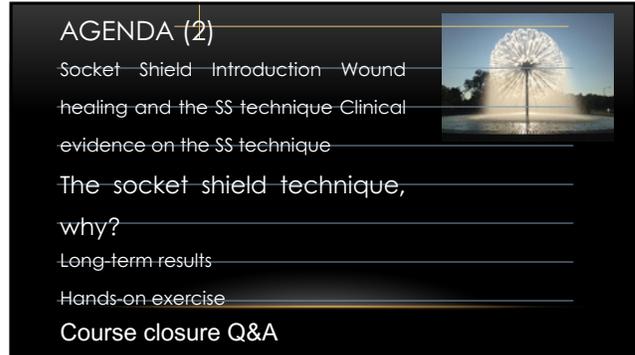
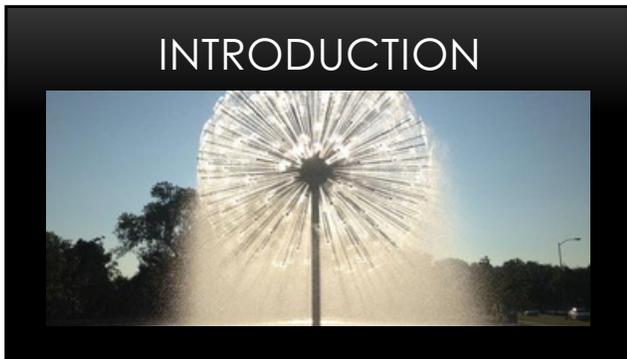




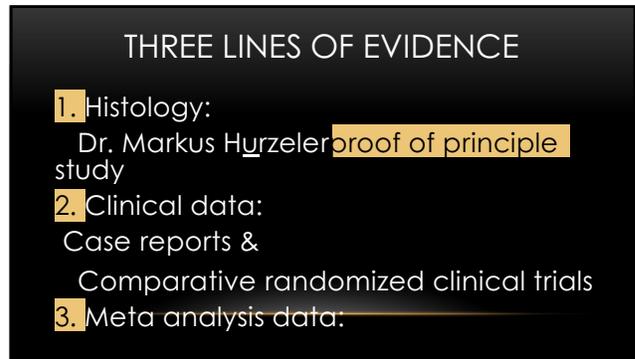
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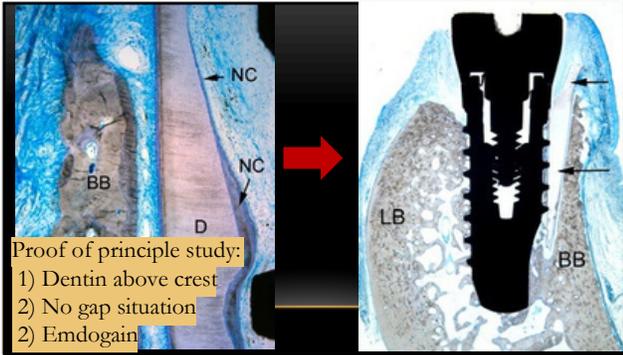
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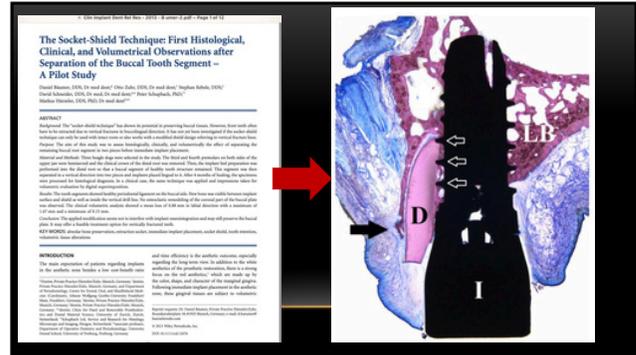


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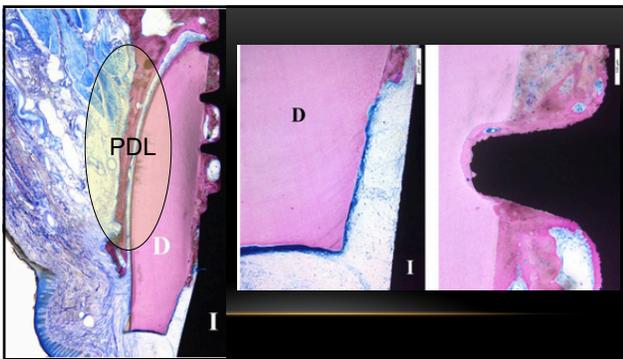


Proof of principle study:
 1) Dentin above crest
 2) No gap situation
 2) Emdogain

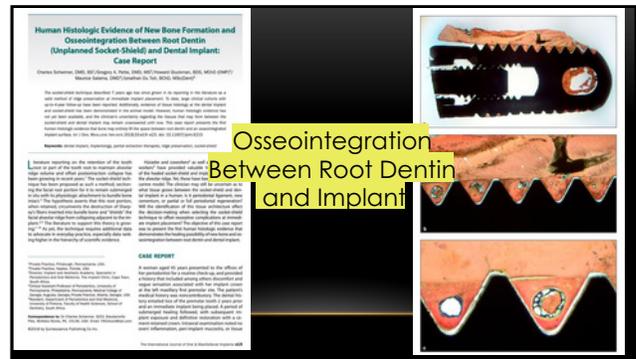
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9



10

THREE LINES OF EVIDENCE

1. Histology:
Dr. Markus Hürzeler proof of principle study
2. Clinical data:
Case reports &
Comparative randomized clinical trials
3. Meta analysis data:

11

5 YEARS VOLUME CHANGE

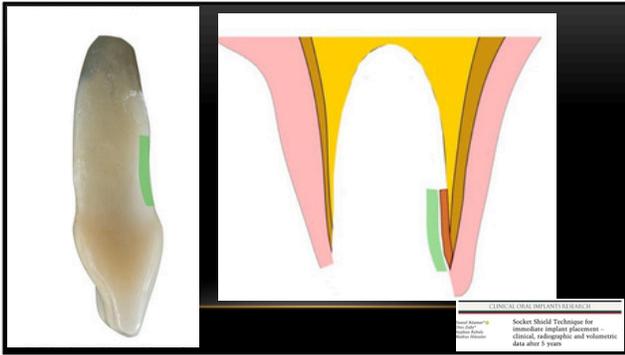
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RECESSION

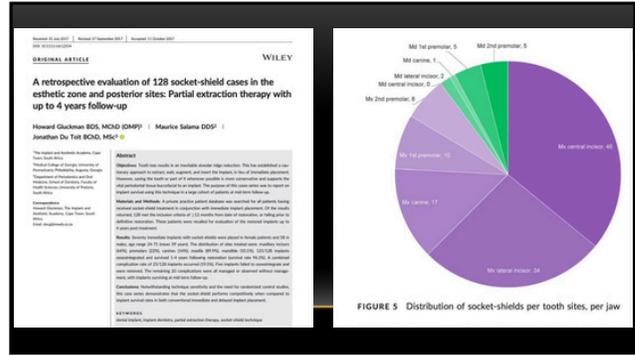
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Volume #	Site	Baseline	Mean Change (mm)	Min	Max	Volume Change (mm ³)
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3	3	0.00	-0.02	-0.02	0.00	-0.12
4	4	0.00	-0.02	-0.02	0.00	-0.12
5	5	0.00	-0.02	-0.02	0.00	-0.12
6	6	0.00	-0.02	-0.02	0.00	-0.12
7	7	0.00	-0.02	-0.02	0.00	-0.12
8	8	0.00	-0.02	-0.02	0.00	-0.12
9	9	0.00	-0.02	-0.02	0.00	-0.12
10	10	0.00	-0.02	-0.02	0.00	-0.12
11	11	0.00	-0.02	-0.02	0.00	-0.12
12	12	0.00	-0.02	-0.02	0.00	-0.12
13	13	0.00	-0.02	-0.02	0.00	-0.12
14	14	0.00	-0.02	-0.02	0.00	-0.12
15	15	0.00	-0.02	-0.02	0.00	-0.12
16	16	0.00	-0.02	-0.02	0.00	-0.12
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24	24	0.00	-0.02	-0.02	0.00	-0.12
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31	31	0.00	-0.02	-0.02	0.00	-0.12
32	32	0.00	-0.02	-0.02	0.00	-0.12
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44	44	0.00	-0.02	-0.02	0.00	-0.12
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47	47	0.00	-0.02	-0.02	0.00	-0.12
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49	49	0.00	-0.02	-0.02	0.00	-0.12
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85	85	0.00	-0.02	-0.02	0.00	-0.12
86	86	0.00	-0.02	-0.02	0.00	-0.12
87	87	0.00	-0.02	-0.02	0.00	-0.12
88	88	0.00	-0.02	-0.02	0.00	-0.12
89	89	0.00	-0.02	-0.02	0.00	-0.12
90	90	0.00	-0.02	-0.02	0.00	-0.12
91	91	0.00	-0.02	-0.02	0.00	-0.12
92	92	0.00	-0.02	-0.02	0.00	-0.12
93	93	0.00	-0.02	-0.02	0.00	-0.12
94	94	0.00	-0.02	-0.02	0.00	-0.12
95	95	0.00	-0.02	-0.02	0.00	-0.12
96	96	0.00	-0.02	-0.02	0.00	-0.12
97	97	0.00	-0.02	-0.02	0.00	-0.12
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12



