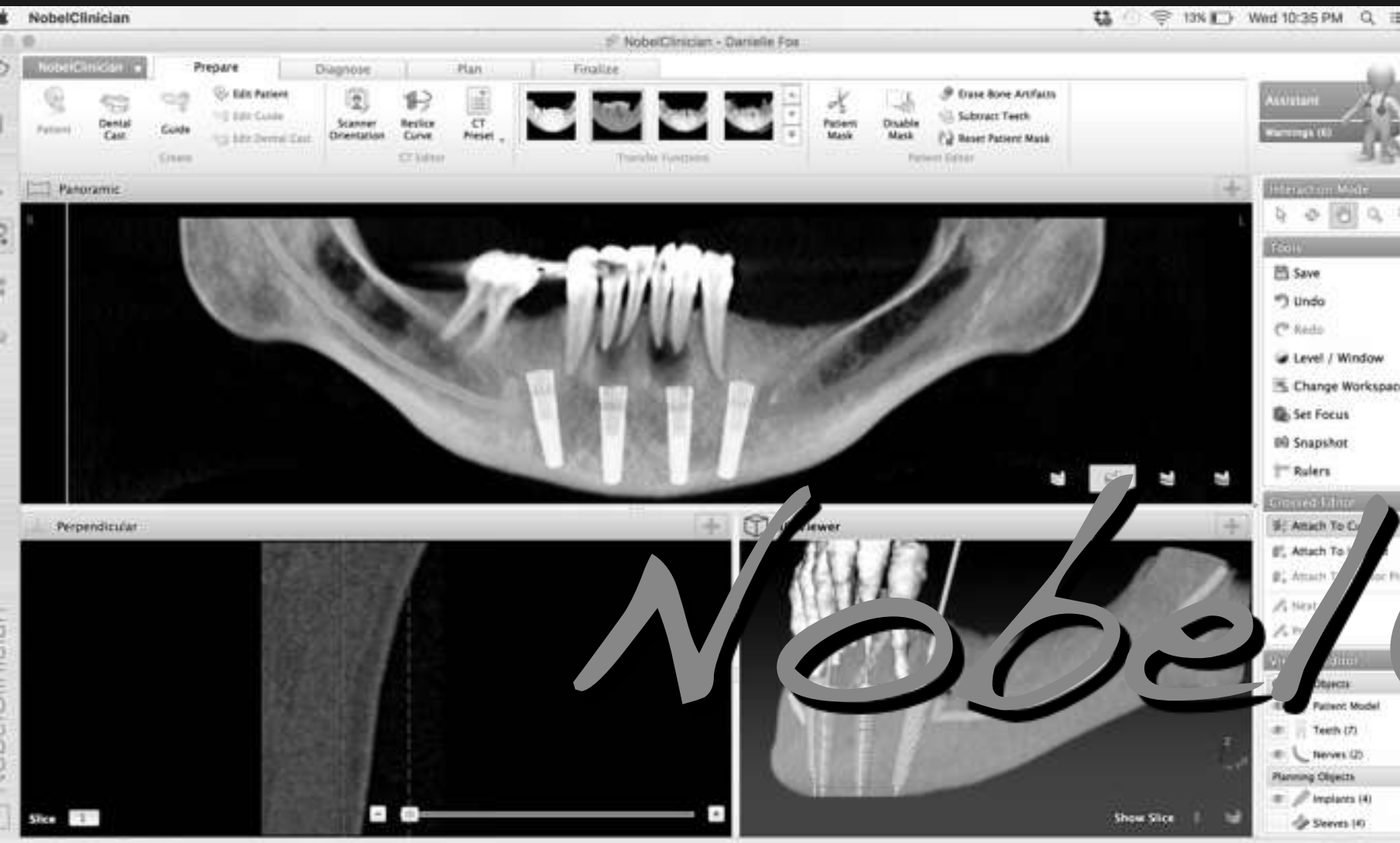
Double Scan

Double Scan

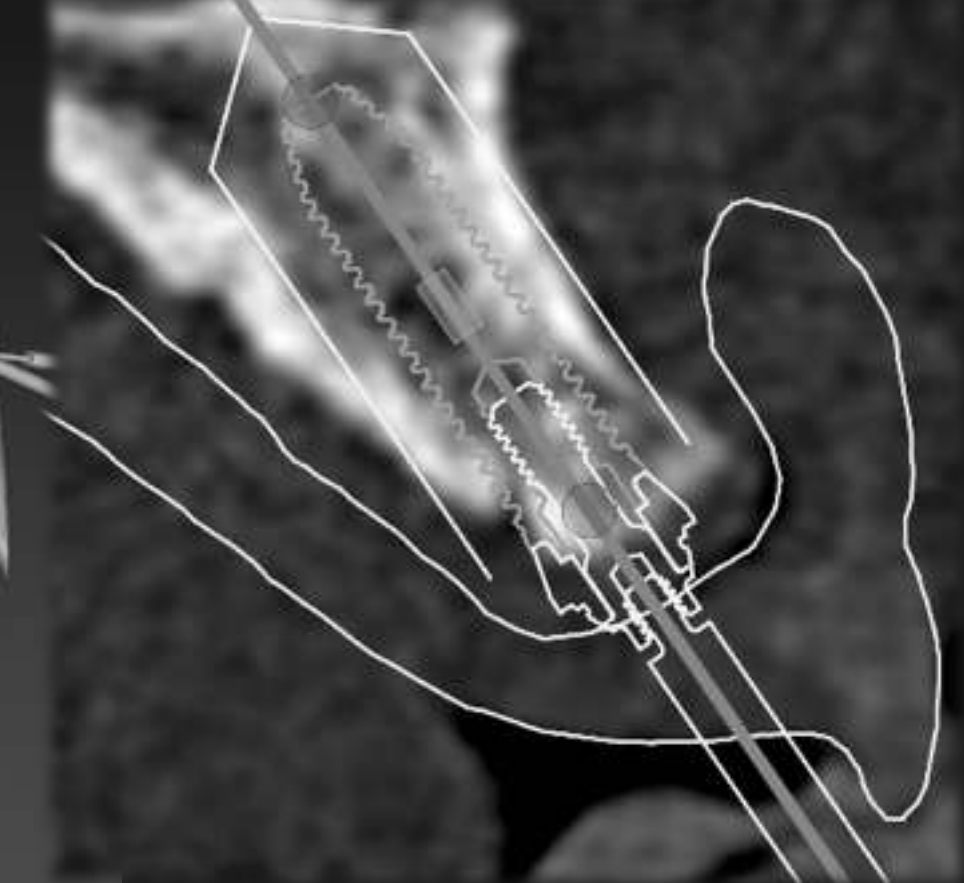
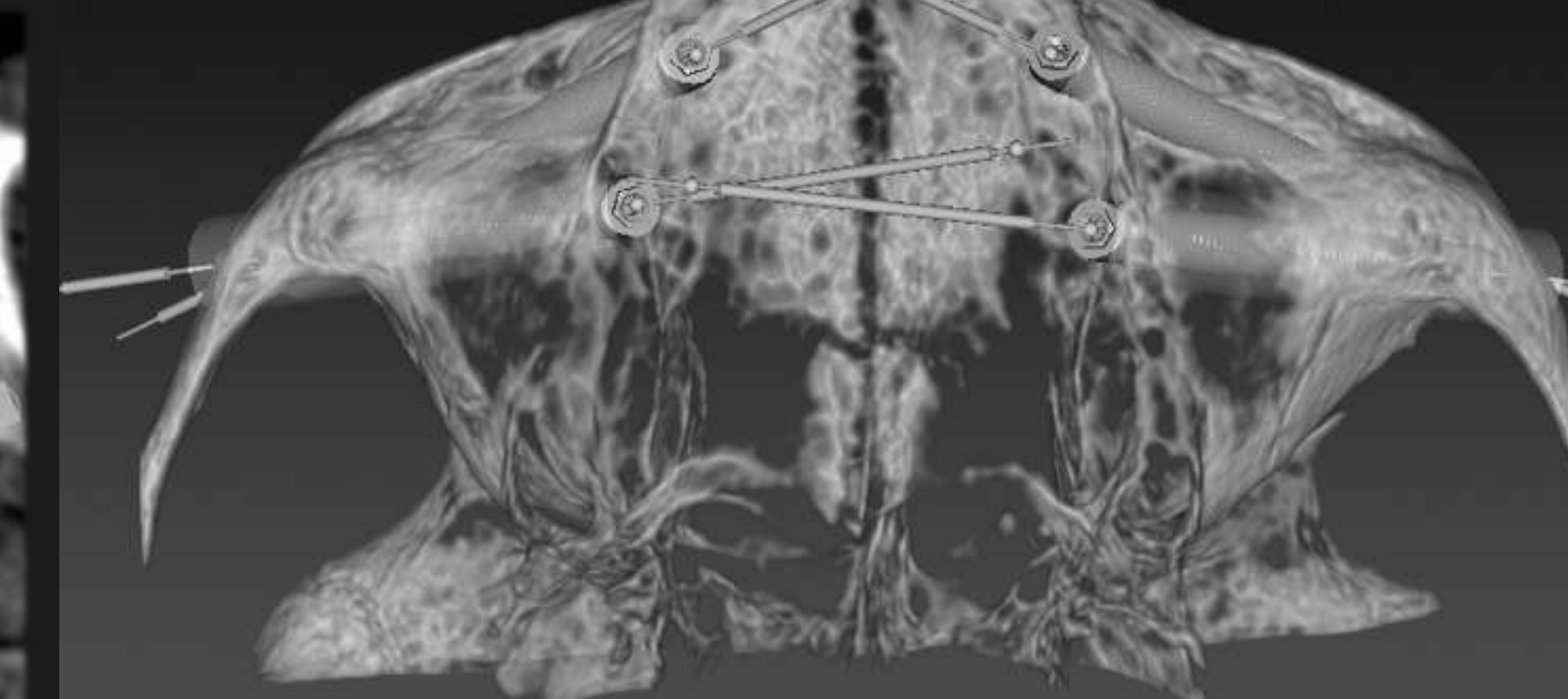
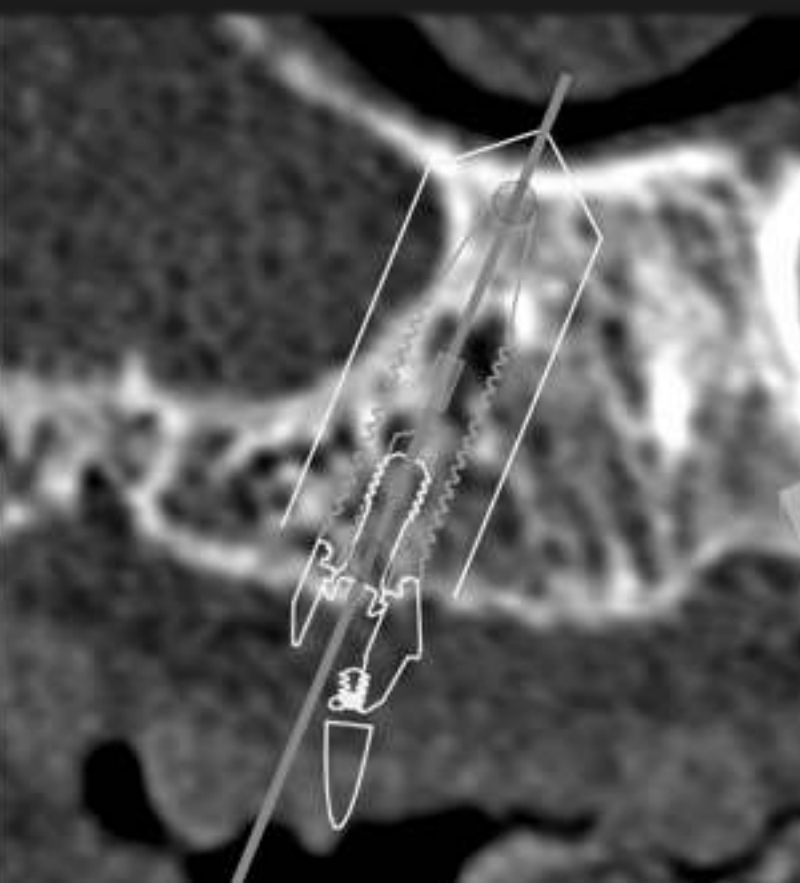
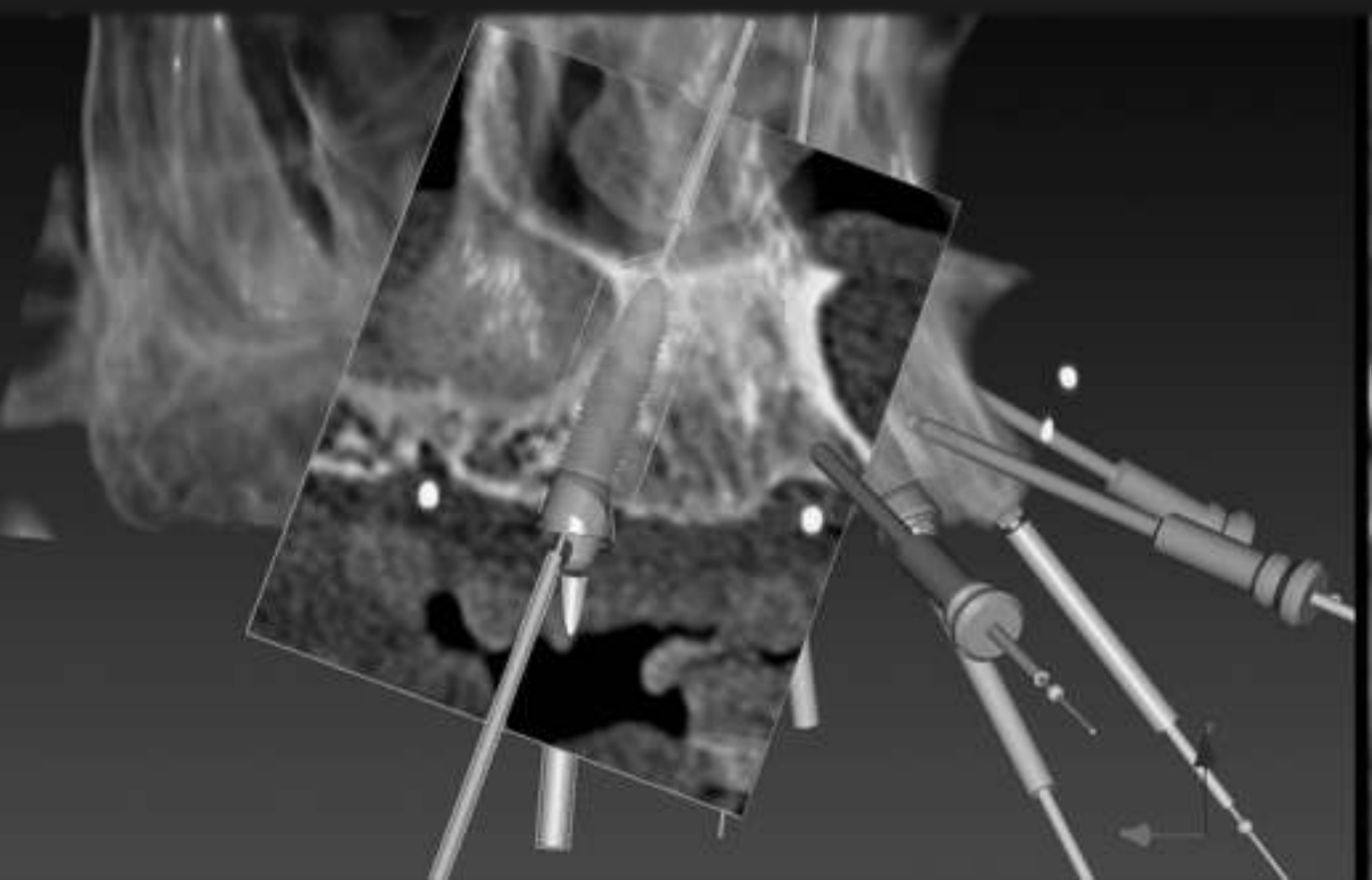
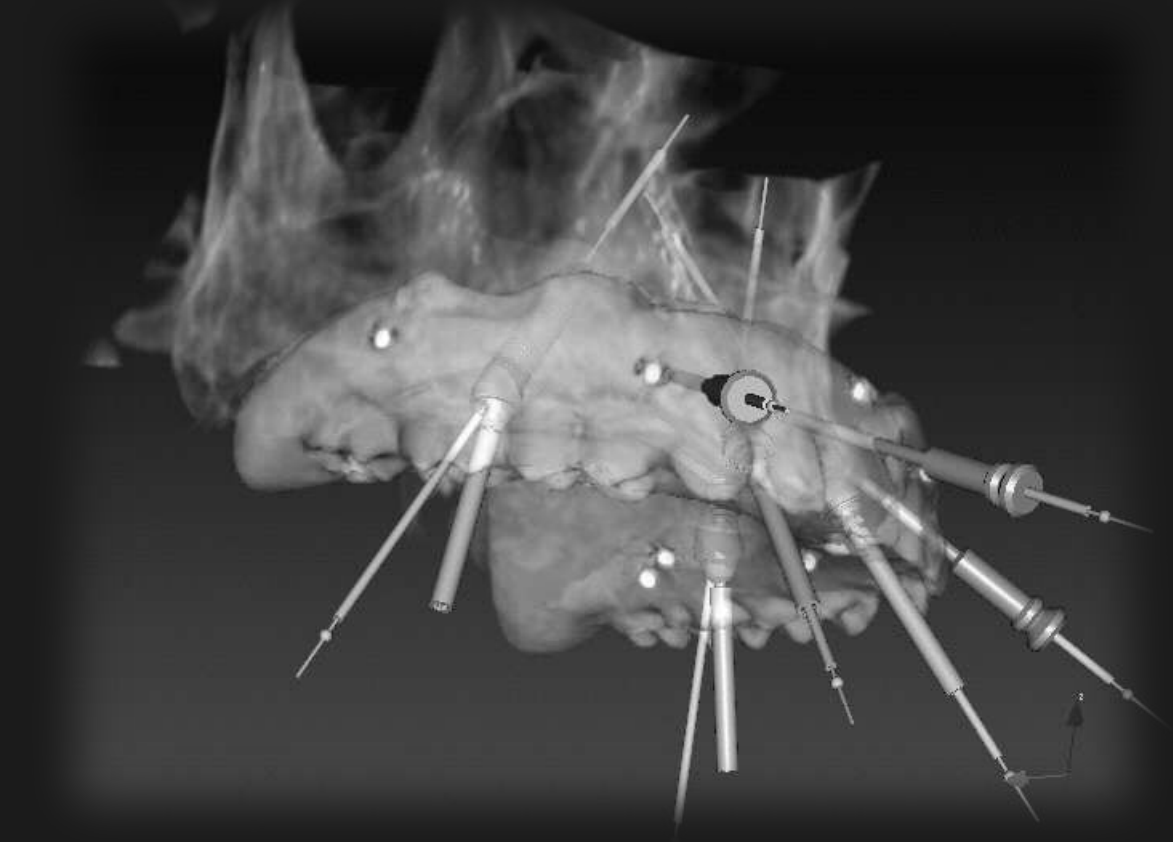


Planning implant placement - Prosthetically driven



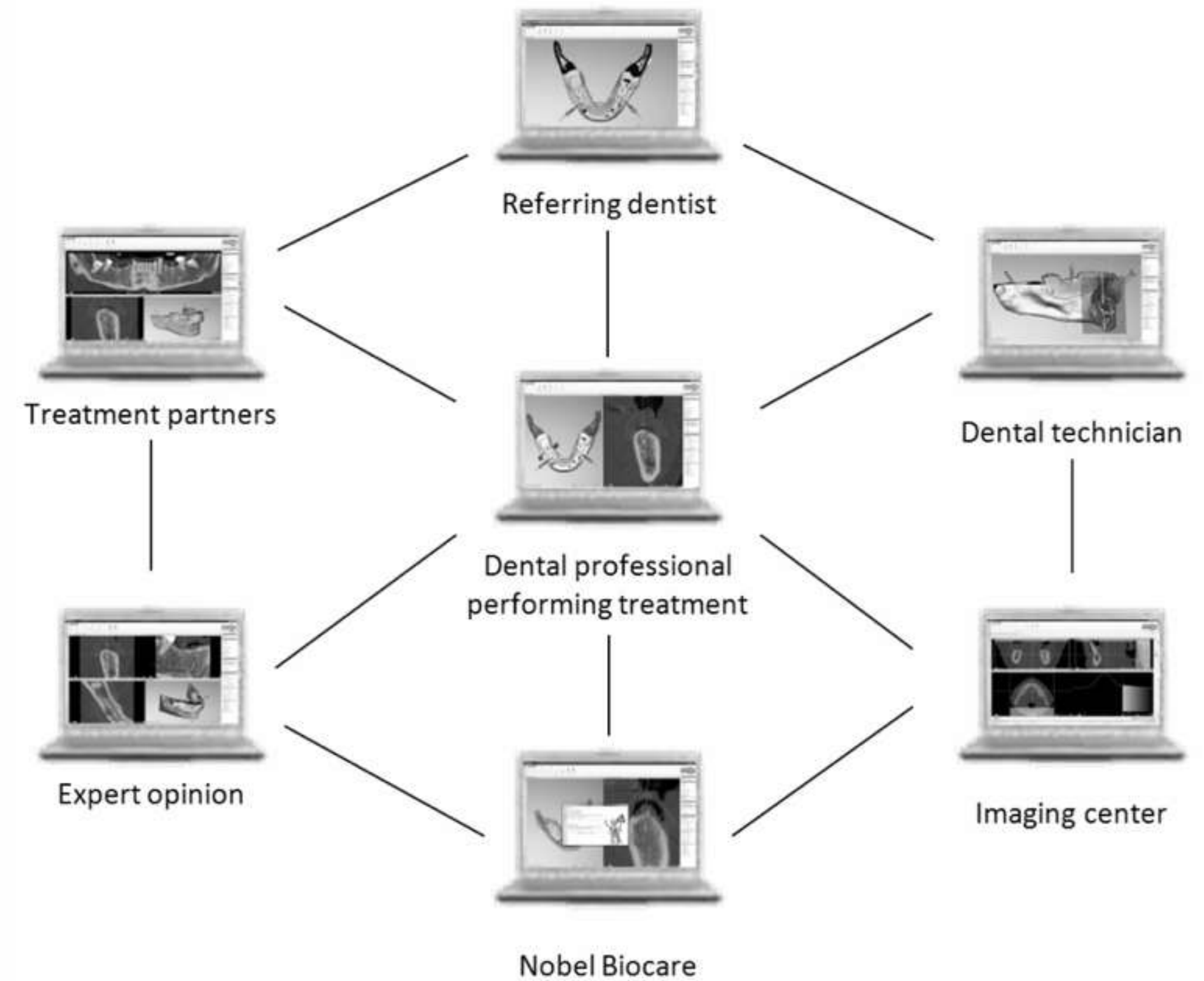


NobelClinician Planning- Virtual Surgery



NobelConnect

- Critical for
Complex
Interdisciplinary
Treatment

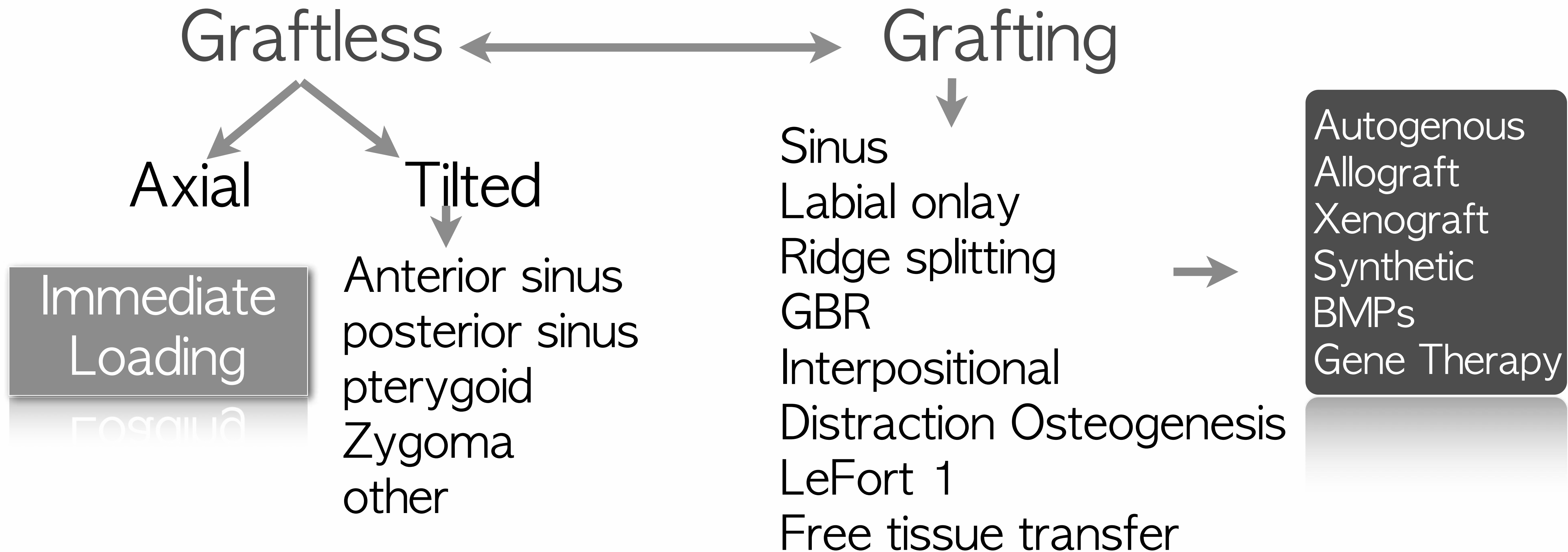




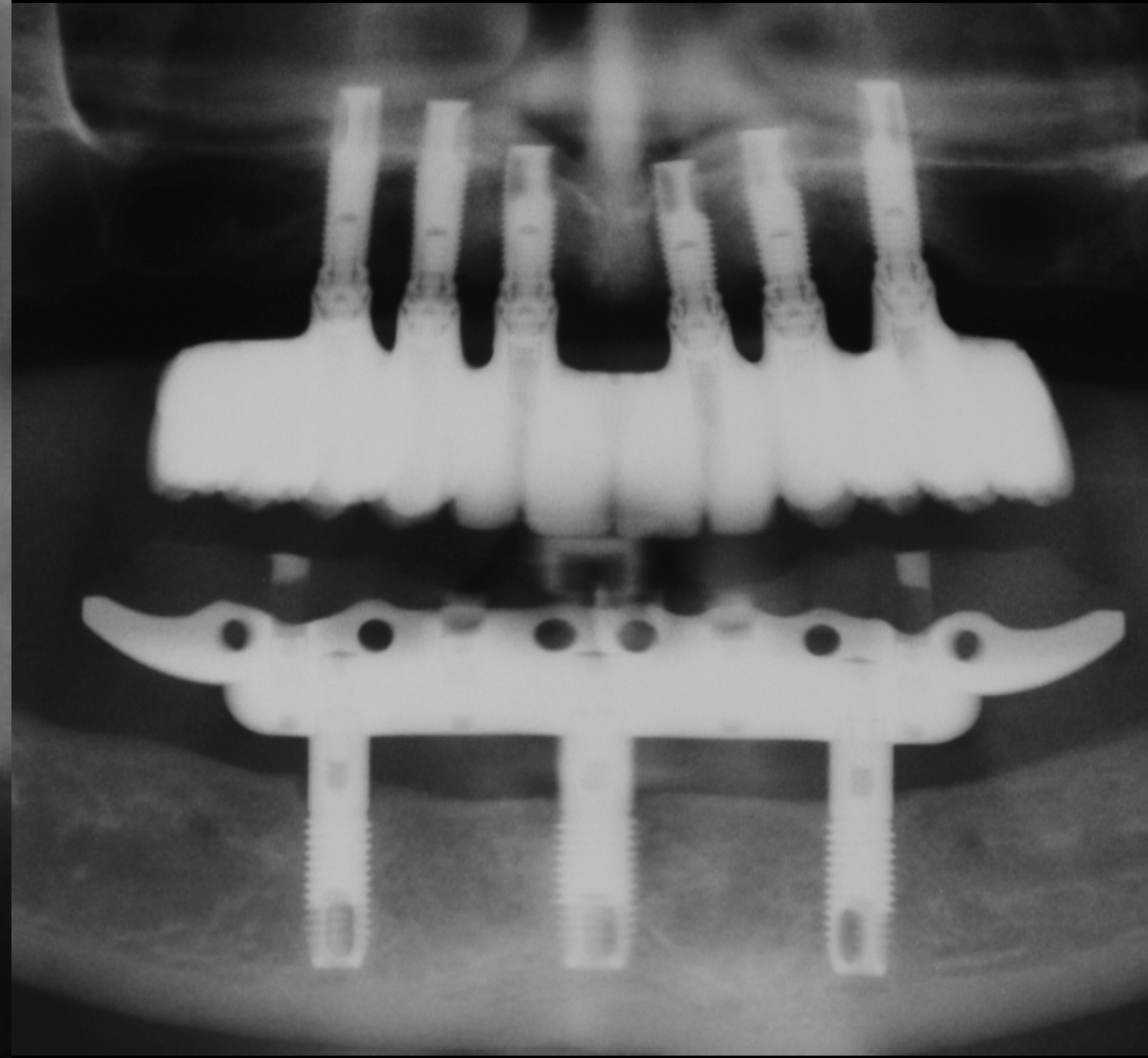
*Implant anchorage is
then prosthetically
directed*



Implant surgical pathways



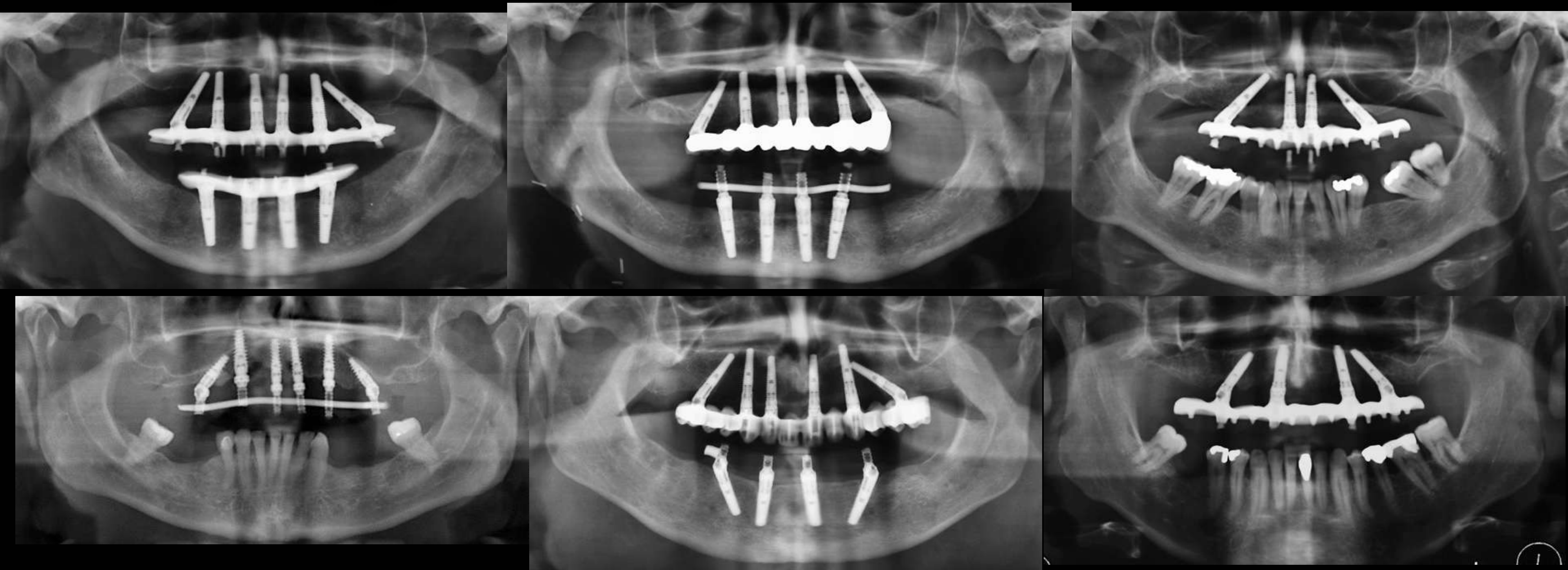
Axial implants no grafting



Studies restoring the edentulous maxilla with fixed prostheses- Axial Implants no grafting

Study	Design	Patients	Implants	Surg Proc	System	FDPs	Obs period	Survival Implants%	Survival FDP %
Adell et al 1981	pros	146	981	Conventional	Branemark	146	9yr	81	89-96
Adell et al 1983	pros	73	529	Conventional	Branemark	73	5- 10	82(5y) 81(10y)	100(5y) 88(10y)
Adell et al 1990	pros	277	1789	Conventional	Branemark	277	5- 15	84(5y) 78(15y)	84(5y) 78(15y)
Carlsson et al 2000	pros	13	75	Conventional	Branemark	13	15	93	-
Jemt et al 2002	pros	58	349	Conventional	Branemark	58	5	91	93
Engfors et al 2004	retro	44	282	Conventional	Branemark	44	5	93	-
Jaffin et al 2004	-	34	236	Immed loading	Straumann	34	5	92	-
Ortop et al 2004	pros	54	356	-	Branemark	54	5	90	95
Degidi et al 2005	retro	45	388	Immed loading	various	45	5	98	-
Rasmussen et al 2005	pros	16	91	Conventional	Astra	16	10	97	100
Cannizzaro et al 2007	pros	33	202	Immed loading	Zimmer	21	1	100	100

Tilted implants no grafting

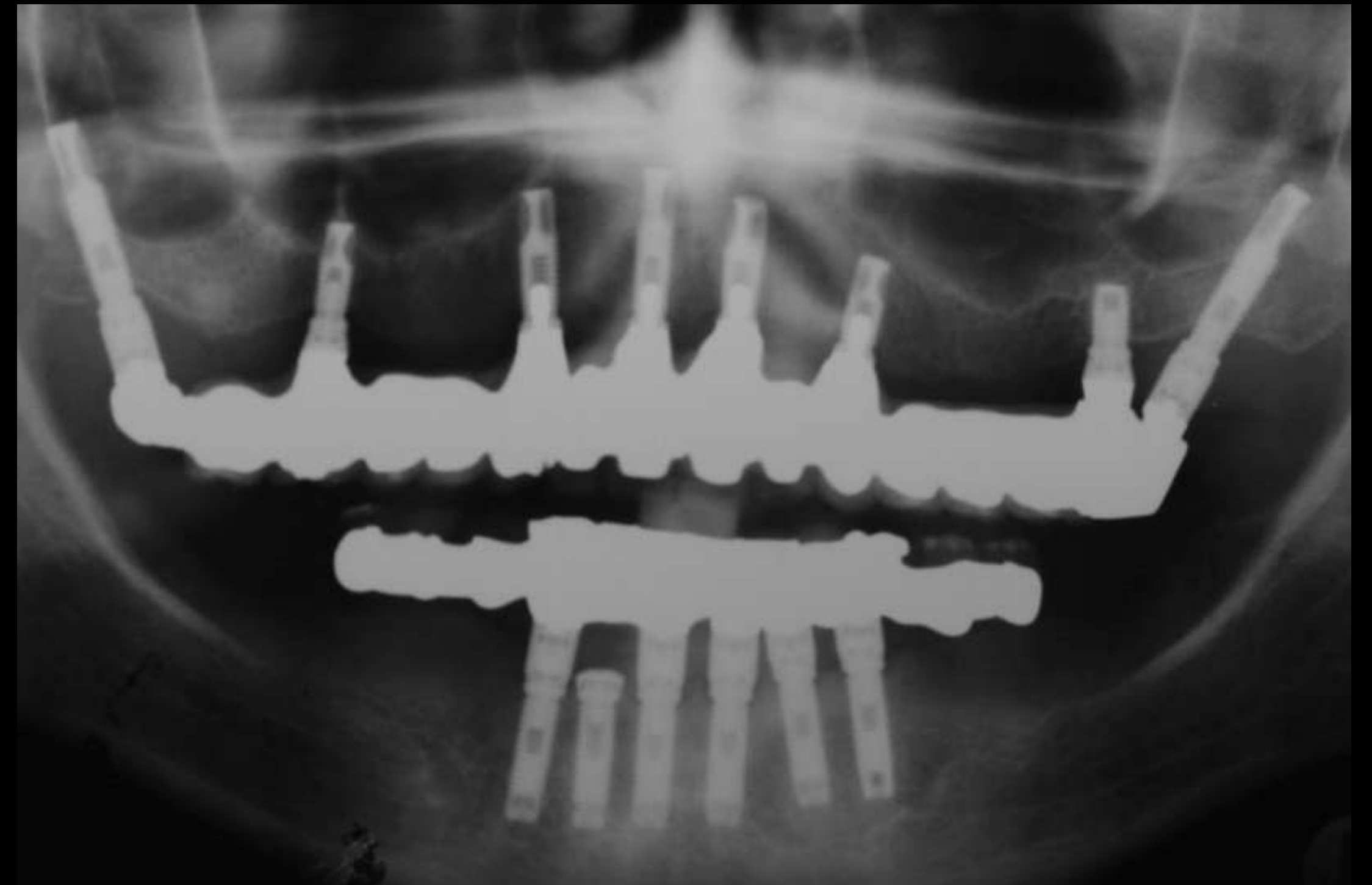


Tilted implants no grafting

Maxilla 13 year follow-up



17 year follow-up



Mandible 24 year follow-up

Studies restoring the edentulous maxilla with fixed prostheses- Tilted implants no grafting

Study	Design	Patients	Implants	Surg Proc	System	FDPs	Obs period	Survival Implants%	Survival FDP %
Mattson et al 1999	pros	15	86	conventional	Branemark	15	3	99	-
Malo et al 2005	retro	32	128	immed loading	Branemark	32	1	98	-
van Steenberghe 2005	pros, multi	27	164	immed loading	Branemark	27	1	100	100
Capelli et al 2007	pros, multi	41	246	immed loading	3i	41	3	98	100
Malo et al 2007	pros	18	72	immed loading	Branemark	18	2	97	-
Rosen et al 2007	retro	19	103	conventional	Branemark	19	8- 12	97	-
Tealdo et al 2008	pros	21	111	immed loading	3i	21	1	93	100
Testori et al 2008	pros	41	246	immed loading	3i	41	1-3	99	100

Del Fabbro M, Bellini CM, Romeo D, Francetti L. Tilted Implants for the Rehabilitation of Edentulous Jaws: A Systematic Review. Clin Implant Dent Relat Res. 2011

Patzelt, Bahat, Reynolds, Strub. The All-on-Four Treatment Concept: A Systematic Review. CIDRR 2014 16;6

Studies restoring the edentulous maxilla with fixed
prostheses- Tilted implants no grafting

No sig difference in failure rate or marginal bone levels between axial and tilted implants

Menini M1, Signori A, Tealdo T, Bevilacqua M, Pera F, Ravera G, Pera P. Tilted implants in the immediate loading rehabilitation of the maxilla: a systematic review. J Dent Res. 2012;91(9):821-7.