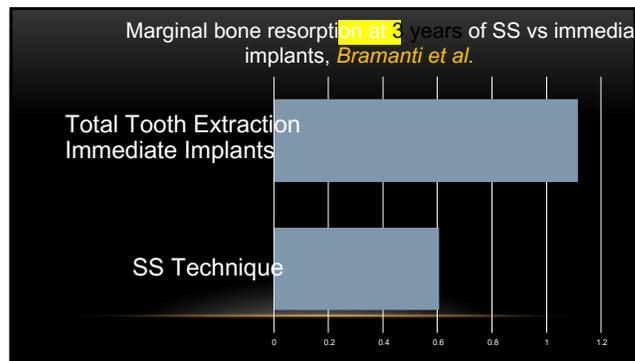
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Case #	Sex	Age	Site	Implant	Outcome	Notes
1	F	35	Maxillary lateral incisor	ITI Roxolid	Success	Socket shield technique
2	F	38	Maxillary central incisor	ITI Roxolid	Success	Socket shield technique
3	F	42	Maxillary 1st premolar	ITI Roxolid	Success	Socket shield technique
4	F	45	Maxillary 2nd premolar	ITI Roxolid	Success	Socket shield technique
5	F	48	Maxillary canine	ITI Roxolid	Success	Socket shield technique
6	F	52	Maxillary lateral incisor	ITI Roxolid	Success	Socket shield technique
7	F	55	Maxillary central incisor	ITI Roxolid	Success	Socket shield technique
8	F	58	Maxillary 1st premolar	ITI Roxolid	Success	Socket shield technique
9	F	62	Maxillary 2nd premolar	ITI Roxolid	Success	Socket shield technique
10	F	65	Maxillary canine	ITI Roxolid	Success	Socket shield technique
11	F	68	Maxillary lateral incisor	ITI Roxolid	Success	Socket shield technique
12	F	72	Maxillary central incisor	ITI Roxolid	Success	Socket shield technique
13	F	75	Maxillary 1st premolar	ITI Roxolid	Success	Socket shield technique
14	F	78	Maxillary 2nd premolar	ITI Roxolid	Success	Socket shield technique
15	F	82	Maxillary canine	ITI Roxolid	Success	Socket shield technique
16	F	85	Maxillary lateral incisor	ITI Roxolid	Success	Socket shield technique
17	F	88	Maxillary central incisor	ITI Roxolid	Success	Socket shield technique
18	F	92	Maxillary 1st premolar	ITI Roxolid	Success	Socket shield technique
19	F	95	Maxillary 2nd premolar	ITI Roxolid	Success	Socket shield technique
20	F	98	Maxillary canine	ITI Roxolid	Success	Socket shield technique
21	F	102	Maxillary lateral incisor	ITI Roxolid	Success	Socket shield technique
22	F	105	Maxillary central incisor	ITI Roxolid	Success	Socket shield technique
23	F	108	Maxillary 1st premolar	ITI Roxolid	Success	Socket shield technique
24	F	112	Maxillary 2nd premolar	ITI Roxolid	Success	Socket shield technique
25	F	115	Maxillary canine	ITI Roxolid	Success	Socket shield technique
26	F	118	Maxillary lateral incisor	ITI Roxolid	Success	Socket shield technique
27	F	122	Maxillary central incisor	ITI Roxolid	Success	Socket shield technique
28	F	125	Maxillary 1st premolar	ITI Roxolid	Success	Socket shield technique
29	F	128	Maxillary 2nd premolar	ITI Roxolid	Success	Socket shield technique
30	F	132	Maxillary canine	ITI Roxolid	Success	Socket shield technique
31	F	135	Maxillary lateral incisor	ITI Roxolid	Success	Socket shield technique
32	F	138	Maxillary central incisor	ITI Roxolid	Success	Socket shield technique
33	F	142	Maxillary 1st premolar	ITI Roxolid	Success	Socket shield technique
34	F	145	Maxillary 2nd premolar	ITI Roxolid	Success	Socket shield technique
35	F	148	Maxillary canine	ITI Roxolid	Success	Socket shield technique
36	F	152	Maxillary lateral incisor	ITI Roxolid	Success	Socket shield technique
37	F	155	Maxillary central incisor	ITI Roxolid	Success	Socket shield technique
38	F	158	Maxillary 1st premolar	ITI Roxolid	Success	Socket shield technique
39	F	162	Maxillary 2nd premolar	ITI Roxolid	Success	Socket shield technique
40	F	165	Maxillary canine	ITI Roxolid	Success	Socket shield technique
41	F	168	Maxillary lateral incisor	ITI Roxolid	Success	Socket shield technique
42	F	172	Maxillary central incisor	ITI Roxolid	Success	Socket shield technique
43	F	175	Maxillary 1st premolar	ITI Roxolid	Success	Socket shield technique
44	F	178	Maxillary 2nd premolar	ITI Roxolid	Success	Socket shield technique
45	F	182	Maxillary canine	ITI Roxolid	Success	Socket shield technique
46	F	185	Maxillary lateral incisor	ITI Roxolid	Success	Socket shield technique
47	F	188	Maxillary central incisor	ITI Roxolid	Success	Socket shield technique
48	F	192	Maxillary 1st premolar	ITI Roxolid	Success	Socket shield technique
49	F	195	Maxillary 2nd premolar	ITI Roxolid	Success	Socket shield technique
50	F	198	Maxillary canine	ITI Roxolid	Success	Socket shield technique
51	F	202	Maxillary lateral incisor	ITI Roxolid	Success	Socket shield technique
52	F	205	Maxillary central incisor	ITI Roxolid	Success	Socket shield technique
53	F	208	Maxillary 1st premolar	ITI Roxolid	Success	Socket shield technique
54	F	212	Maxillary 2nd premolar	ITI Roxolid	Success	Socket shield technique
55	F	215	Maxillary canine	ITI Roxolid	Success	Socket shield technique
56	F	218	Maxillary lateral incisor	ITI Roxolid	Success	Socket shield technique
57	F	222	Maxillary central incisor	ITI Roxolid	Success	Socket shield technique
58	F	225	Maxillary 1st premolar	ITI Roxolid	Success	Socket shield technique
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65	F	248	Maxillary canine	ITI Roxolid	Success	Socket shield technique
66	F	252	Maxillary lateral incisor	ITI Roxolid	Success	Socket shield technique
67	F	255	Maxillary central incisor	ITI Roxolid	Success	Socket shield technique
68	F	258	Maxillary 1st premolar	ITI Roxolid	Success	Socket shield technique
69	F	262	Maxillary 2nd premolar	ITI Roxolid	Success	Socket shield technique
70	F	265	Maxillary canine	ITI Roxolid	Success	Socket shield technique
71	F	268	Maxillary lateral incisor	ITI Roxolid	Success	Socket shield technique
72	F	272	Maxillary central incisor	ITI Roxolid	Success	Socket shield technique
73	F	275	Maxillary 1st premolar	ITI Roxolid	Success	Socket shield technique
74	F	278	Maxillary 2nd premolar	ITI Roxolid	Success	Socket shield technique
75	F	282	Maxillary canine	ITI Roxolid	Success	Socket shield technique
76	F	285	Maxillary lateral incisor	ITI Roxolid	Success	Socket shield technique
77	F	288	Maxillary central incisor	ITI Roxolid	Success	Socket shield technique
78	F	292	Maxillary 1st premolar	ITI Roxolid	Success	Socket shield technique
79	F	295	Maxillary 2nd premolar	ITI Roxolid	Success	Socket shield technique
80	F	298	Maxillary canine	ITI Roxolid	Success	Socket shield technique
81	F	302	Maxillary lateral incisor	ITI Roxolid	Success	Socket shield technique
82	F	305	Maxillary central incisor	ITI Roxolid	Success	Socket shield technique
83	F	308	Maxillary 1st premolar	ITI Roxolid	Success	Socket shield technique
84	F	312	Maxillary 2nd premolar	ITI Roxolid	Success	Socket shield technique
85	F	315	Maxillary canine	ITI Roxolid	Success	Socket shield technique
86	F	318	Maxillary lateral incisor	ITI Roxolid	Success	Socket shield technique
87	F	322	Maxillary central incisor	ITI Roxolid	Success	Socket shield technique
88	F	325	Maxillary 1st premolar	ITI Roxolid	Success	Socket shield technique
89	F	328	Maxillary 2nd premolar	ITI Roxolid	Success	Socket shield technique
90	F	332	Maxillary canine	ITI Roxolid	Success	Socket shield technique
91	F	335	Maxillary lateral incisor	ITI Roxolid	Success	Socket shield technique
92	F	338	Maxillary central incisor	ITI Roxolid	Success	Socket shield technique
93	F	342	Maxillary 1st premolar	ITI Roxolid	Success	Socket shield technique
94	F	345	Maxillary 2nd premolar	ITI Roxolid	Success	Socket shield technique
95	F	348	Maxillary canine	ITI Roxolid	Success	Socket shield technique
96	F	352	Maxillary lateral incisor	ITI Roxolid	Success	Socket shield technique
97	F	355	Maxillary central incisor	ITI Roxolid	Success	Socket shield technique
98	F	358	Maxillary 1st premolar	ITI Roxolid	Success	Socket shield technique
99	F	362	Maxillary 2nd premolar	ITI Roxolid	Success	Socket shield technique
100	F	365	Maxillary canine	ITI Roxolid	Success	Socket shield technique