Del Fabbro M, Bellini CM, Romeo D, Francetti L. Tilted Implants for the Rehabilitation of Edentulous Jaws: A Systematic Review. Clin Implant Dent Relat Res. 2011

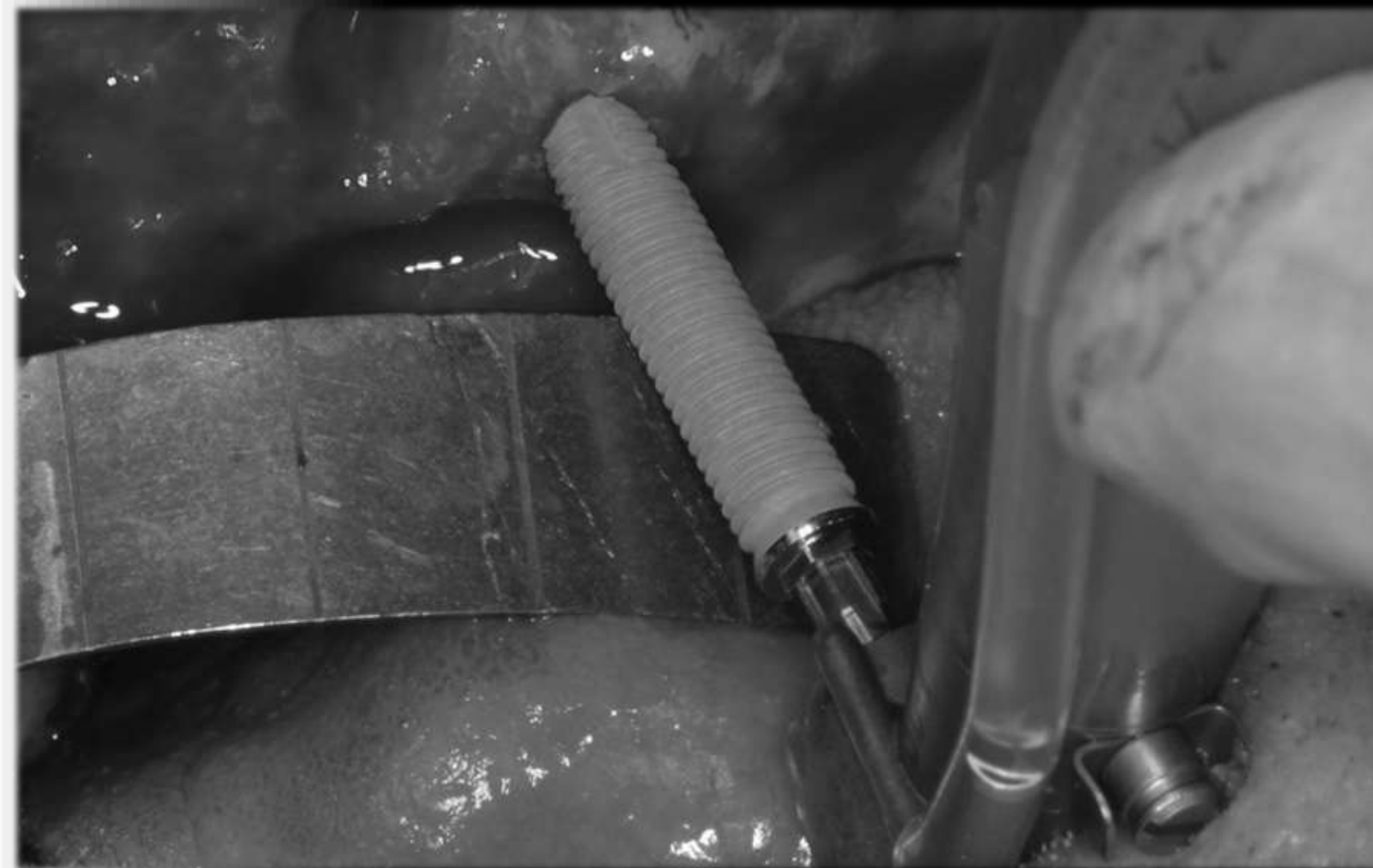
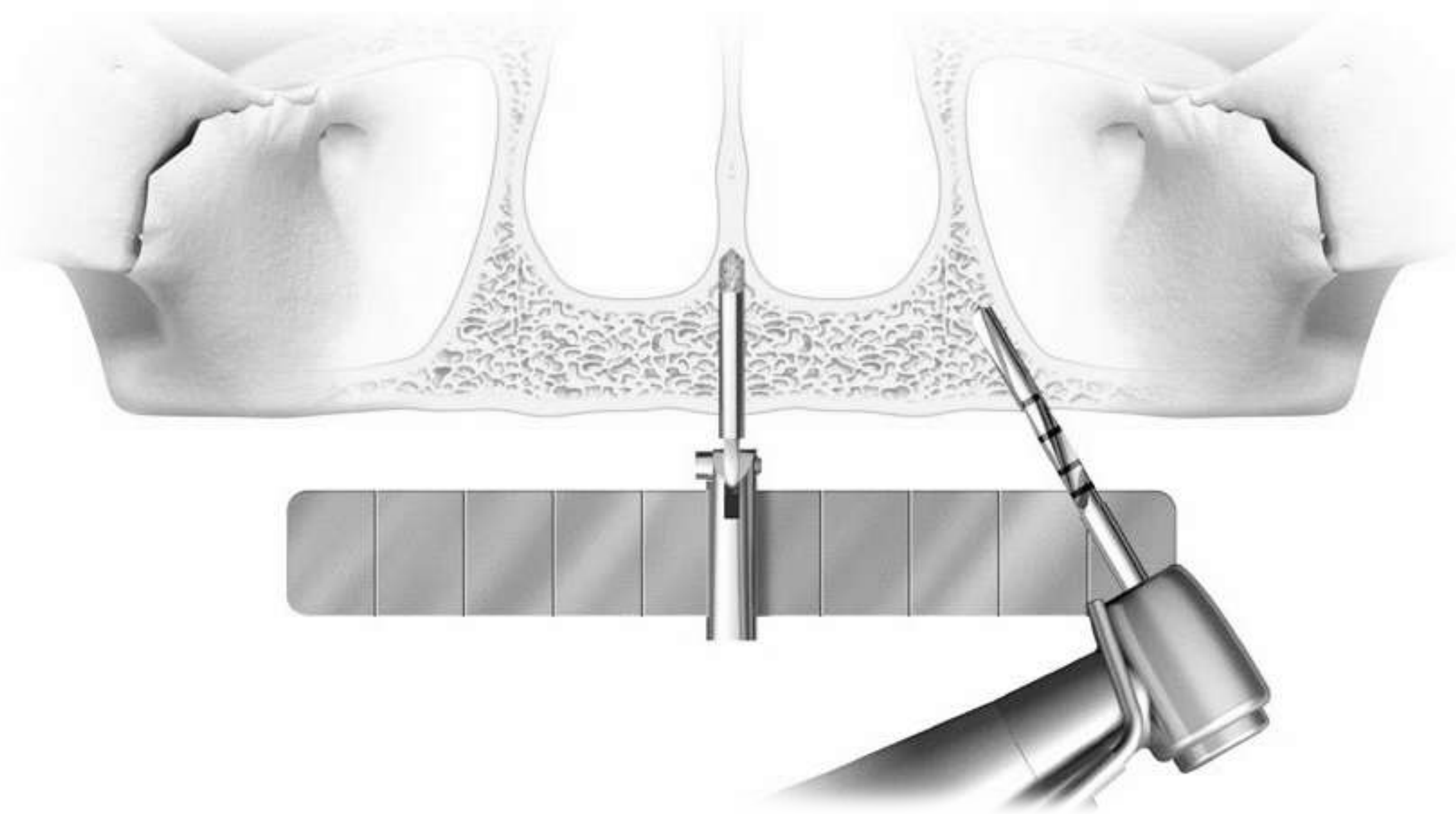
Patzelt, Bahat, Reynolds, Strub. The All-on-Four Treatment Concept: A Systematic Review. CIDRR 2014 16;6

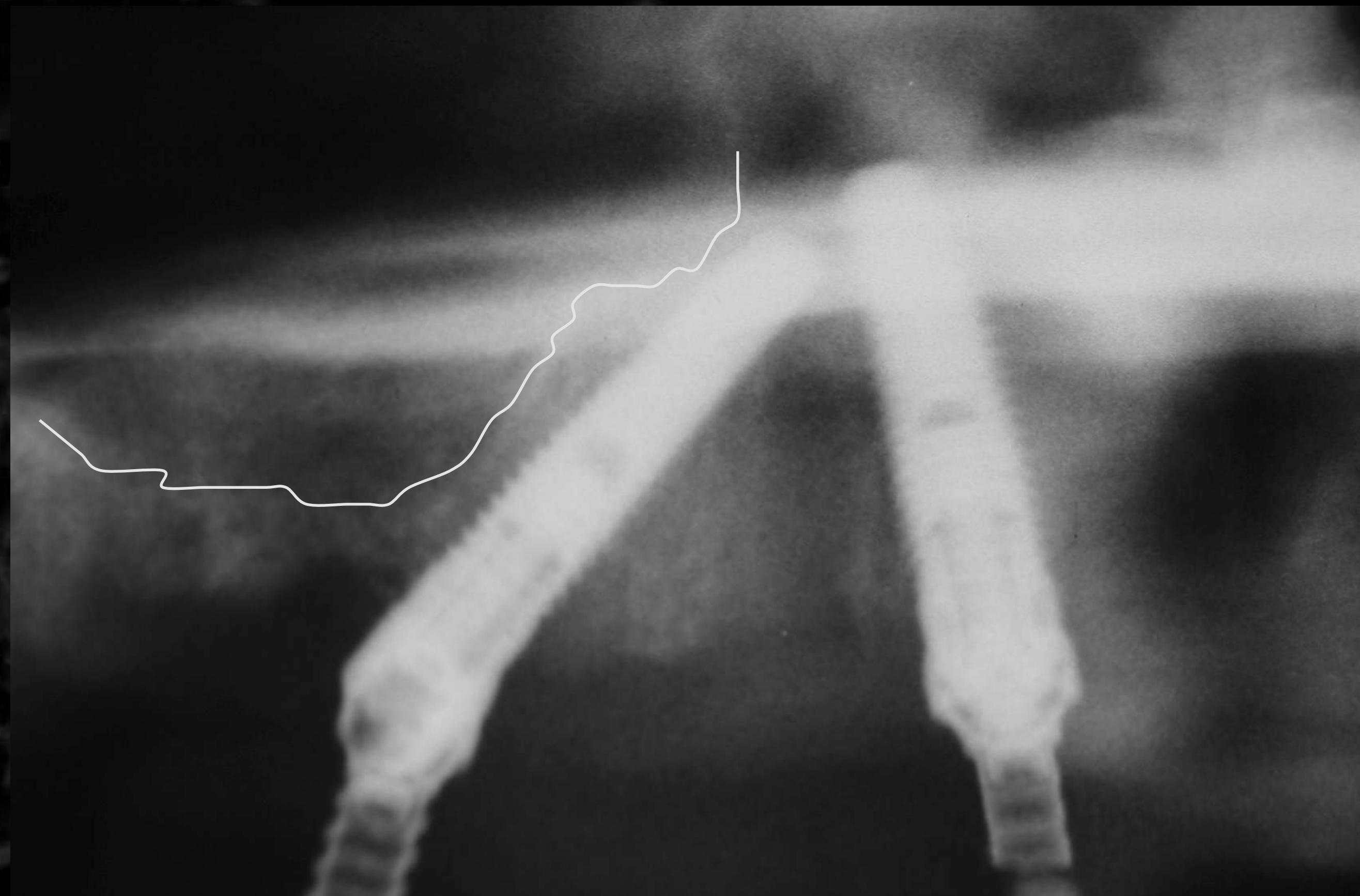
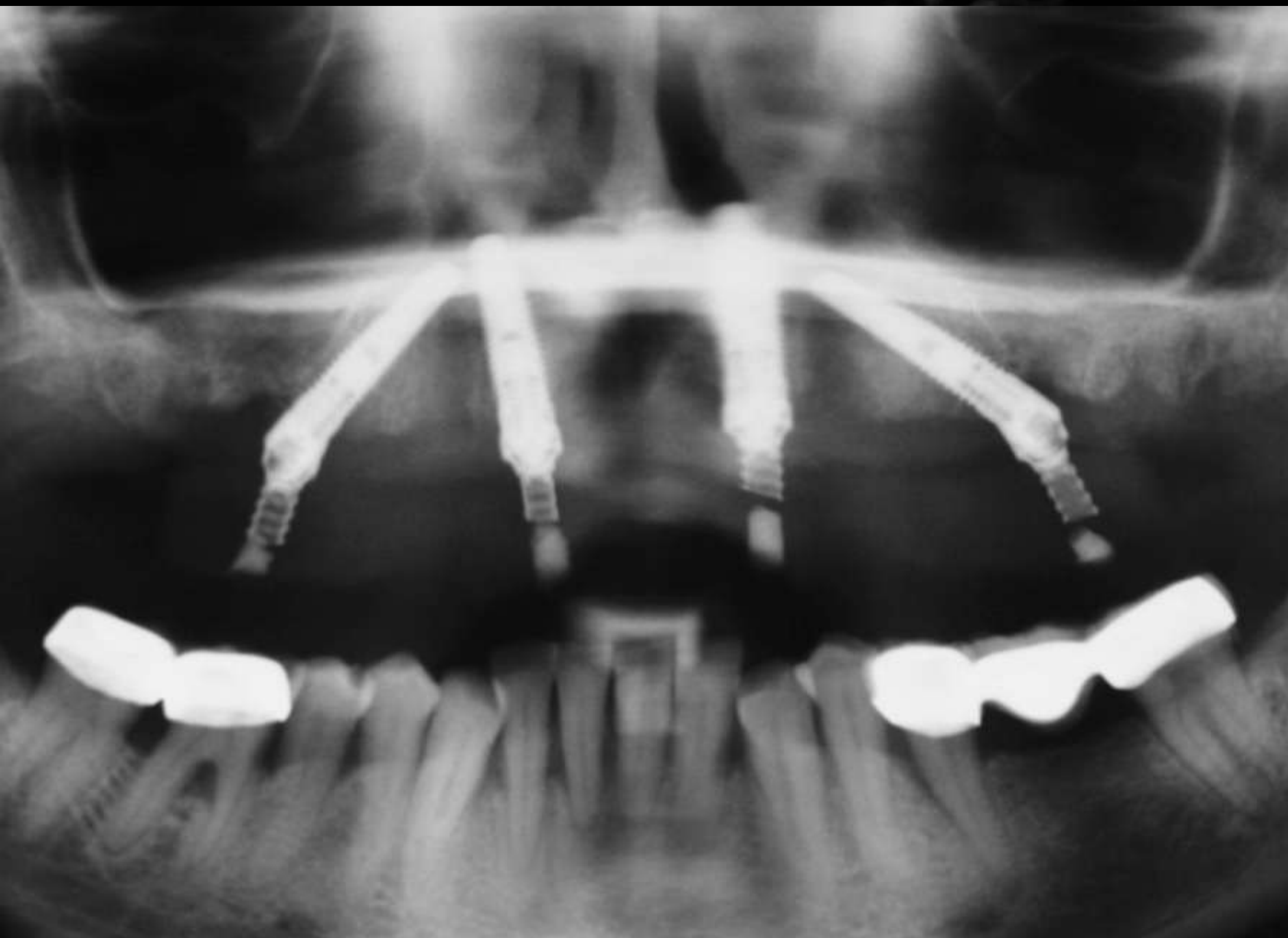
Parel SM, Phillips WR. A risk assessment treatment planning protocol for the four implant immediately loaded maxilla: preliminary findings. J Prosthet Dent. 2011;106(6):359-66.

Maló P, Araújo Nobre MD, Lopes A, Rodrigues R. Double Full-Arch Versus Single Full-Arch, Four Implant-Supported Rehabilitations: A Retrospective, 5-Year Cohort Study. J Prosthodont. 2015;24(4):263-70.

Tilted implants

- Allows for placement of longer implants -immediate loading
- Allows for improved anchorage in dense bone
- Allows for further distal extensions
- Does not have a negative effect on load distribution
- Relatively easier surgery compared to sinus lifting





All-on-4 outcomes

- 20 maxillae 18–42 months prospective single cohort immediate loading
- Implant survival 100%
- Marginal bone loss 0.8 ± 0.4 mm axial, 0.9 ± 0.5 mm
- No stat difference in axial vs tilted implants

Agliardi E, Panigatti S, Clericò M, Villa C, Malò P. Immediate rehabilitation of the edentulous jaws with full fixed prostheses supported by four implants: interim results of a single cohort prospective study. Clin Oral Implants Res. 2010 May; 21(5):459–65.

ALL-on-4 outcomes

- 61 maxillae 1-5yrs prospective single cohort immediate loading
- Implant survival 98.36%
- Marginal bone loss 0.9 ± 0.7 mm
- No difference in axial vs tilted implants

Agliardi EL, Francetti L, Romeo D, Del Fabbro M. Immediate rehabilitation of the edentulous maxilla: preliminary results of a single-cohort prospective study. Int J Oral Maxillofac Implants. 2009 Sep-Oct;24(5):887-95.

All-on-4 outcomes

Systematic Review

- 13 papers
- 4804 implants, 1201 prostheses within 48 hrs
- 99% success at 3 yrs (implants)
- 99.9% success at 3 yrs (prosthesis)
- Bone loss 1.3 ± 0.4 mm at 3 yrs
- No sig diff between axial and tilted implants
- Most failures with smokers and bisphosphonate medication
- Short term results

S. B. M. Patzelt, O Bahat, BDS, M. A. Reynolds, J. R. Strub, The All-on-Four Treatment Concept: A Systematic Review. Clin Oral Impl Res 2013

All-on-6 outcomes

- 41 maxillae mean 22 month follow-up prospective multi-center immediate loading
- 4 axial implants, 2 tilted
- Implant survival 98.8%
- Marginal bone loss $0.9 \pm 0.4\text{mm}$ axial, $0.8 \pm 0.5\text{mm}$ tilted
- No difference in axial vs tilted implants
- Prosthesis success rate 100%

Testori T, Del Fabbro M, Capelli M, Zuffetti F, Francetti L, Weinstein RL. Immediate occlusal loading and tilted implants for the rehabilitation of the atrophic edentulous maxilla: 1-year interim results of a multicenter prospective study. Clin Oral Implants Res. 2008 Mar;19(3):227-32.

ALL-ON-6 outcomes

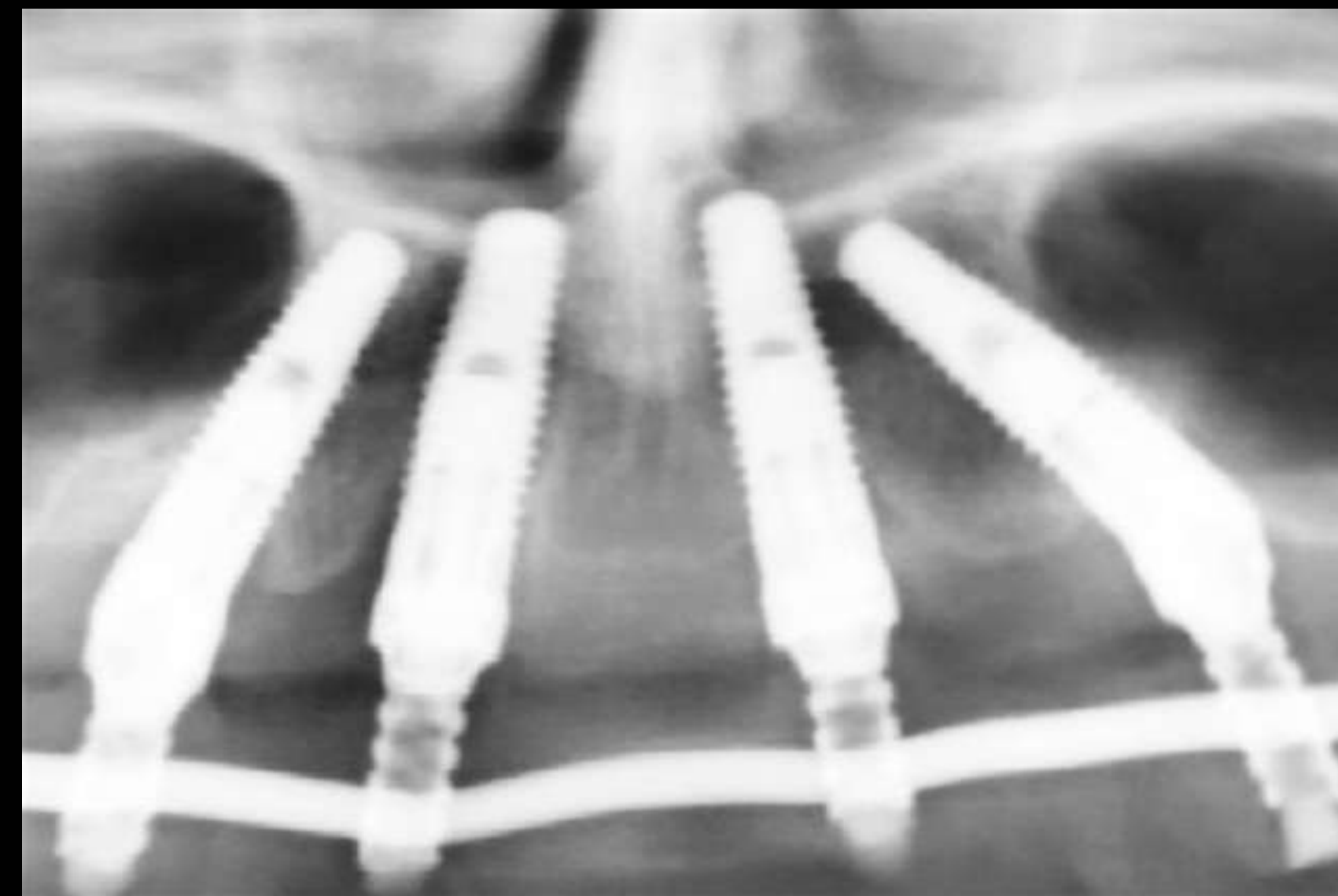
- 19 patients with 4 or 6 implants, tilted distal implants
- 8–12 year follow-up, mean 10 years (pre-All-on-4)
- Implant success 97%
- Marginal bone loss 1.2mm
- No difference in axial vs tilted implants

Rosén A, Gynther G. Implant treatment without bone grafting in edentulous severely resorbed maxillas: a long-term follow-up study. J Oral Maxillofac Surg. 2007 May;65(5):1010–6.

Implant Failure

Multifactorial reasons for bone loss

- cause/effect/association
- Early failure
- Late failure
 - Periimplantitis model
 - Patient related factors
 - Due to inadequate healing in the first place -lower BIC - degree of sustainable osseosufficiency



Koka S, Zarb G. On osseointegration: The healing adaptation principle in the context of osseosufficiency, osseoseparation and dental implant failure. Int J Pros 2012;25:48-52.

Zarb G. Implantomania: Prosthodontics at a crossroads. Int J Pros 2012;25:180-185.

Albrektsson T, Buser D, Sennerby L. On crestal/marginal bone loss around dental implants. Int J Pros 2012;25:320-322.

Members - T Albrektsson, D Buser, S Chen, D Cochran, H De Bruyn, T Jemt, S Koka, M Nevins, L Sennerby, M Simion, T Taylor, A Wennerberg.

Patient At Risk..

Primary Factors

- Opposing Natural Dentition
- Poor Bone Density
- Bruxer
- Male

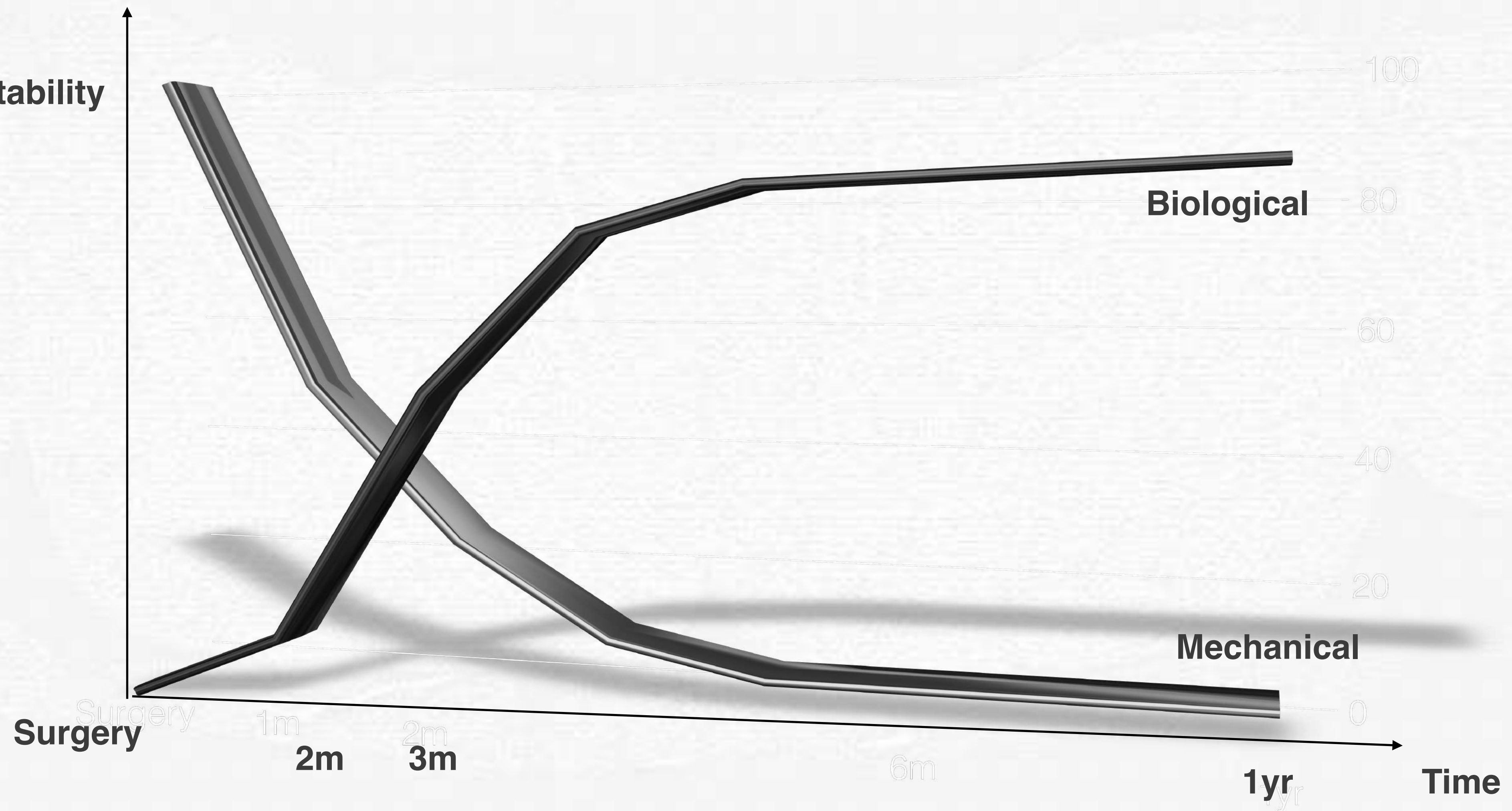
Secondary Factors

- Smoker
- Bone Volume

Patzelt, Bahat, Reynolds, Strub. The All-on-Four Treatment Concept: A Systematic Review. CIDRR 2014 16;6

Parel SM, Phillips WR. A risk assessment treatment planning protocol for the four implant immediately loaded maxilla: preliminary findings. J Prosthet Dent. 2011; 106(6): 359-66.

At Risk..

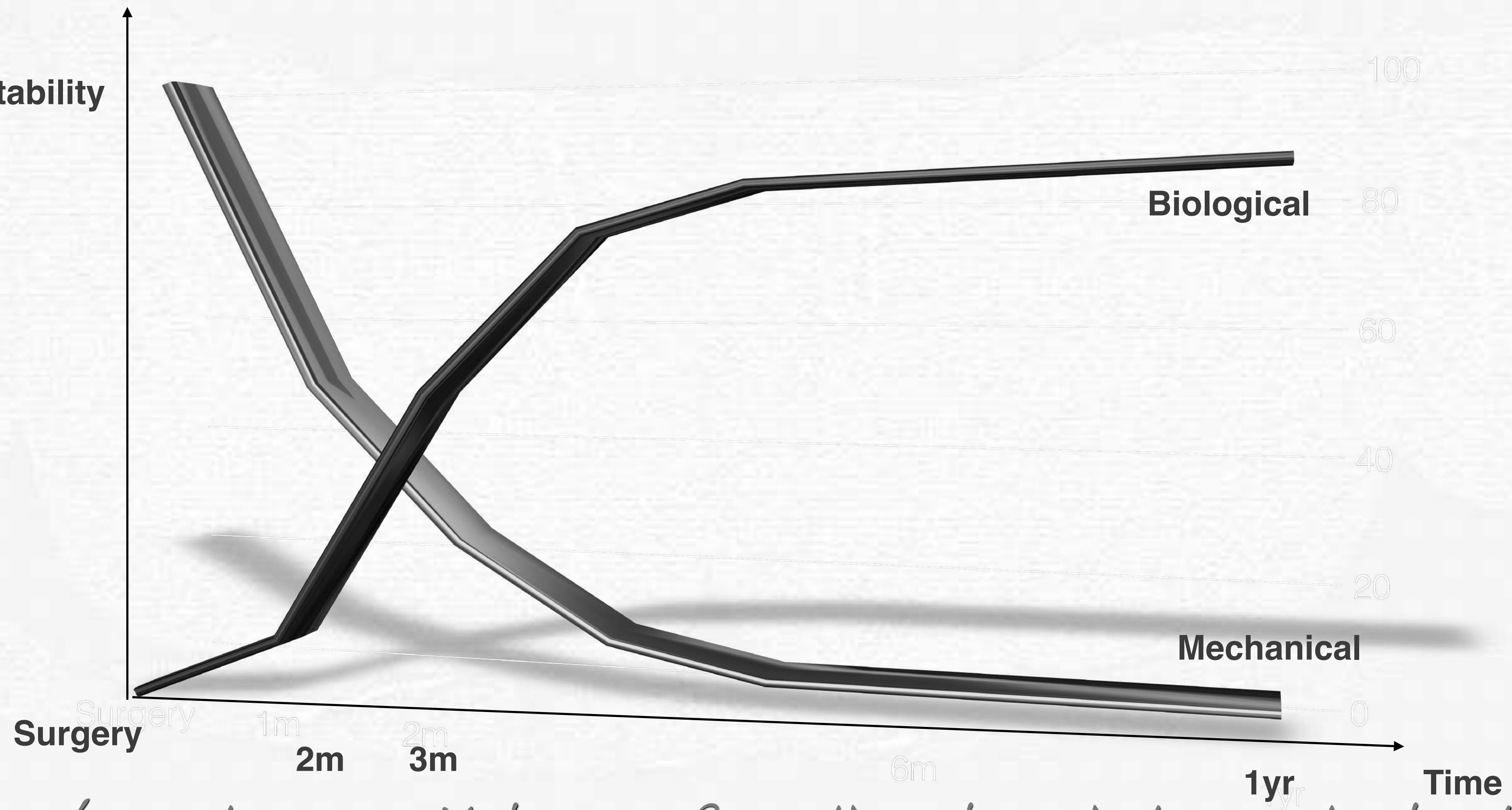


74% of failures occurred within 12 months of placement

Patzelt, Bahat, Reynolds, Strub. The All-on-Four Treatment Concept: A Systematic Review. CIDRR 2014 16;6

Parel SM, Phillips WR. A risk assessment treatment planning protocol for the four implant immediately loaded maxilla: preliminary findings. J Prosthet Dent. 2011; 106(6): 359-66.

At Risk..

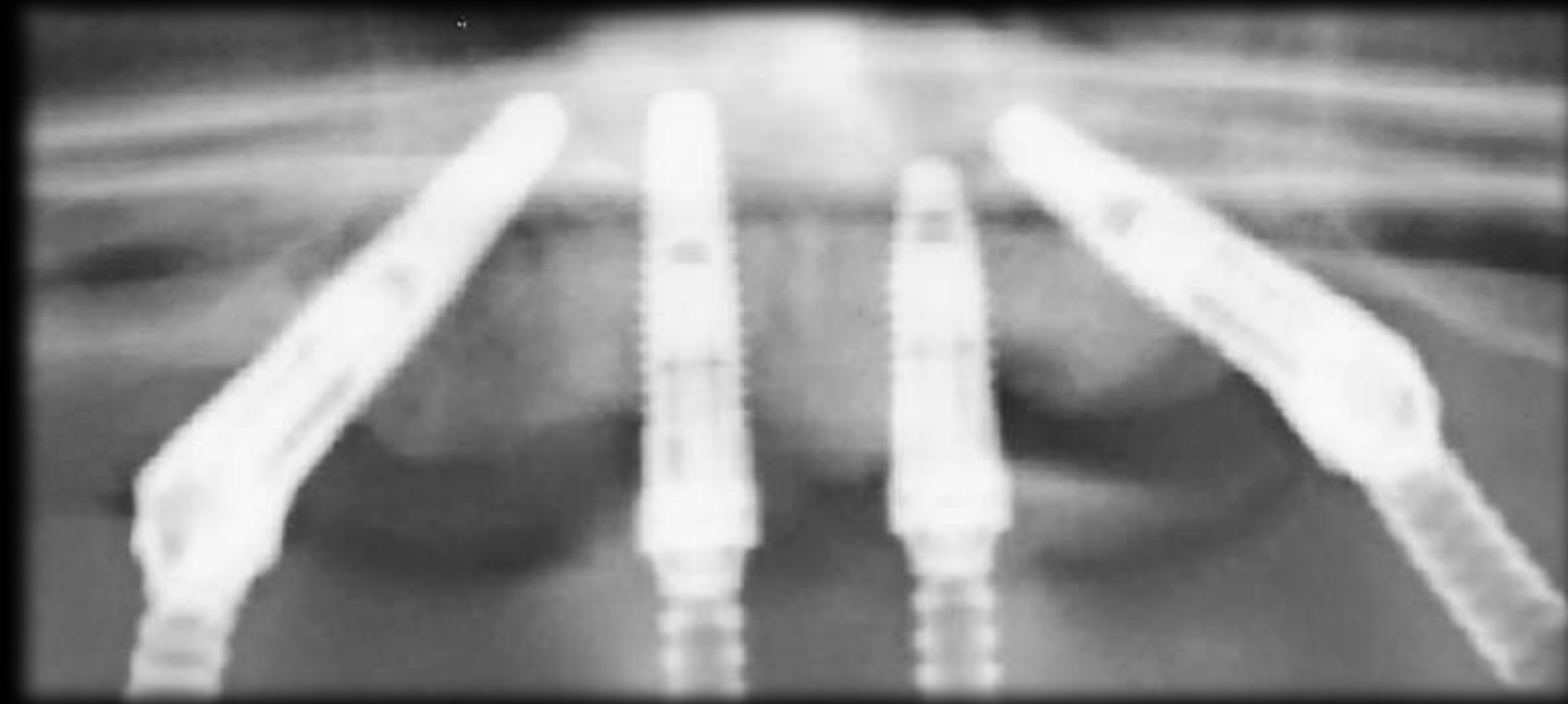


Maxillary bone type 3-4X lower functional resistance to load - implants not as stable cf mandibular bone.

Patzelt, Bahat, Reynolds, Strub. The All-on-Four Treatment Concept: A Systematic Review. CIDRR 2014 16;6

Parel SM, Phillips WR. A risk assessment treatment planning protocol for the four implant immediately loaded maxilla: preliminary findings. J Prosthet Dent. 2011;106(6): 359-66.

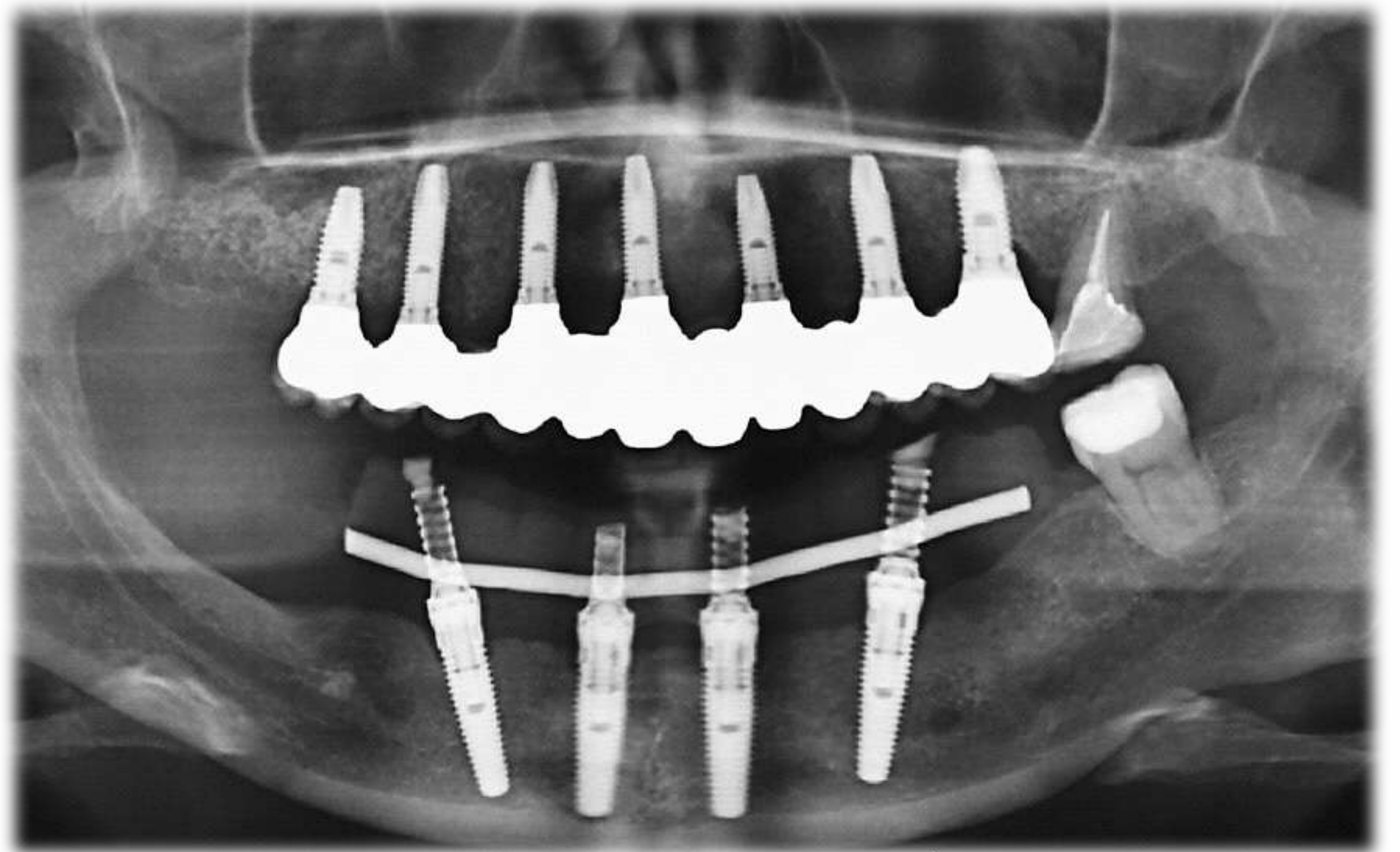
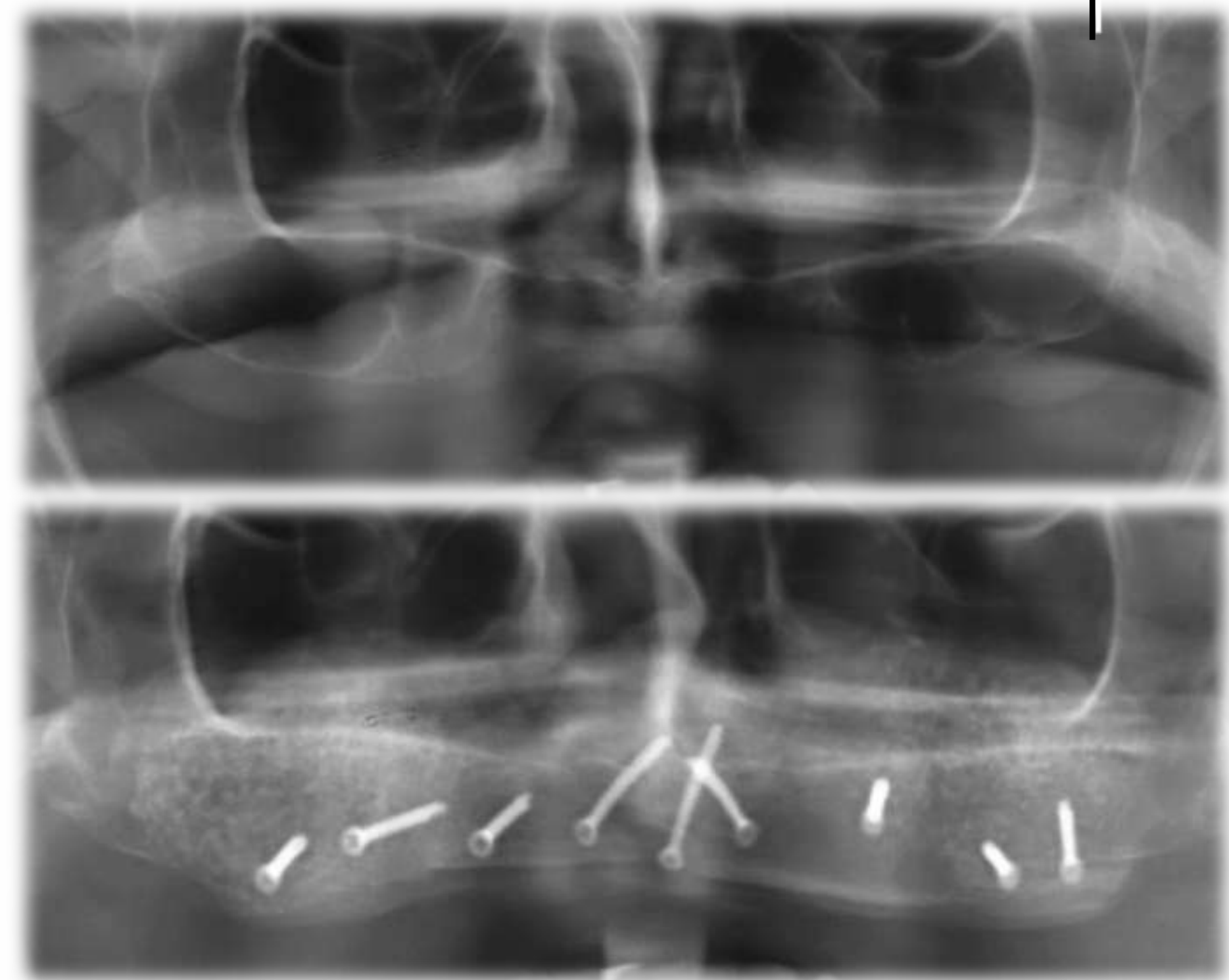
Implant Failure



- Depending on the loading four implants may be insufficient for complete stability resulting in lower BIC and greater susceptibility to integration breakdown , opportunistic infection and bone loss.
- Exacerbated if other pt factors eg smoking, diabetes , IL- 1 phenotype , hx of perio, AI disease etc
- All-on-4 may not be appropriate for larger arch form and greater load.