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Postextraction Dental Implant in the Aesthetic Zone, Socket Shield Technique Versus Conventional Protocol

Ennio Bramanti, DDS, PhD, Antonio Norcia, MD, DDS,† Marco Cicciù, DDS, PhD,* Giada Mancuso, DDS, PhD,‡ Gabriela Corvino, DDS, PhD,§ Giuseppe Tronzo, DDS,† Khrystyna Zhuravivka, DDS,† and Luigi Laino, DDS, PhD,‡*

Table	Group	Mean (SD)	P-value
TABLE 1. Evaluation of PDI Points	Socket shield technique	12.15 ± 0.87	0.00008
	Conventional protocol	10.3 ± 1.59	
TABLE 2. En Time Points	Socket shield	0.605 ± 0.06	0.00014
	Conventional	1.115 ± 0.131	

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- THREE LINES OF EVIDENCE**
1. Histology: Dr. Markus Hürzeler proof of principle study
 2. Clinical data: Case reports & Comparative randomized clinical trials
 3. Meta analysis data:

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Clinical outcomes of retention of the buccal root section combined with immediate implant placement: A systematic review of longitudinal studies

Georgeios A, Kotsakis DMD, MS¹ | Thomas T, Nguyen DMD, MSc² | Konstantinos Skrimpas DDS³ | Michael A, Pinos DDS⁴ | Srijazana Pohl Dr. med., Dr. med. dent., PhD⁵ | Dennis Tarnow DDS⁶ | Miltiades Mitsias DDS, MSc, PhD⁷ | Root Membrane Group

Clin Implant Dent Res. 2022; 1-12.

Included studies	Authors	Finding
Comparing conventional flapless immediate implantation and socket shield technique for esthetic and clinical outcomes in a randomized clinical study ¹	Sun and colleagues	N.S.
The oral membrane technique: A retrospective clinical study with 10 to 10 years of follow-up ²	Sarropoulos and colleagues	N.S.
Retention of the buccal root section in the esthetic zone: socket shield technique versus conventional protocol ³	Stamatakis and colleagues	N.S.
Retention of the buccal root section in the esthetic zone: socket shield technique versus conventional protocol ⁴	Chalkias and colleagues	N.S.
Socket shield technique for immediate implant placement: clinical, radiographic, and esthetic data after 3 years ⁵	Blumenfeld and colleagues	N.S.
Immediate implant placement in the esthetic zone utilizing the "root membrane" technique: clinical results up to 3 years post-healing ⁶	Sarropoulos and colleagues	N.S.
The modified socket shield technique ⁷	Sun and colleagues	N.S.
Comparison of immediate implant placement following extraction with and without socket shield technique in esthetic region ⁸	Tsoulas and colleagues	N.S.
Longitudinal soft tissue changes during immediate flapless immediate mandibular implant placement with the root membrane technique ⁹	Mitsias and Sarropoulos	Mitsias and Sarropoulos are developers of the Root Membrane TM that is commercially available in the United States.
Socket shield: An esthetic success? ¹⁰	Darwish and colleagues	N.S.

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PART 2
The socket shield technique
Why?....

20

The partial extraction
SOCKET-SHIELD
technique
WHY?

21



22



23

REASONS

1. Counteract physiologic bone remodeling
2. Minimized soft tissue dimensional changes

24

TECHNIQUE INVOLVES

- Partial Extraction
- Shield development
- Immediate implantation
- Gap treatment
- Provisionalization

1.5 mm

At crest level

Ideal implant depth

25

Socket-Shield =
Technique Sensitive
Requires experience

26

INDICATIONS

- **Type I**, immediate implants
- Failing teeth in esthetic zone
- Patient with high esthetic demands

27

INDICATIONS

- Unrestorable tooth
- Extensive caries
- Lack of ferrule cervical fracture
- Vertical oblique root fracture
- Failed endodontic or restorative treatment
- Tooth resorption

28

CONTRAINDICATIONS

- Vertical fracture of facial root aspect
- Extensive facial bone dehiscence
- Mobile socket shield
- Lack of experience placing immediate implants
- Extensive apical pathology or intrabony defects