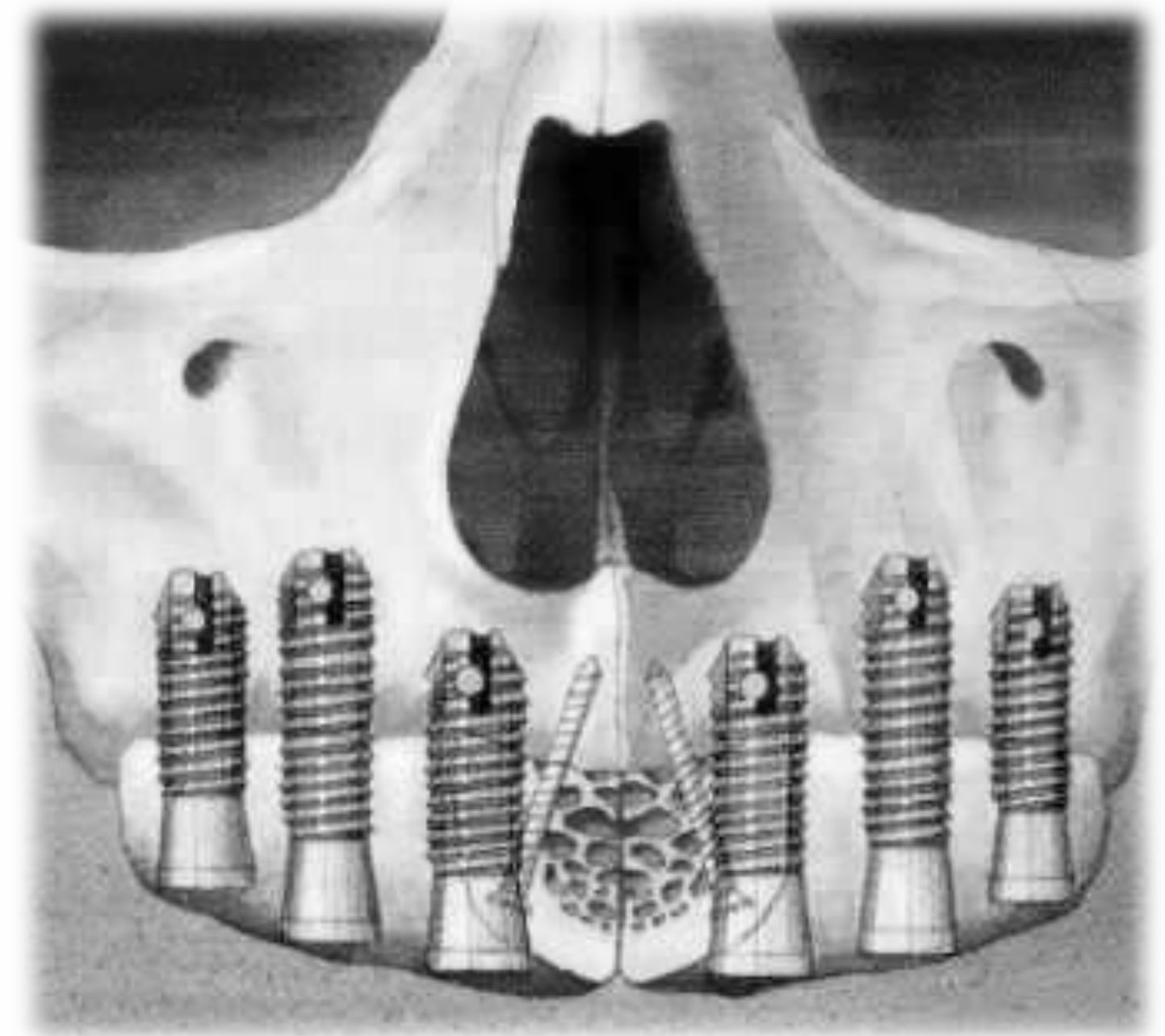
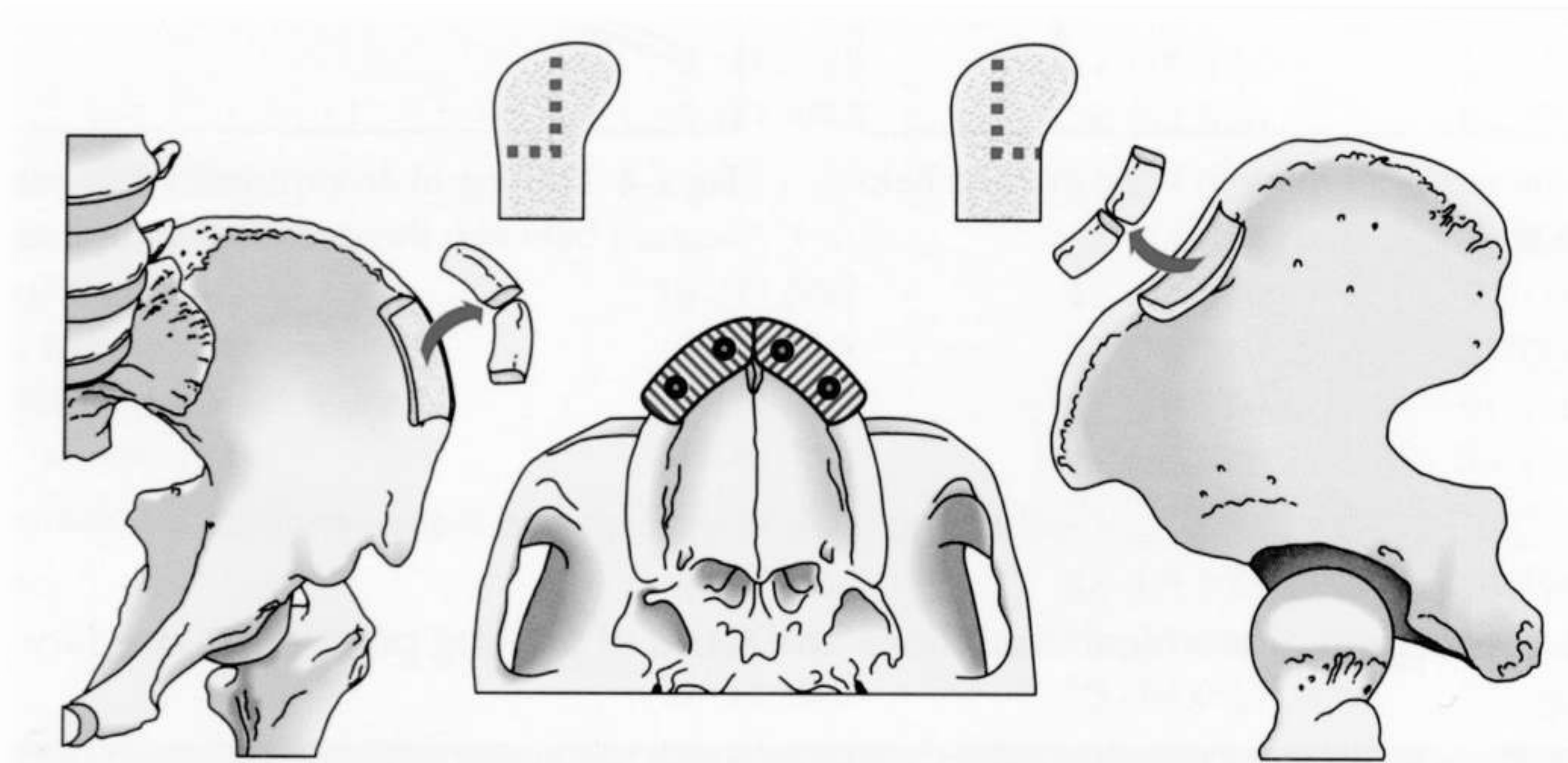
Chung S, McCullagh A, Irinakis T. Immediate loading in the maxillary arch: evidence-based guidelines to improve success rates: A review. J Oral Implantol. 2011;37:610-21.

Management of the Atrophic Maxilla



AUGMENTATION

Iliac Crest grafting



Maxillary Bone Graft

Considerations

Donor site

Recipient site preparation

Fixation

Implant installation delayed -vs- immediate

Post graft radiological requirements

Complications

MINIMUM 1 YEAR TREATMENT PLAN

Studies restoring the edentulous maxilla with fixed prostheses- Sinus Lift Lateral Window

Study	Design	Patient s	Implant s	Surg Proc	System	Graft material	FDPs	Obs period	Survival Implants	Survival FDP %
Watzek et al 1998	retro	20	145	conventional	Frialit, IMZ	Autogenous	5	1-6	95	-
Johansson et al 1999	retro	39	131	immed load	Branemark	Autogenous HA	36	3	75	95
Wannfors et al 2000	RCT	40	150	immed & conventional	Branemark	Autogenous	40	1-6	84	-
Raghoobar et al 2001	retro	75	326	immed & conventional	Branemark	Autogenous	27	1-10	91	-
Hallman et al 2002	pros	21	67	conventional	Branemark	Autogenous, BiOss	21	1	82	-
Bektor et al 2004	retro	64	437	immed & conventional	Branemark	Autogenous	56	5-6	75	100

Systematic Reviews of Studies restoring the edentulous maxilla with fixed prostheses Sinus Lift Lateral Window

- Implant survival more variable in augmented sinuses (36-100% Av ~90%)
- Amount of residual bone height important prognostic factor
- No evidence for the superiority of Autogenous bone compared to substitutes
- Heterogenous studies do not allow definitive statements

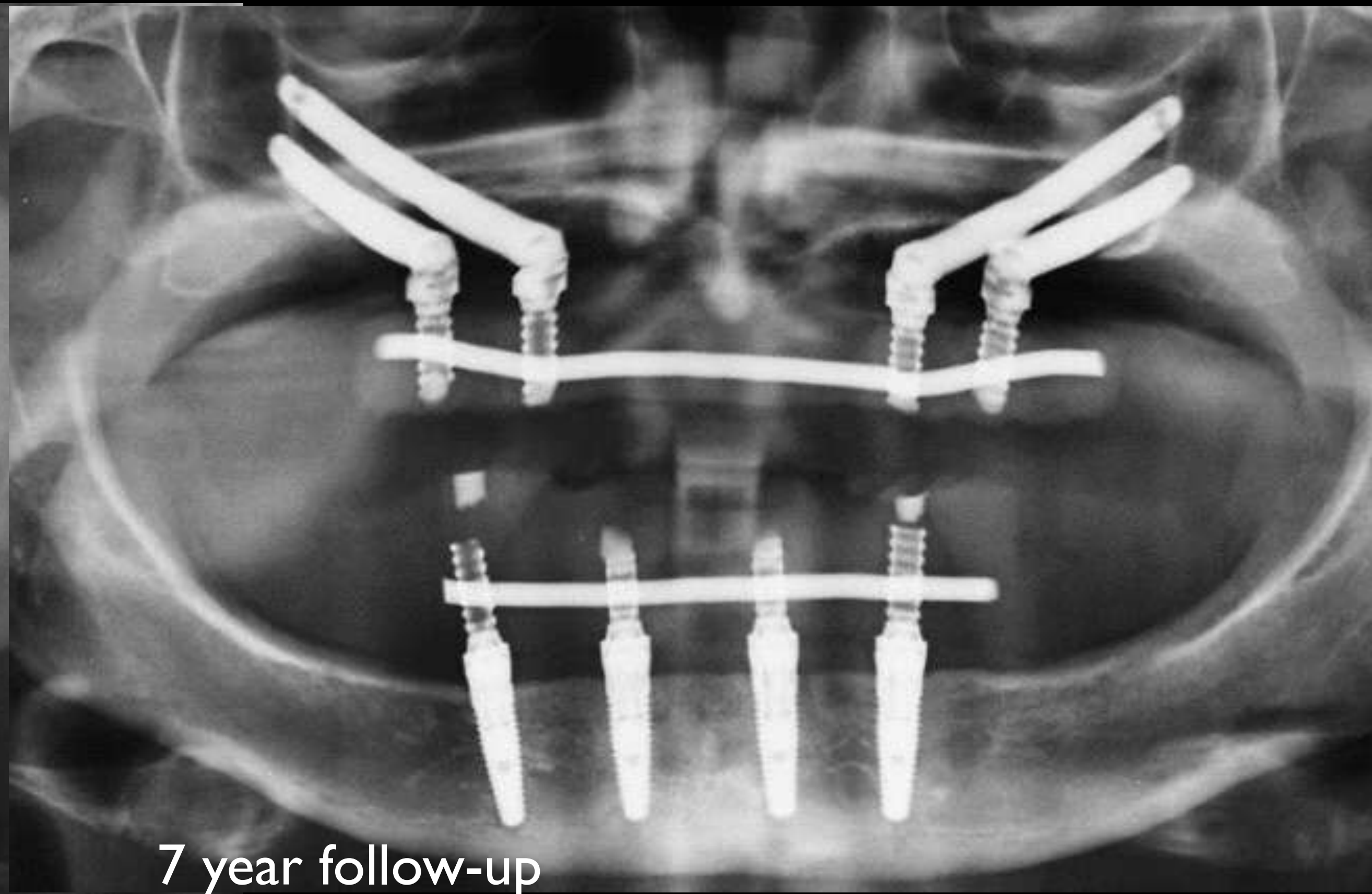
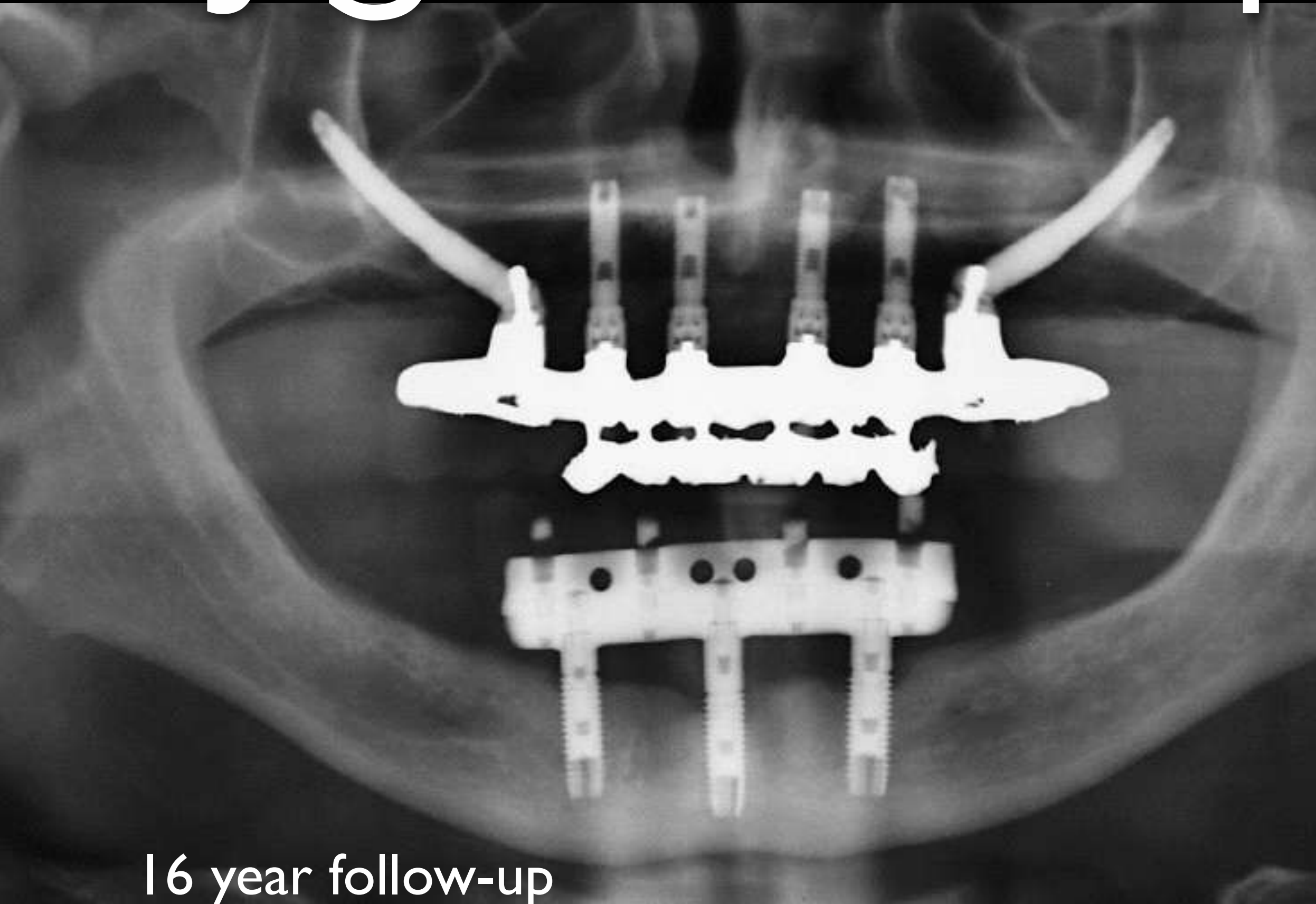
Graziani F, Donos N, Needleman I, Gabriele M, Tonetti M. Comparison of implant survival following sinus floor augmentation procedures with implants placed in pristine posterior maxillary bone: a systematic review. Clin. Oral Impl. Res. 15, 2004; 677–682

Pjetursson BE1, Tan WC, Zwahlen M, Lang NP. A systematic review of the success of sinus floor elevation and survival of implants inserted in combination with sinus floor elevation. J Clin Periodontol. 2008;35(8 Suppl):216–40.

Nkenke E, Stelzle F. Clinical outcomes of sinus floor augmentation for implant placement using autogenous bone or bone substitutes: a systematic review. Clin Oral Implants Res. 2009;20 Suppl 4:124–33.

Rickert D1, Slater JJ, Meijer HJ, Vissink A, Raghoobar GM. Maxillary sinus lift with solely autogenous bone compared to a combination of autogenous bone and growth factors or (solely) bone substitutes. A systematic review. Int J Oral Maxillofac Surg. 2012;41(2):160–7.

Zygoma Implants



Studies restoring the edentulous maxilla with fixed prostheses- Zygoma implants

Study	Design	Patients	Zyg Implants	Surg Proc	System	FDPs	Obs period (yrs)	Survival Implants%	Survival FDP %
Vrielinck et al 2003	Pros	29	67	conventional	Branemark	10	1	93	-
Branemark et al 2004	Pros	28	52	conventional	Branemark	27	5-10	94	96
Hirsch et al 2004	Pros	66	124	conventional	Branemark	58	1	98	97
Malevez et al 2004	Retro	55	103	conventional	Branemark	55	4	100	-
Becktor et al 2005	Retro	16	31	conventional	Branemark	16	1-6	90	-
Ajlgren et al 2006	Pros	13	25	conventional	Branemark	4	1-4	100	-
Bredrossian et al 2006	Pros	14	28	immed loading	Branemark	14	1-4	100	100
Farzad et al 2006	Pros	11	22	conventional	Branemark	11	1-4	100	-
Davo et al 2007	Retro	18	36	immed loading	Branemark	18	1	100	100
Duarte et al 2007	Pros	12	48	immed loading	Branemark	12	2.5	96	-
Penarrocha et al 2007	Retro	21	40	conventional	Branemark	21	1-4	100	-
Bredrossian et al 2010	Pros	36	74	conv/immed	Branemark	36	7	97.3	100
Miglioranca et al 2012	Pros	25	40	immed loading	Branemark	25	8	97.5	95.2
Aparicio et al 2014	Retro	22	41	conventional	Branemark	22	10	97.7	100
Davo et al 2013	Pros	42	69	immed loading	Branemark	37	5	98.5	100
Malo et al 2014	Retro	39	92	immed loading	Branemark	39	5	98.8	100
Davo et al 2015	Pros	14	64	immed loading	Branemark	14	5	100	100

Systematic reviews

- Overall survival rate 96.7% including cancer patients
- Intramaxillary immediate loaded (9 Studies, 458 implants, 8 failures) ZI 98.3%
- 5 cases of sinusitis, all resolved

Chrcanovic BR, Abreu MH. Survival and complications of zygomatic implants: a systematic review. Oral Maxillofac Surg. 2013;17(2):81-93.

Systematic reviews

- 25 articles
- Overall survival rate 97.8% (1541 ZI, 33 failures)
- Failure generally in the first year due to infection and sinusitis

Goiato MC, Pellizzer EP, Moreno A, Gennari-Filho H, Dos Santos DM, Santiago JF Jr, Dos Santos EG. Implants in the zygomatic bone for maxillary prosthetic rehabilitation: a systematic review. Int J Oral Maxillofac Surg. 2014;43:748-757. Review.

Satisfaction Studies

- 16 pts
- All satisfied, 50% with some complaints (50% prosthesis, 38% implants)
- 22 pts
- 84% satisfaction above 80% (32% had 100% satisfaction)
- Satisfaction (high) approaching the general population

Sartori et al Evaluation of Patients Rehabilitated with Zygomatic Fixtures. J Oral Maxillofac Surg 2012; 70:314-9.

Aparicio et al The Long Term Use of Zygomatic Implants: A 10 Year Clinical and Radiographic Report. Clin Impl Dent Relat Res 2012

Wang F, Monje A, Lin GH, Wu Y, Monje F, Wang HL, Davó R. Reliability of four zygomatic implant-supported prostheses for the rehabilitation of the atrophic maxilla: A systematic review IJOMI 2015;30:293-298.

Treatment Planning Guidelines

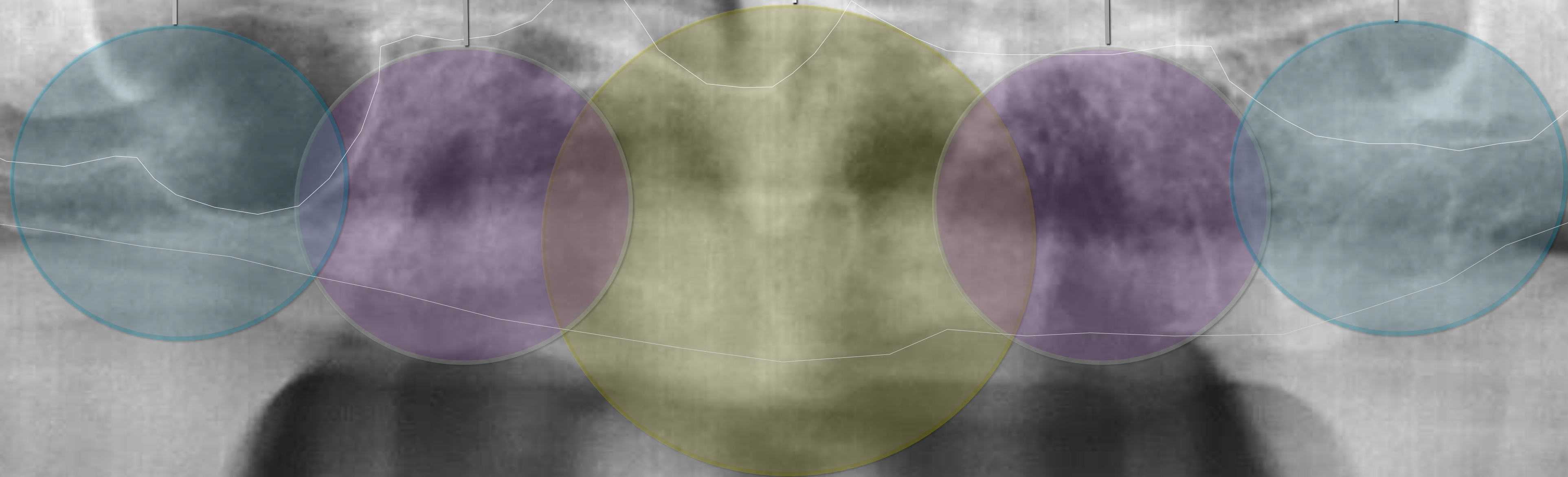
Zone 1

Zone 2

Zone 2

Zone 3

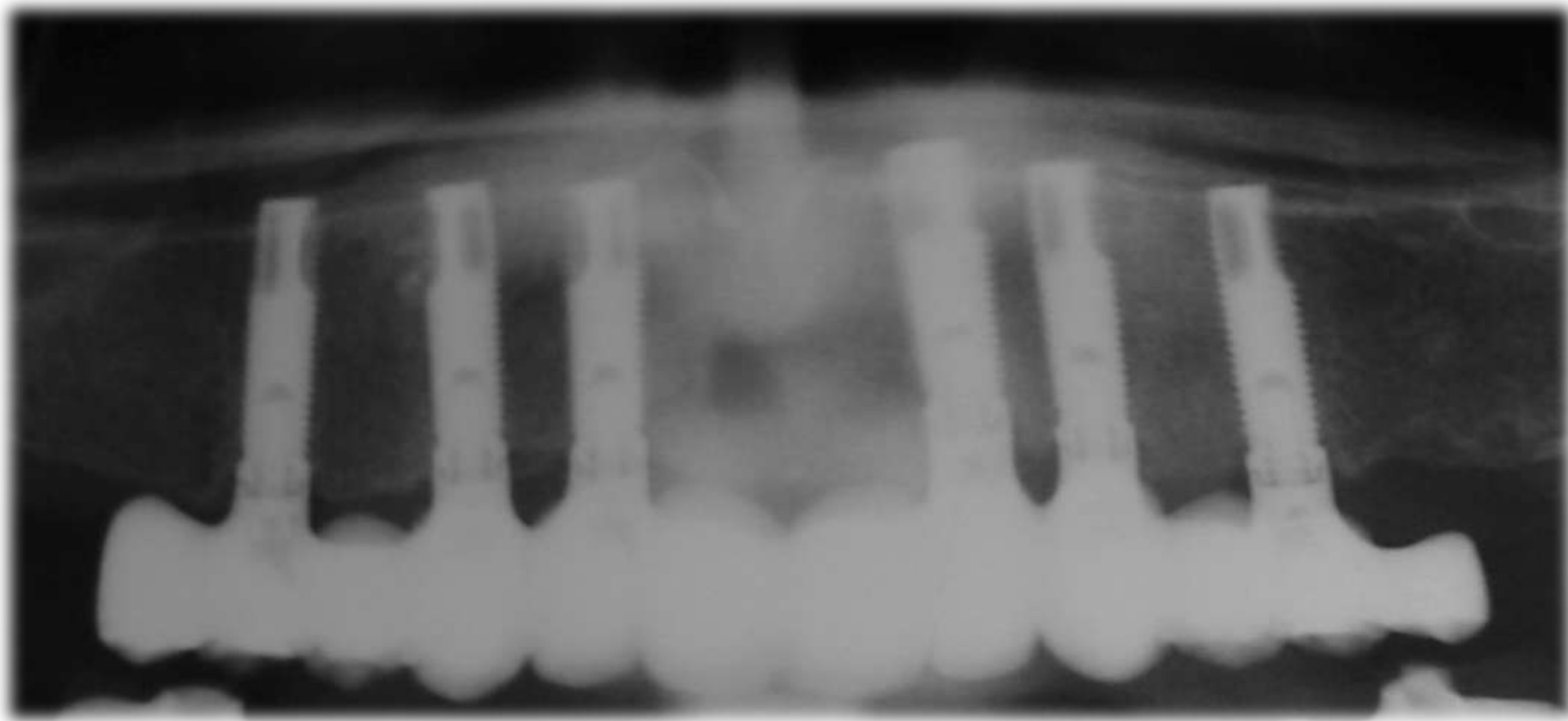
Zone 3



Bedrossian E. Rehabilitation of the edentulous maxilla with the zygoma concept: A 7-year prospective study IJOMI 2010:25;1213-1221

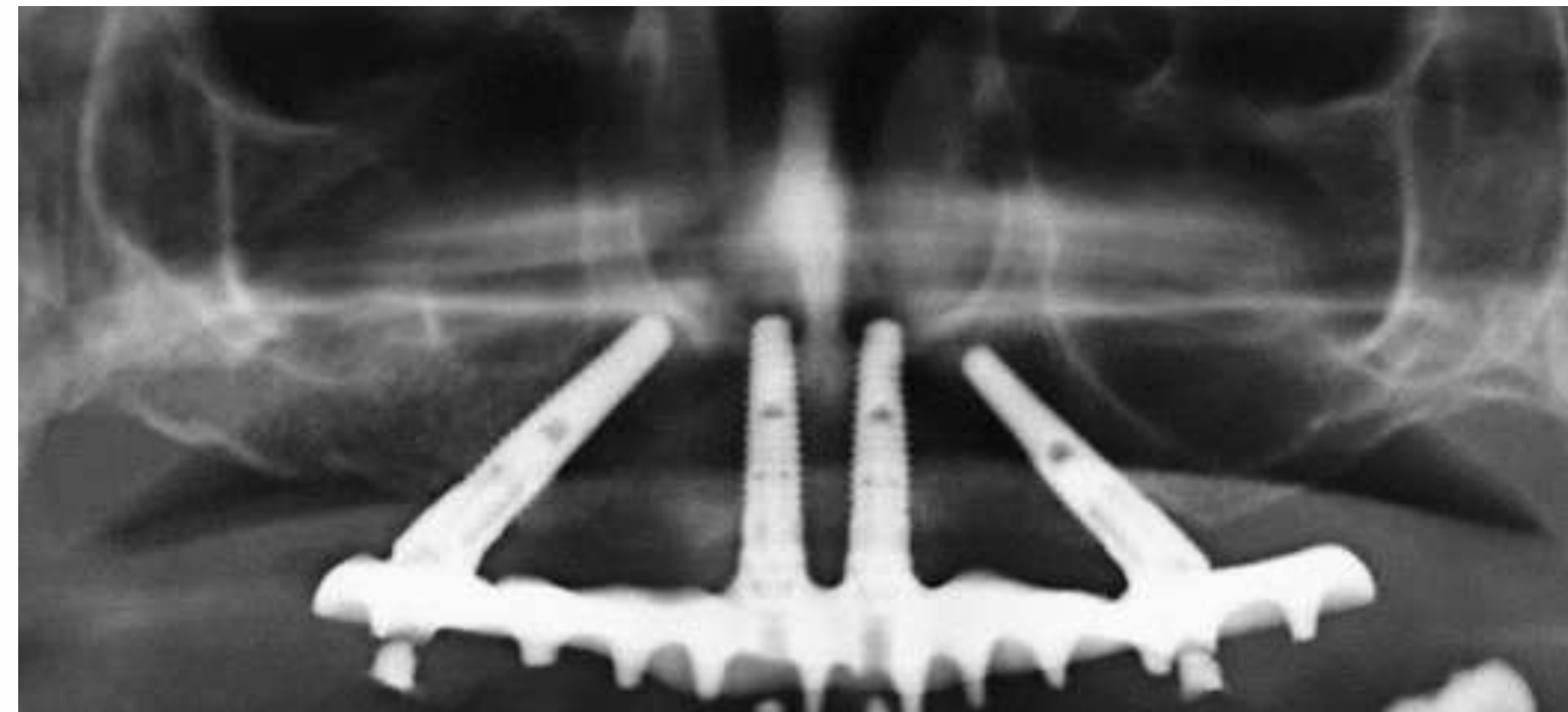
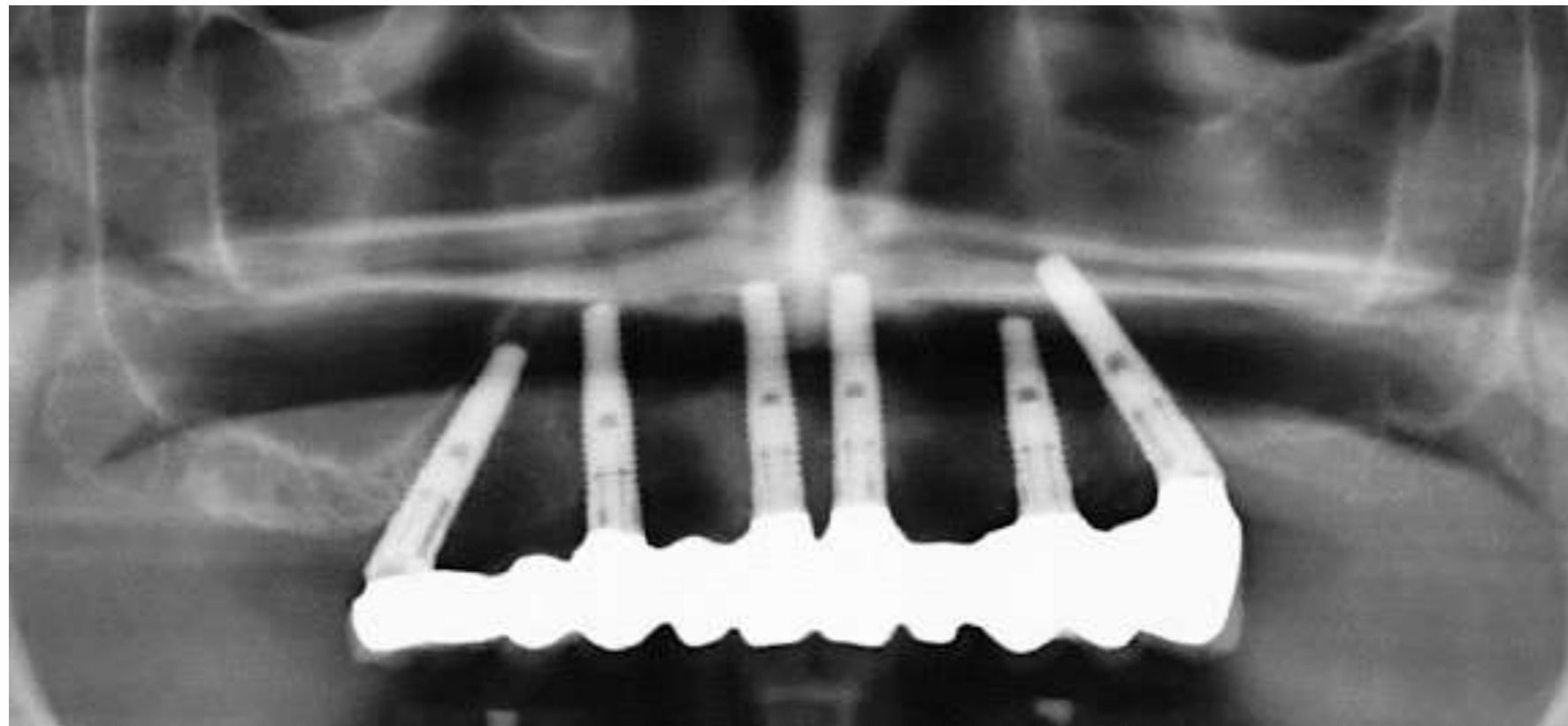
Treatment Planning Guidelines

Zones 1,2 &3 - Traditional Axial implants



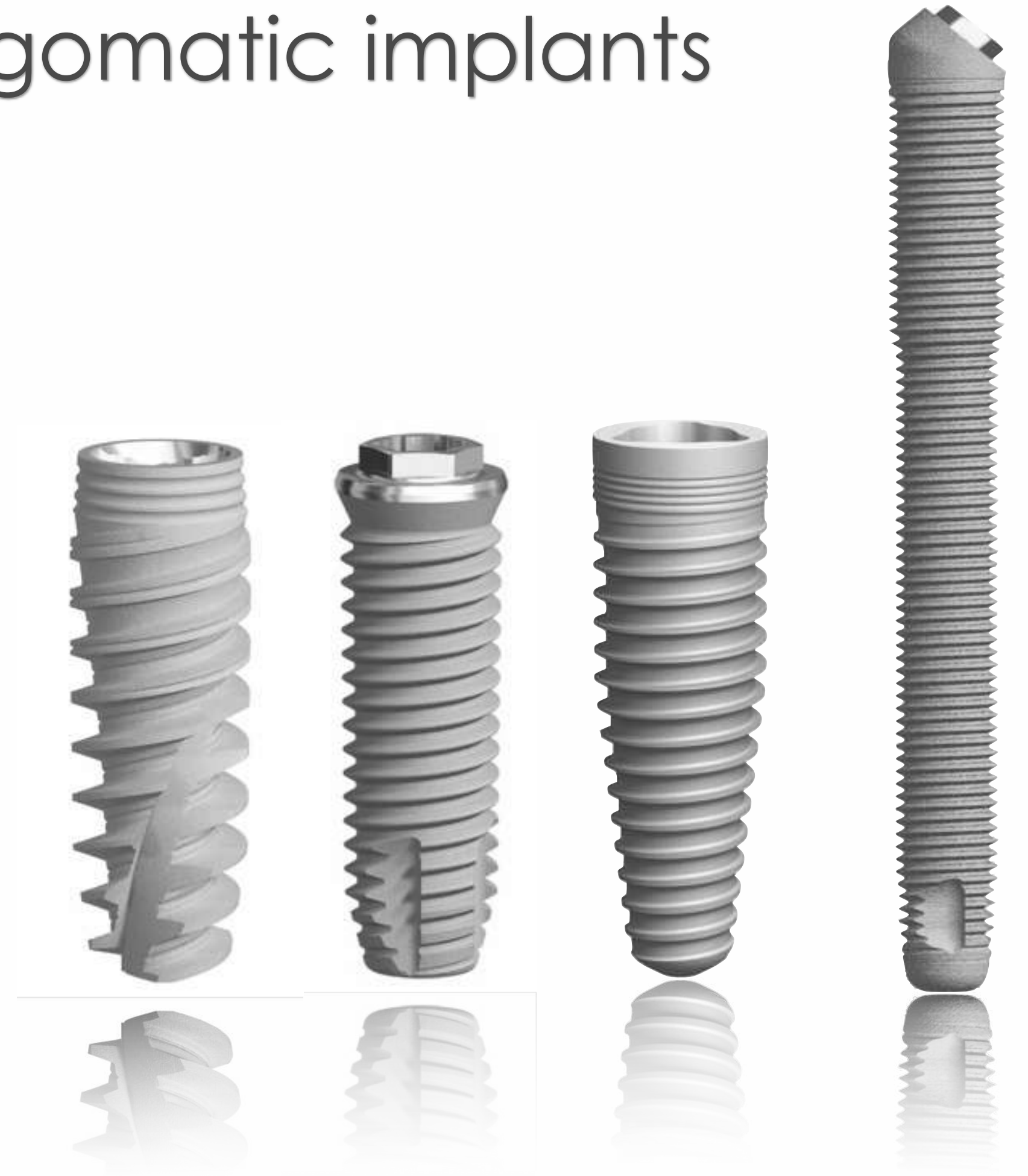
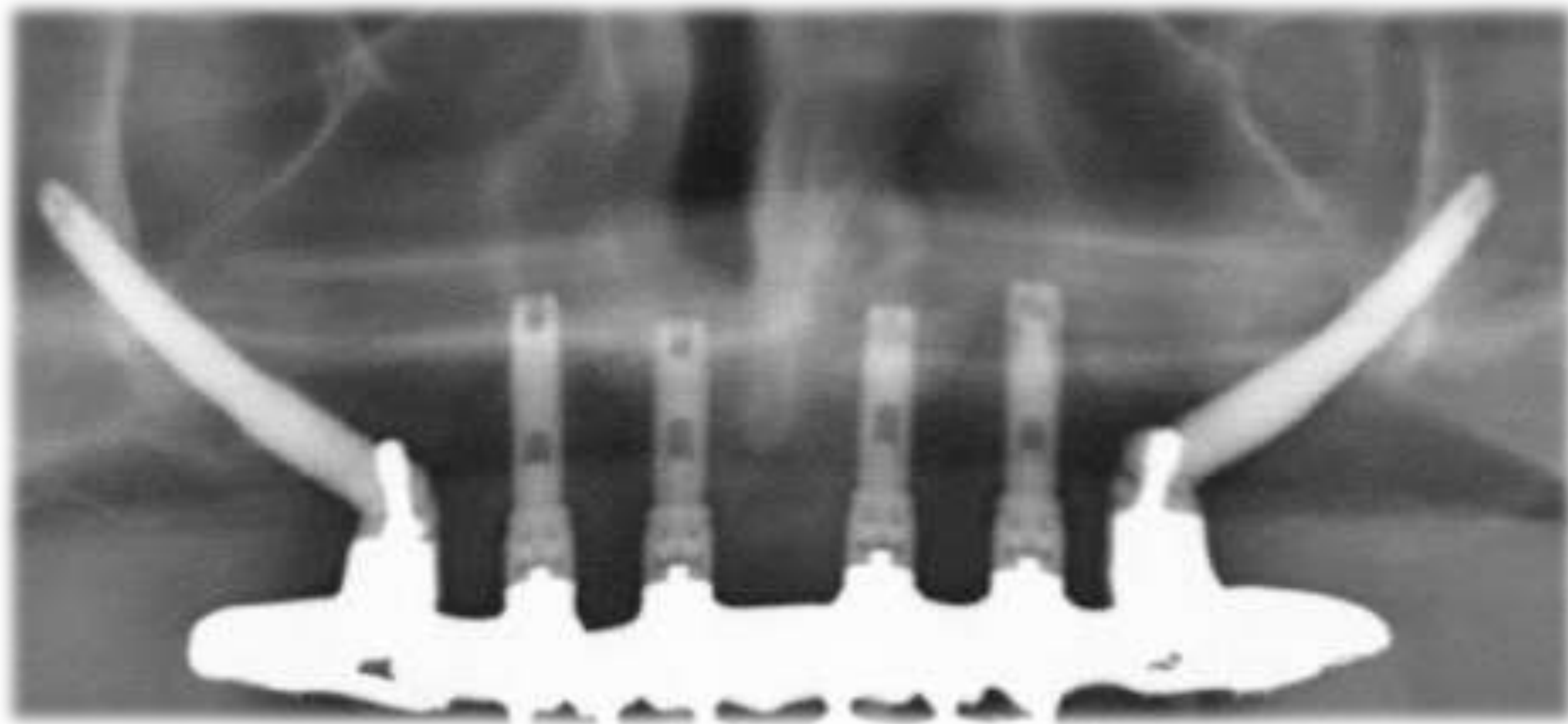
Treatment Planning Guidelines