29

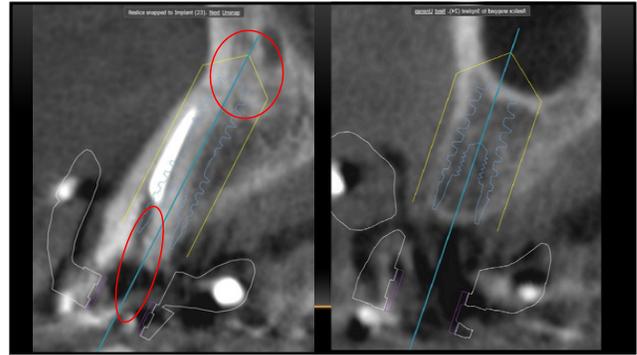
Indications, Immediate Implants

- Implant stability
- Ideal, 4 mm of apical bone for stability
- Mesial-distal bone walls for stability
- Uncompromised osseous anatomy
- Dental infection that can be eliminated

30



31



32

Lee, C.-T.; Chiu, T.-S.; Chuang, S.-K.; Tarnow, D.; Stoupe, J.
 Alterations of the bone dimension following immediate implant placement into extraction socket: Systematic review and meta-analysis.
 J. Clin. Periodontol. 2014, 41, 914-926.

Gingival recession expected after immediate implants = **0.5-1.0 mm**

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JPD
 THE JOURNAL OF PROSTHETIC DENTISTRY

RESEARCH AND EDUCATION

The ability to screw-retain single implant-supported restorations in the anterior maxilla: A CBCT analysis

Erin K. Edmondson, DDS, MS,^a Pedro M. Trejo, DDS, MS,^b Nikolaos Soldatos, DDS, MSD, PhD,^c and Robin L. Weltman, DDS, MS^d

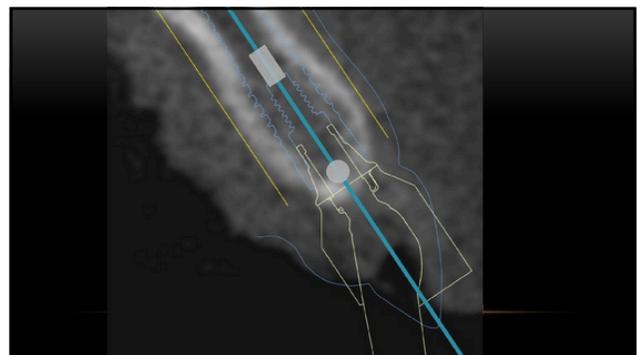
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CONCLUSIONS

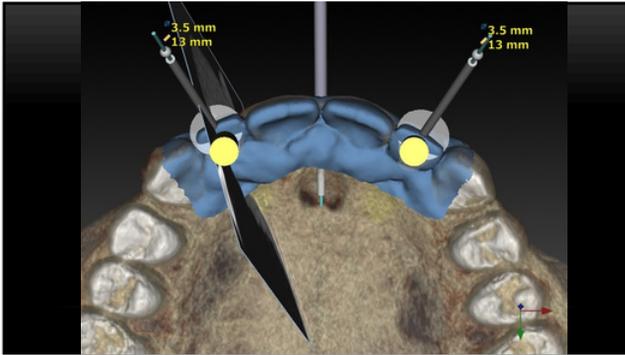
Based on the findings of this observational study, the following conclusions were drawn:

1. Angled screw-channel abutments allowed for screw-retained restorations on digitally planned implants in the anterior maxilla.
2. The required angular correction to a screw-retained restoration was less than or equal to 15 degrees.
3. Screw-retained implant supported restorations were always achievable with the use of angled screw-channel abutments (76%) or with straight abutments (24%).
4. Lateral incisors presented a greater need for angled screw-channel abutments.

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Implant placement software for planning of Socket-Shields

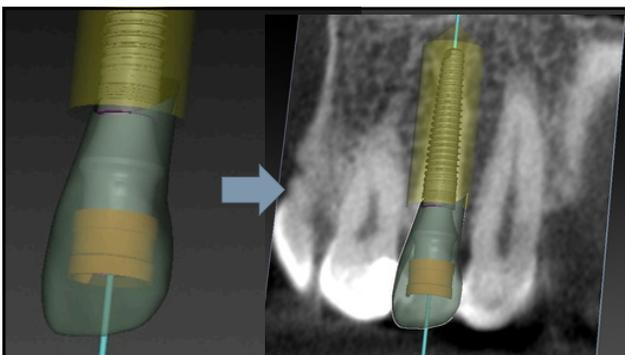
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DOES IMPLANT POSITION (BASED ON SOCKET ANATOMY) DETERMINES THE TYPE OF RESTORATION

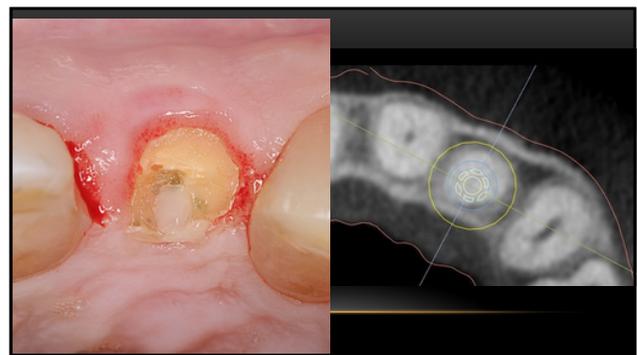
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OR THE TYPE OF RESTORATION DETERMINES THE IMPLANT POSITION?

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SOME NUMBERS TO CONSIDER

- Thickness of the periodontal ligament (PDL) is of varying thickness (0.15–0.38 mm) (Berkovitz, 1990; Nanci and Bosshardt, 2006).

- In the maxilla, the thickness of the buccal wall of bone is less than 1 mm and their angulation with the alveolar process varied between 10 and 30°.