Zones 1,2 - Traditional Axial and Tilted implants



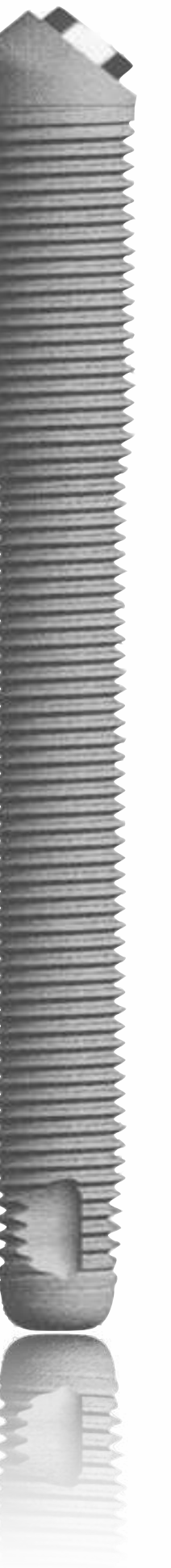
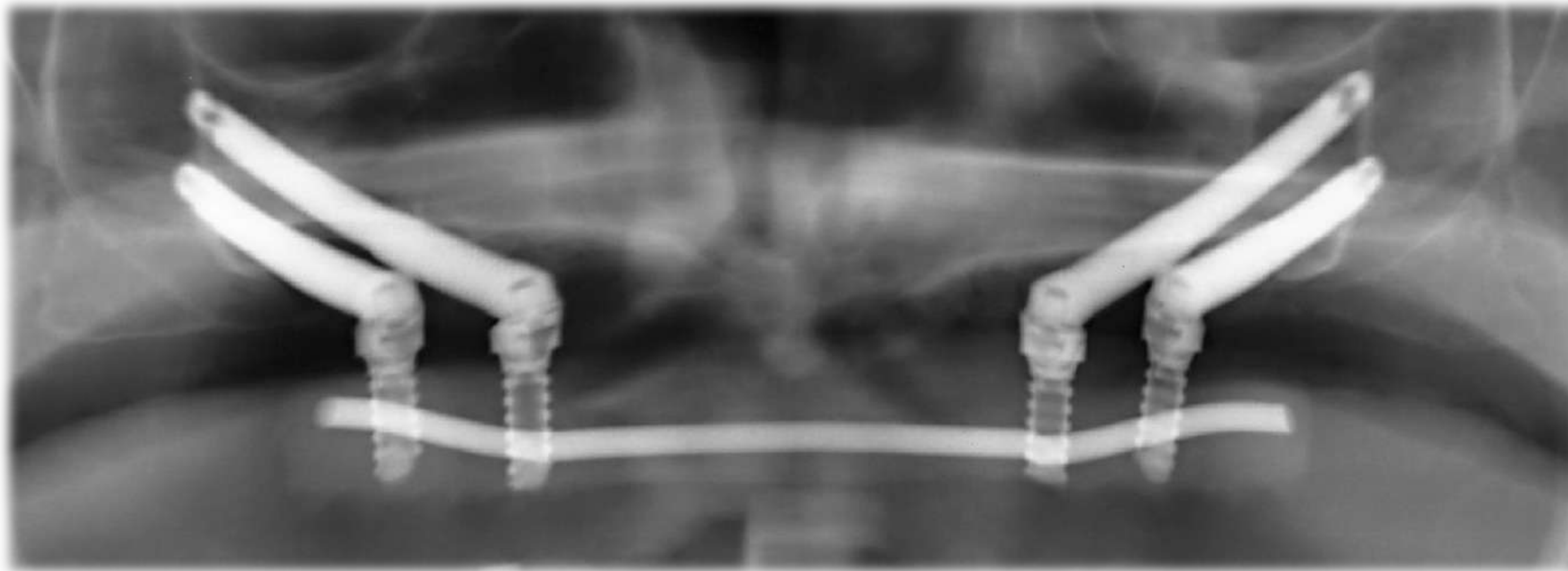
Treatment Planning Guidelines

Zone 1 only - Traditional Axial and Zygomatic implants

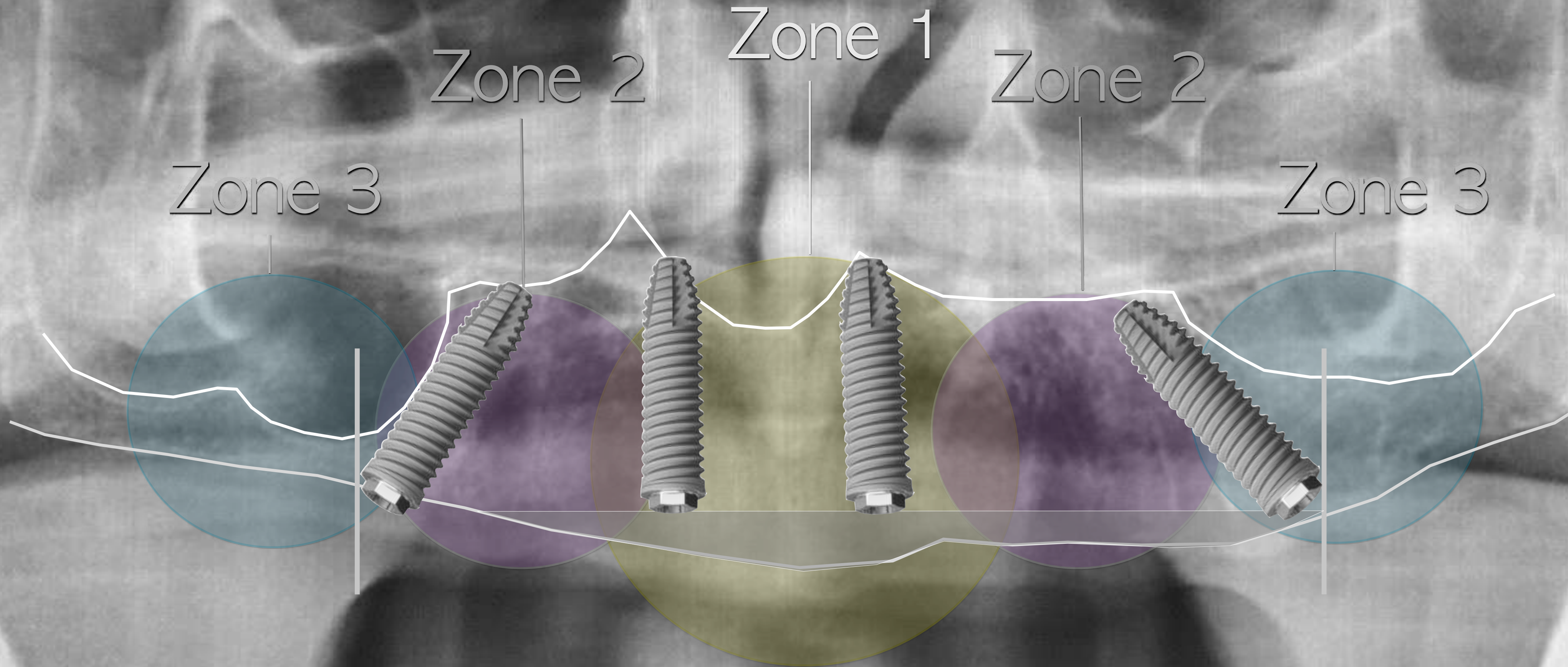


Treatment Planning Guidelines

Insufficient bone in all zones - Quad Zygoma

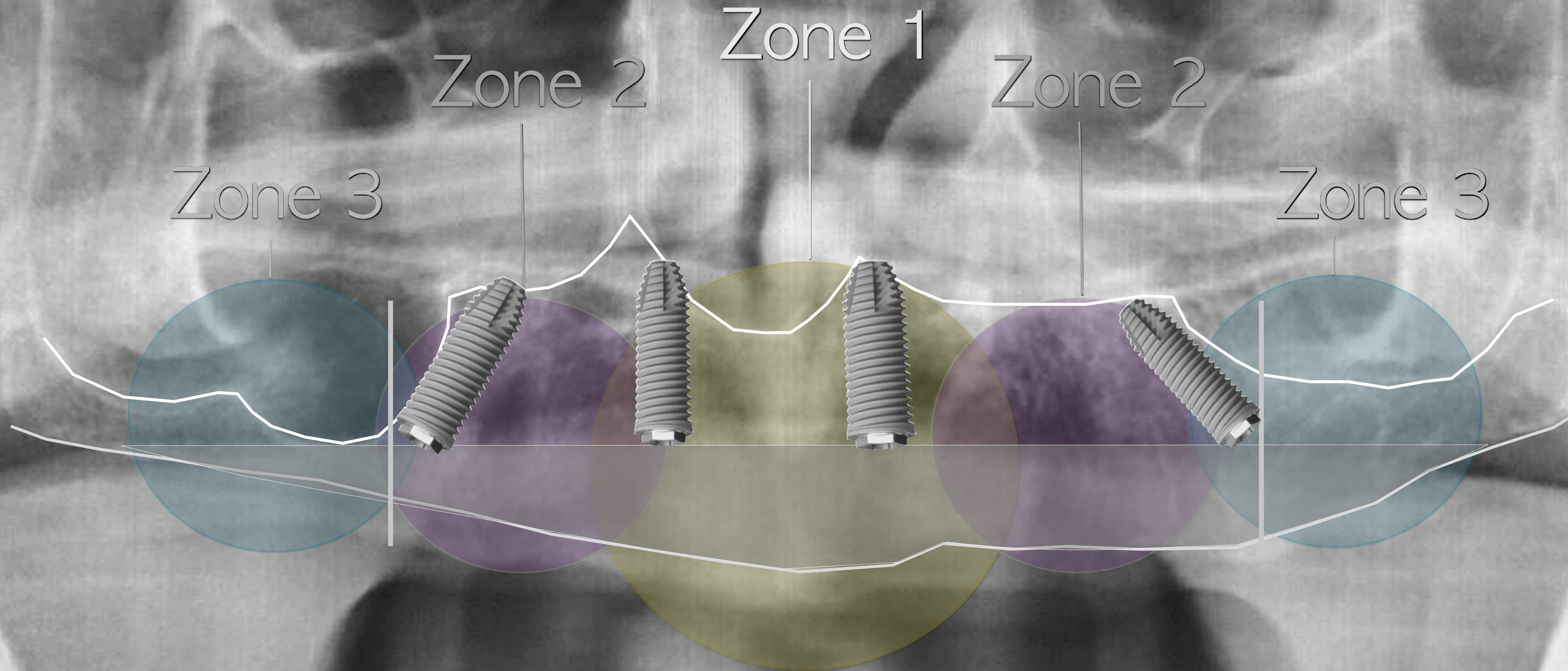


Ridge reduction affects implant length and AP spread



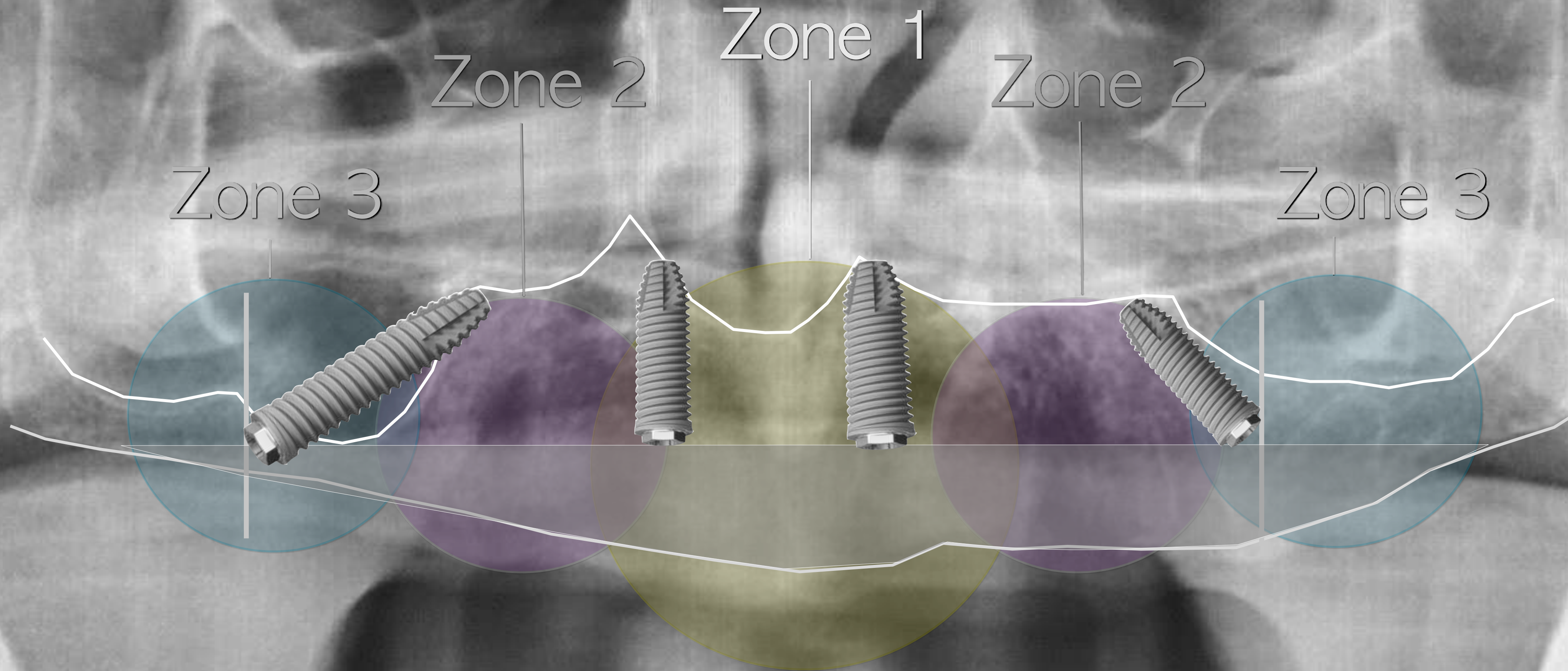
Bedrossian E, Sullivan RM, Fortin Y, Malo P, Indresano T. Fixed-prosthetic implant restoration of the edentulous maxilla: a systematic pretreatment evaluation method. J Oral Maxillofac Surg. 2008;66(1):112-22.

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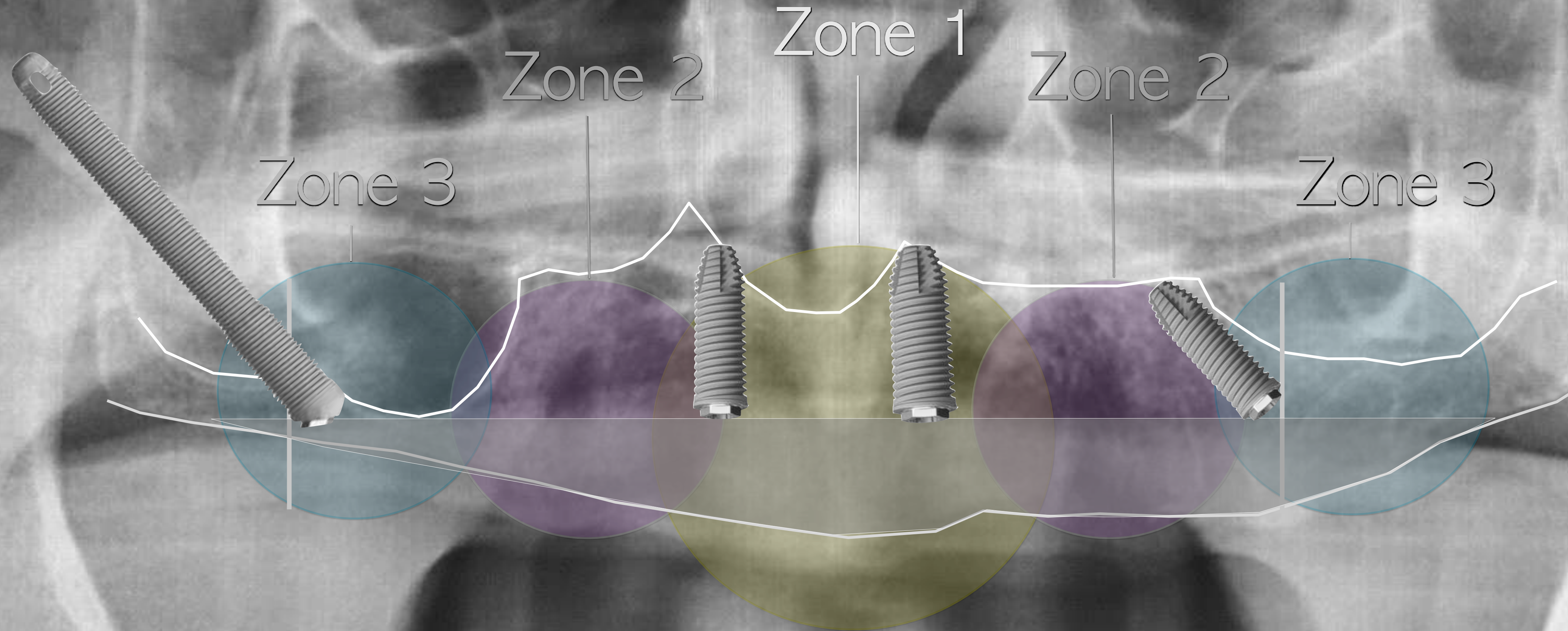
Bedrossian E, Sullivan RM, Fortin Y, Malo P, Indresano T. Fixed-prosthetic implant restoration of the edentulous maxilla: a systematic pretreatment evaluation method. J Oral Maxillofac Surg. 2008;66(1):112-22.

Ridge reduction affects implant length and AP spread



Maló P, Nobre Md, Lopes A. Immediate loading of 'All-on-4' maxillary prostheses using trans-sinus tilted implants without sinus bone grafting: a retrospective study reporting the 3-year outcome. Eur J Oral Implantol. 2013;6(3):273-83.

Ridge reduction affects implant length and AP spread



Goiato MC, Pellizzer EP, Moreno A, Gennari-Filho H, dos Santos DM, Santiago JF Jr, dos Santos EG. Implants in the zygomatic bone for maxillary prosthetic rehabilitation: a systematic review. *Int J Oral Maxillofac Surg*. 2014;43(6):748-57.

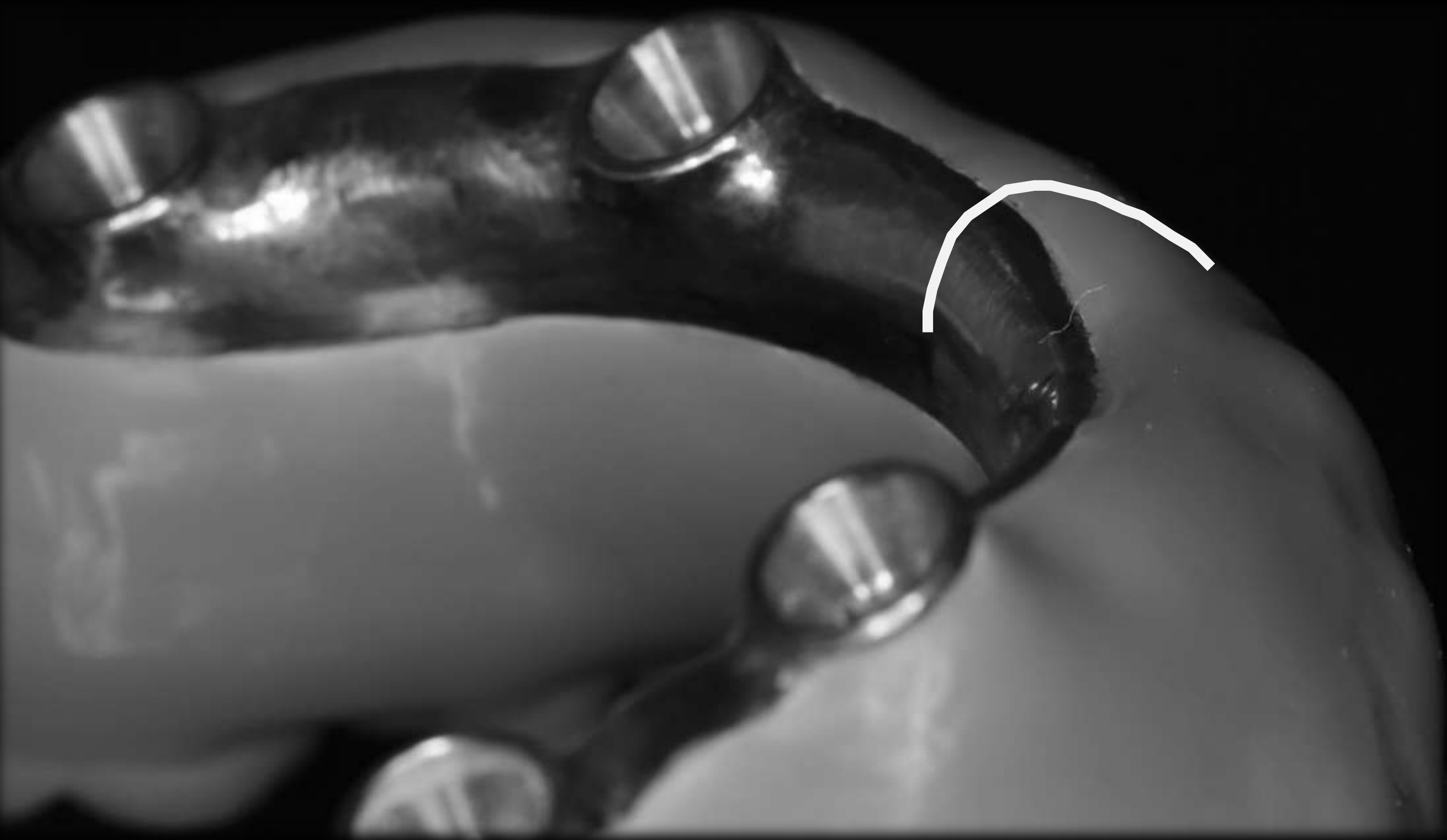
Home Care *Patient Aids*



CLEANSIBILITY

CONVEX TISSUE FITTING SURFACE

Convex tissue fitting surface





DEFINITIVE BRIDGE OPTIONS

Both Jaws

- Mandible - acrylic resin
- Maxilla - more wear resistant
 - ceramic if possible



MAXILLARY BRIDGE OPTIONS



Procera Titanium hybrid with acrylic teeth

Maintenance medium but relatively easy to fix

Retread 5-7 years for wear

Staining around margins

Acrylic resin fractures

Tooth fractures



Need
occlusal
splint

SEVERE BRUXISM



Torsello F, di Torresanto VM, Ercoli C, Cordaro L. Evaluation of the marginal precision of one-piece complete arch titanium frameworks fabricated using five different methods for implant-supported restorations. Clin Oral Implants Res. 2008;19(8):772-9.

Hjalmarsson L, Örtorp A, Smedberg JI, Jemt T. Precision of fit to implants: a comparison of Cresco™ and Procera® implant bridge frameworks. Clin Implant Dent Relat Res. 2010;12(4):271-80.

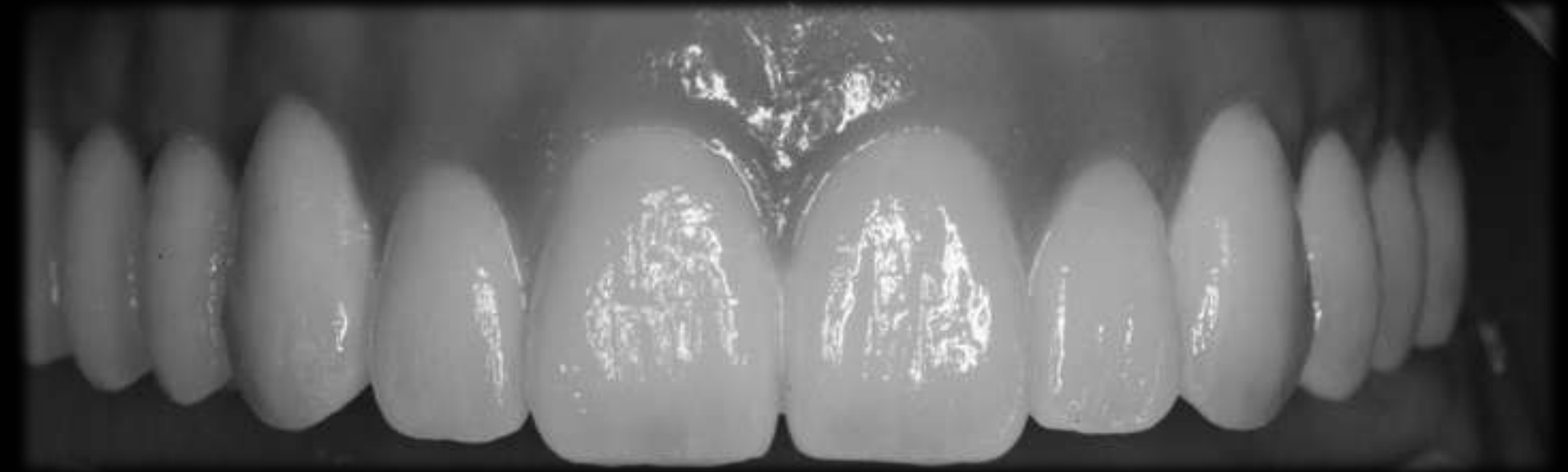
MAXILLARY BRIDGE OPTIONS

PFM - Gold cemented framework

Gold prices are getting crazy

- US\$11K for this one!

Maintenance low but expensive
and difficult to fix



Need
occlusal splint



MAXILLARY BRIDGE OPTIONS

PFM - CrCo framework

CadCam framework -low cost, can have reasonable fit

Maintenance low but expensive and difficult to fix

Gingival replacement - composite (marginal staining), porcelain (aesthetics getting better)



Need occlusal splint



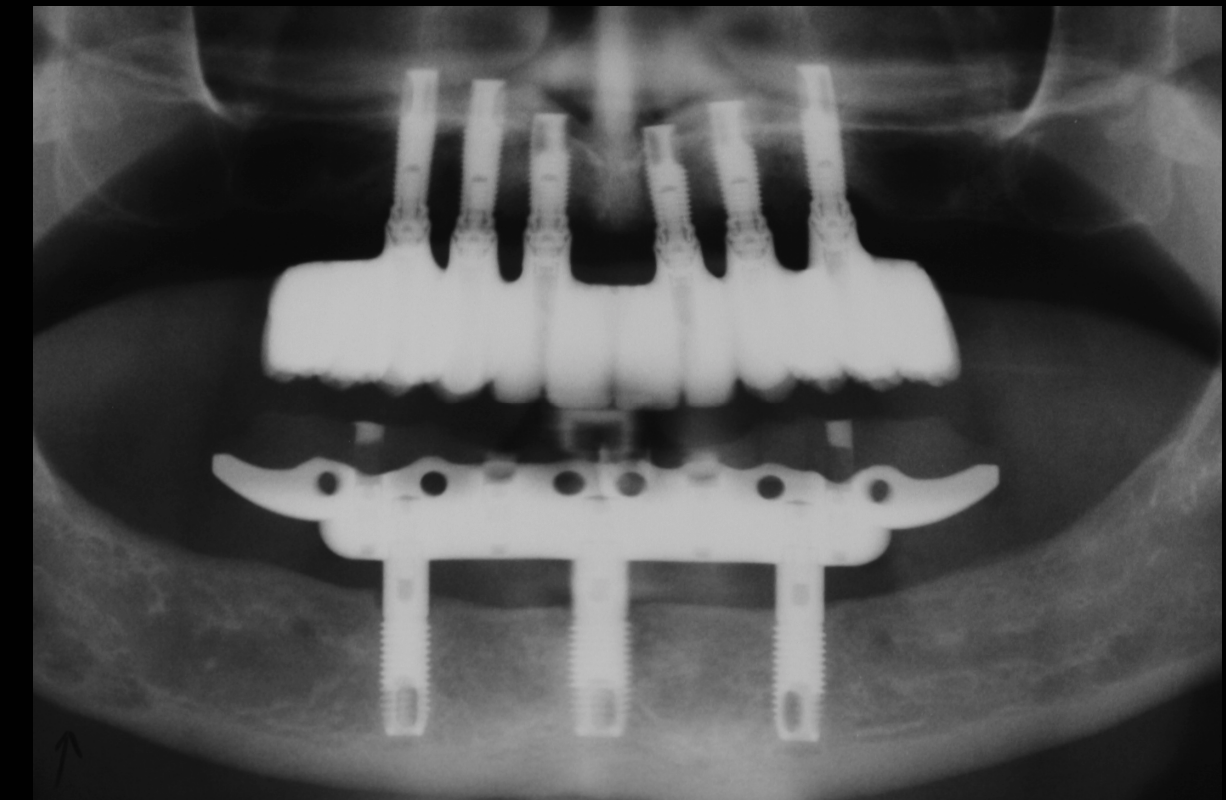
MAXILLARY BRIDGE OPTIONS

PFM - Porcelian fused to titanium

CadCam Procera framework -low
cost, Excellent fit

Maintenance low but expensive and
difficult to fix

Aesthetics of Ti Porcelain ordinary



FLEXURAL STRENGTH

Current Dental Materials

Feldspathic - eg veneering porcelain, veneers	~90Mpa
Pressable ceramics - eg: Empress, Cergo, Optimal	~150Mpa
Indirect composites – eg: Belleglass, Critobal	~200Mpa
Pressable Lithium disilicate – eg: Empr.2, e-Max	~300Mpa
Glass infiltrated ceramics – eg: In-Ceram Alum.	~400Mpa
Alumina – Procera	~650Mpa
(Y-TPZ) Zirconia – eg: Procera, Lava, Allzirkon	~1200Mpa

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MAXILLARY BRIDGE OPTIONS

eMax ceramic crowns layered anteriorly,
monolithic posteriorly (300MPa vs 90MPa veneering
porcelain)

No Gold component in Procera framework and no
difference in cost for size of framework

Maintenance low and generally just replacement
of one crown

Gingival replacement - composite (marginal
staining) - can be retreaded relatively easily

Need
occlusal splint





FLEXURAL STRENGTH

Current Dental Materials

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MAXILLARY BRIDGE OPTIONS

Full Zirconia

Massive downside if framework fracture

Industrial fabrication essential

Need highly experienced technician

Attention to detail

More long term clinical research required



Need occlusal
splint



MAXILLARY BRIDGE OPTIONS



Ti CAD CAM framework/ Stained Monolithic Zirconia segments



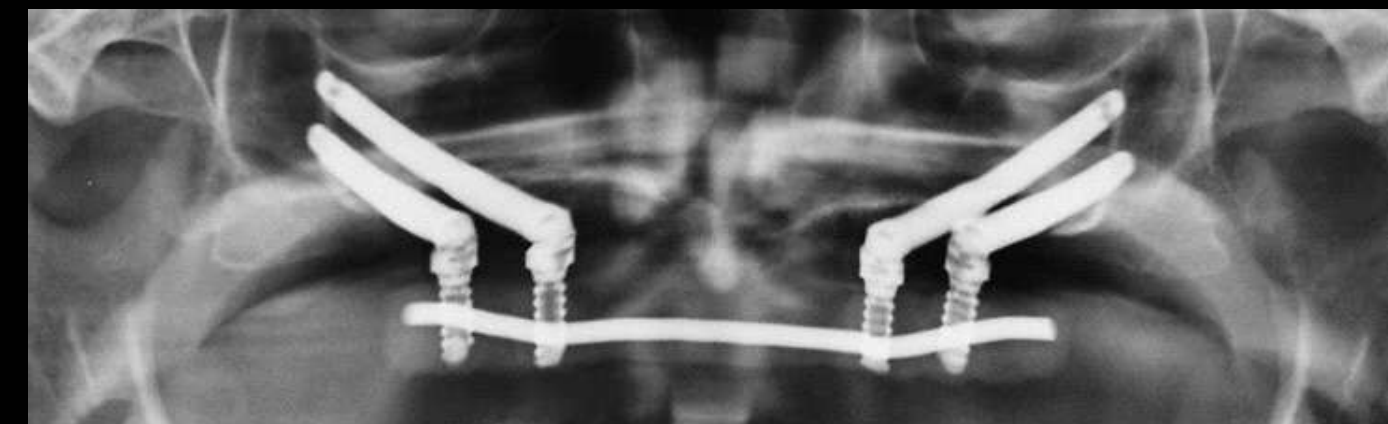
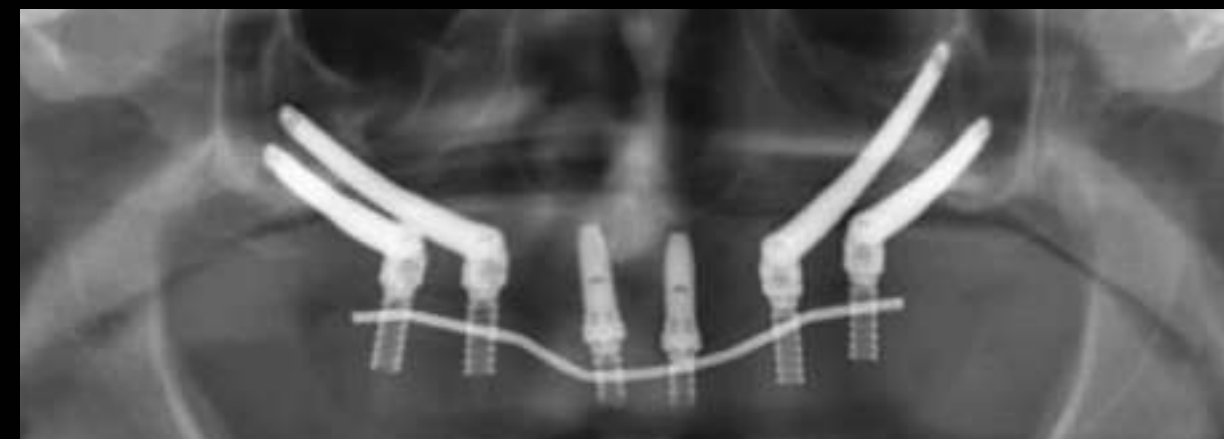
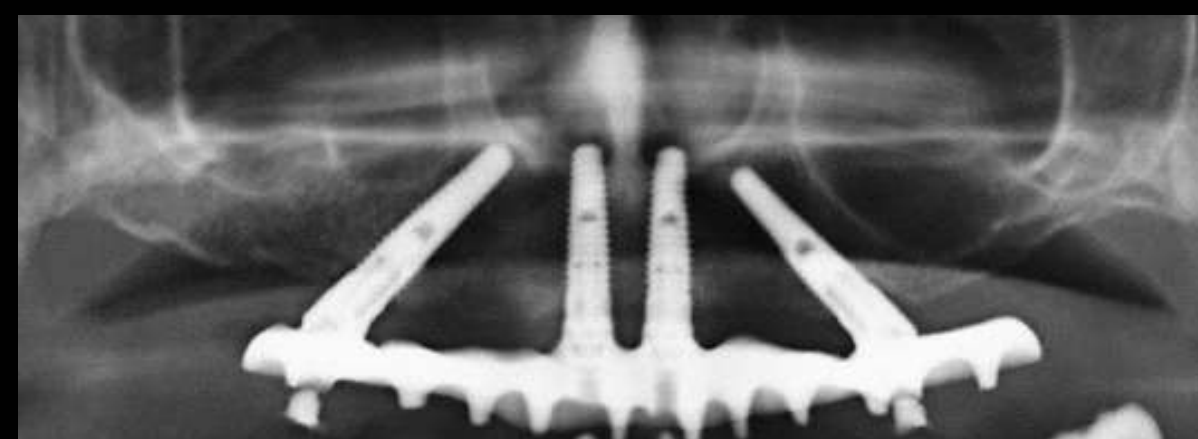
MAINTENANCE PROTOCOL



- Follow-up weekly for first 4 weeks then 6 weekly until 6 months
- Then 3-6 mthly according to need
- OPG Radiographs at bridge placement, 6 mths, then yearly for 5 years
- Then every 2-3 years depending on history

OUR PREFERENCES

No Pre-implant Grafting
Utilize available native bone



OUR PREFERENCES

Immediate Loading

Rigid prosthesis

Cross arch splinting



OUR PREFERENCES

Prosthetic replacement
of soft tissue and facial
support



PATIENT BENEFITS

IMMEDIATE BENEFITS

Optimal Comfort

- Less invasive surgery
- Less pain and swelling
- Reduced chairtime

Cost Saving

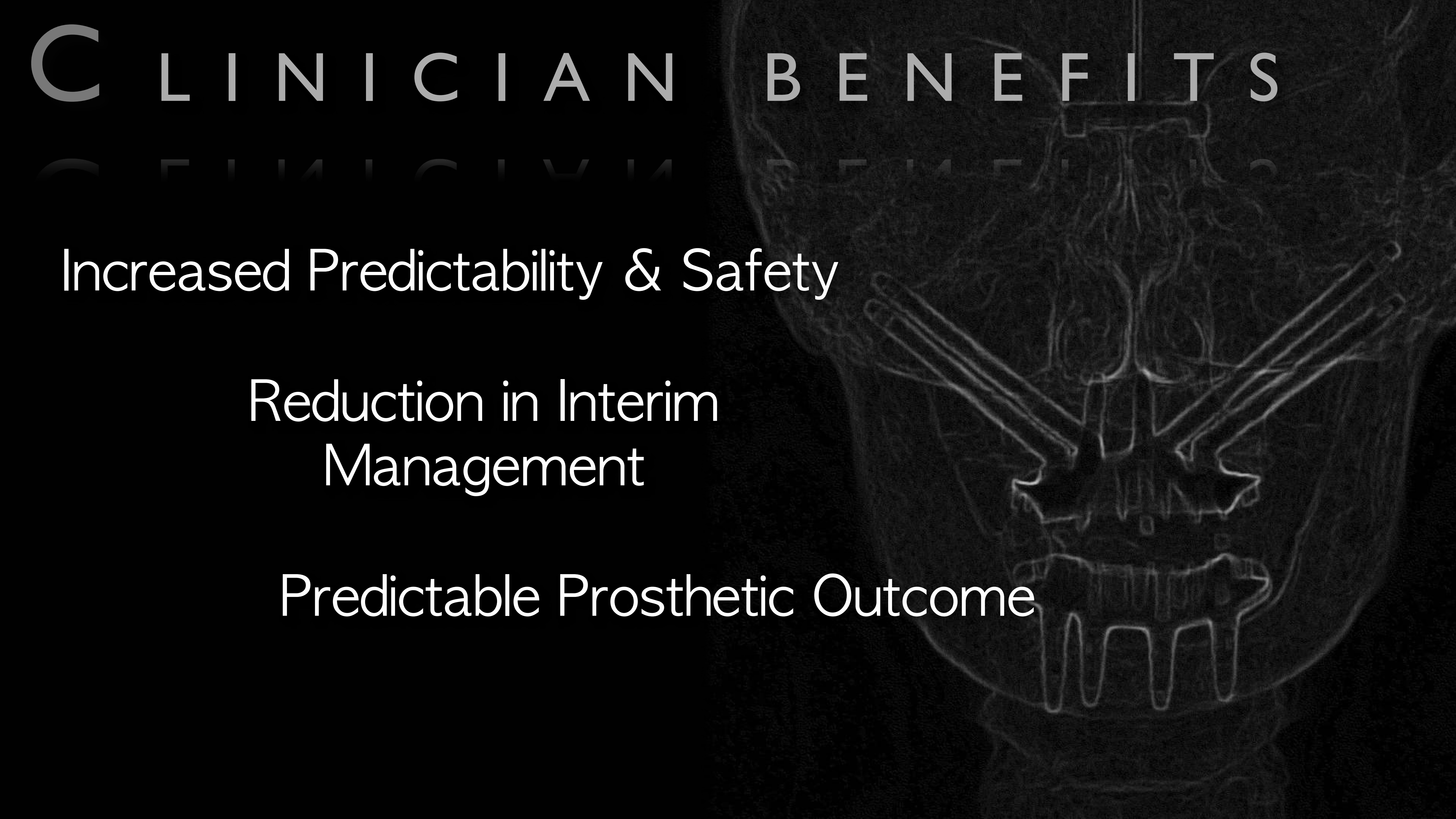
- Much earlier return to work and social life

Fast Treatment

- Immediate function



C L I N I C I A N B E N E F I T S



Increased Predictability & Safety

Reduction in Interim
Management

Predictable Prosthetic Outcome



Thank you!



THE UNIVERSITY OF
WESTERN AUSTRALIA

glenliddelow@gmail.com
www.branemarkcentre.com.au

BRÅNEMARK CENTRE
PERTH, AUSTRALIA