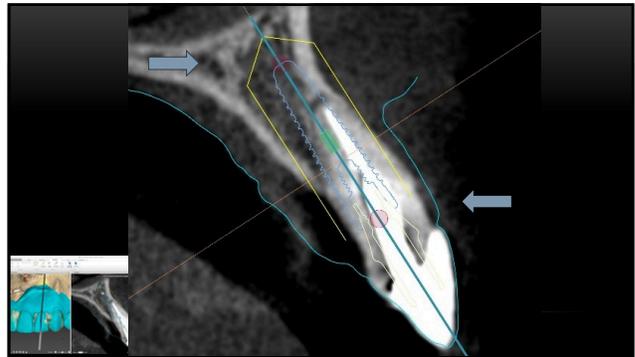
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Apico-coronal

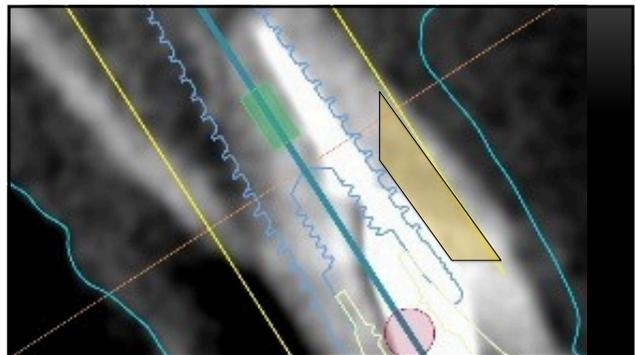
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Facial-lingual

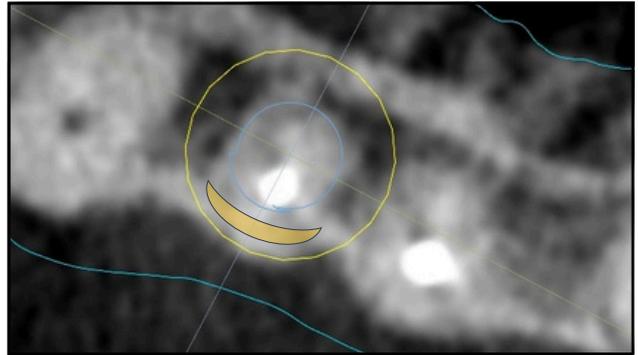
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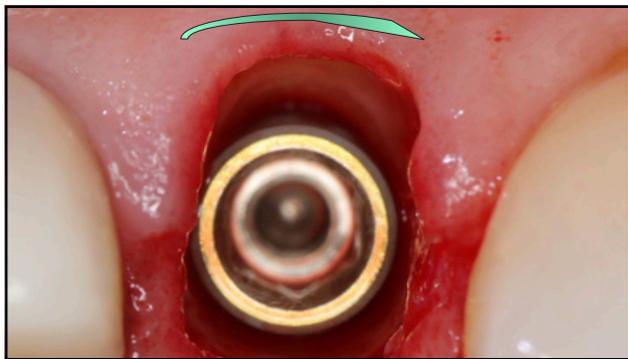
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Mesio-distal

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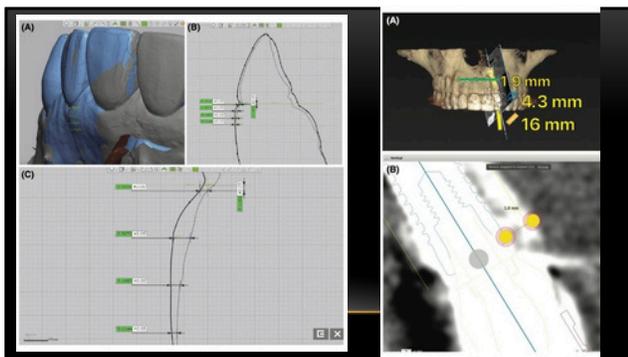
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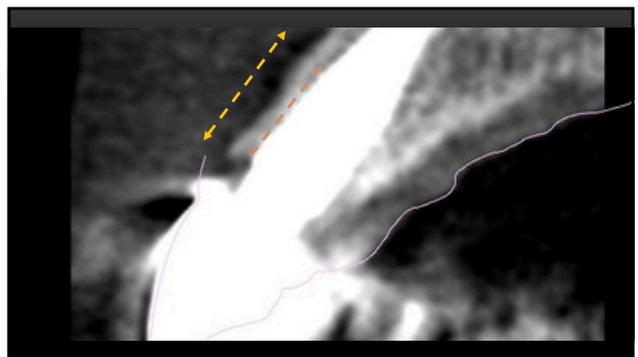
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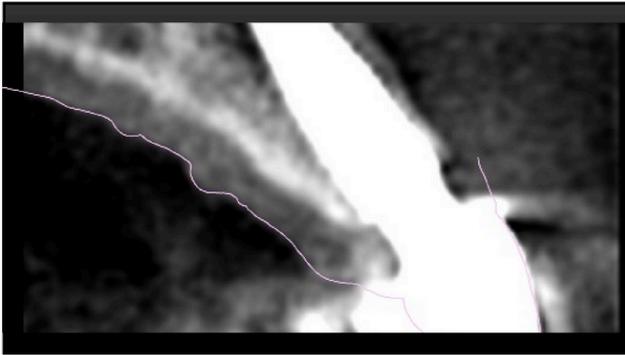
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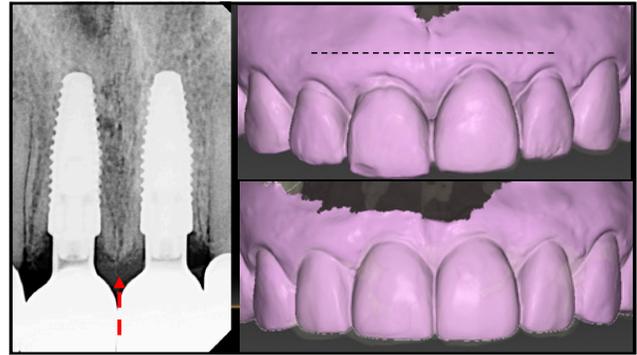
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SOFT AND HARD TISSUE EVALUATION OF GUIDED SOCKET SHIELD IMPLANT CASES

Authors: Padro M. Trigo^{1,2} | Rayna Rivas^{1,2} | Corlette C. Trigo^{1,2} | Seiko Min¹ | Arisa Nishikawa¹

Abstract: The socket shield (SS) technique results in long-term functional crown and abutment integration, preserving the dimensional stability of hard and soft tissues over time. This study aimed to describe the successful implementation of a surgical technique to facilitate SS cases.

Methods: The cases included males and females aged 22-41 years consecutively treated between 2020 and 2023 (average follow-up, 12 years). For each case, pre- and post-operative cone beam computed tomography (CBCT) imaging and Computed Tomography (CT) scans were obtained. Digital imaging and modeling (DAM) and digital models were planned using an implant planning software. Implants were placed according to the planned position and length using a surgical guide. Surgical guides were used to perform the digitally supported SS technique. All cases were placed and surgically performed by one operator (Padro M. Trigo).

Results: Progressive digital SS models were superimposed to post-operative models to assess soft tissue changes. Pre and post surgical tissue were used to assess the soft tissue. Results after 12 months of active healing (12-18 months) were compared with case planning or treatment performed measurements.

Conclusion: The digitally supported guided SS technique enables predictable immediate implant placement positions and stable buccal peri-implant soft and hard tissues over time.

Keywords: immediate implant, dental regeneration, endosseous, socket shield technique, surgery

CONCLUSION

Within the limits of this case series, the digitally planned guided socket-shield technique enables predictable immediate implant placement positions, facilitates the SS technique, and results in stable peri-implant soft and buccal hard tissues, at relatively short periods of time (5–42 months).

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Step by Step

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Socket Shield Technique

From a CBCT, measure the length of the root from the level of the gingiva to the apex.

Drill with copious irrigation and intermittent pump action until you reach the level of the depth stopper.

Use the long shanked No. 2 drill to section the root from mesial to distal in a sweeping motion that runs from mesial line angle to distal line angle.

Gently remove the palatal portion of the root by luxating motion.

Once the palatal portion has been removed the apical portion needs to be addressed. The root apex and any gutta percha material must be removed using the No. 3 round drill.

Use the No. 4 finishing diamond drill in the final preparation of the shaping and smoothing of the shield.

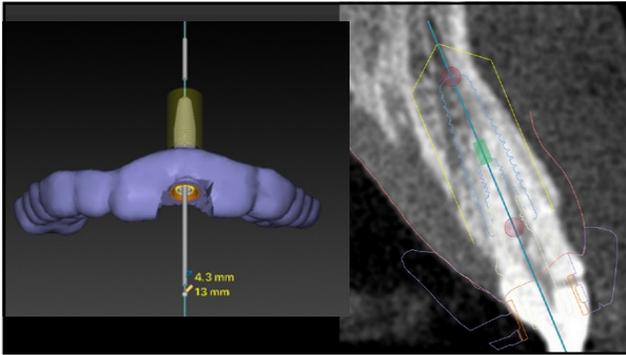
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Use the No. 3 round drill to reduce the coronal portion as close to the crest of the bone as possible.

Use the No. 5 Final Shaper Drill for final preparation and reduction of the coronal portion.

The No. 6 guided chamfer drill creates the space that allows the soft tissue to grow between the shield and the implant.

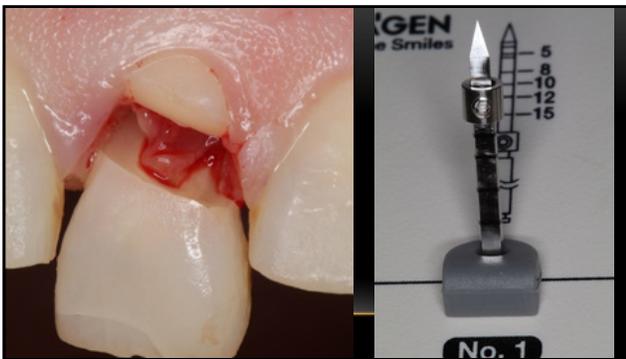
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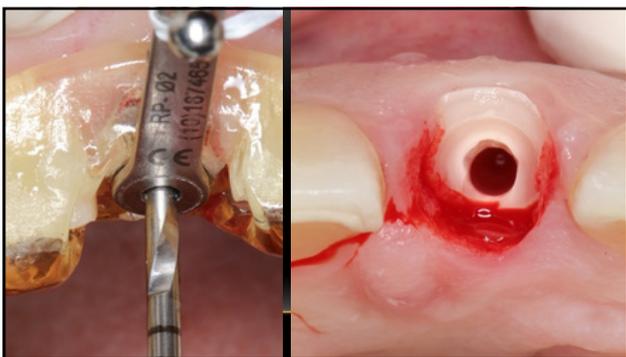
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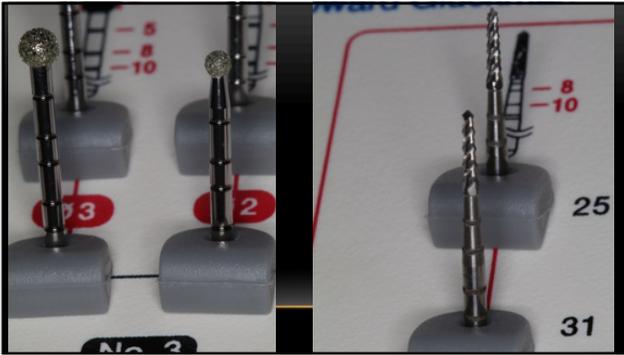
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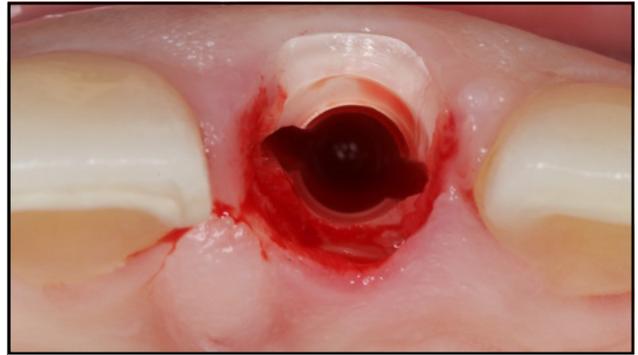
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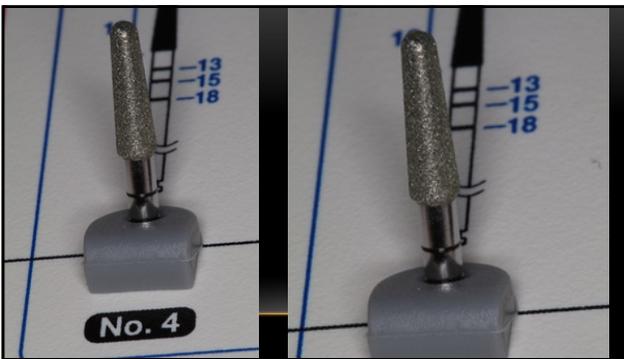
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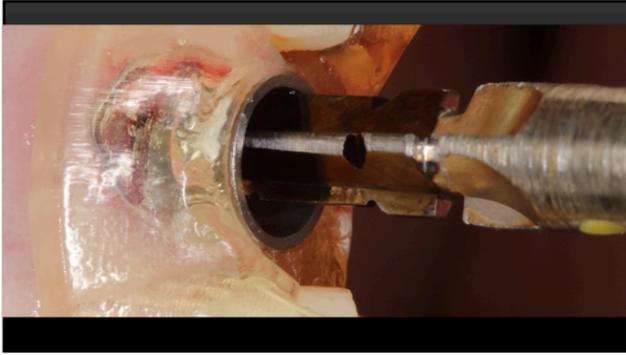
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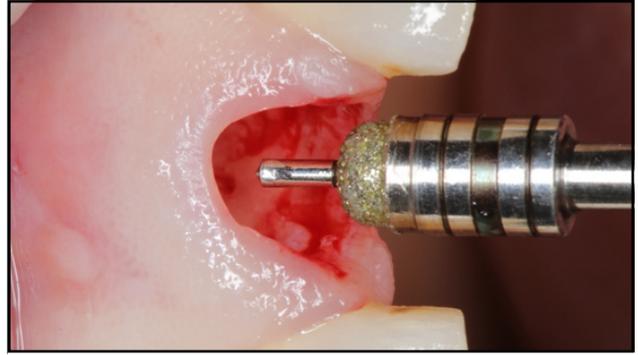
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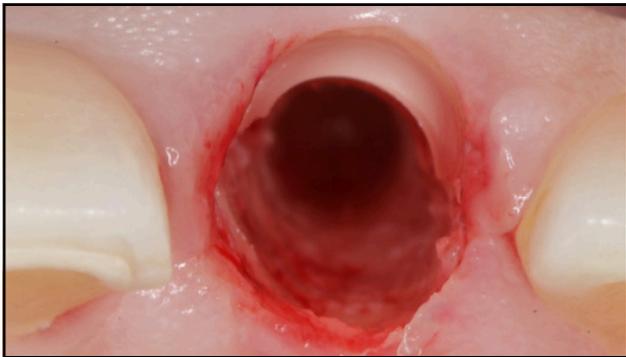
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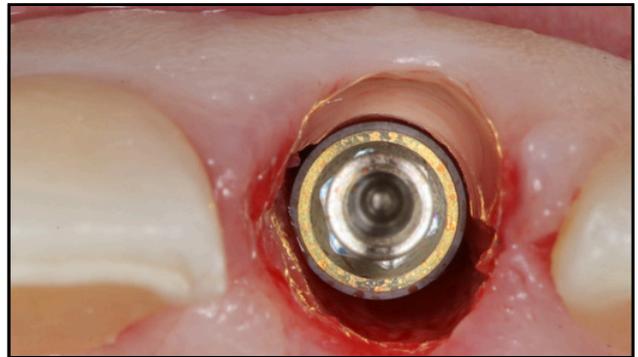
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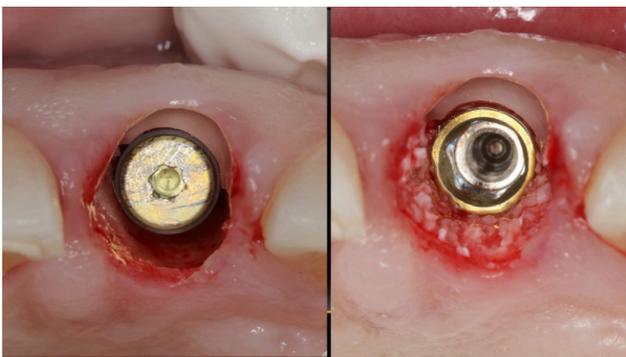
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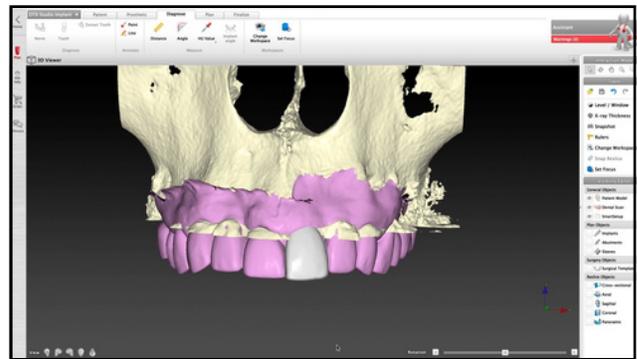
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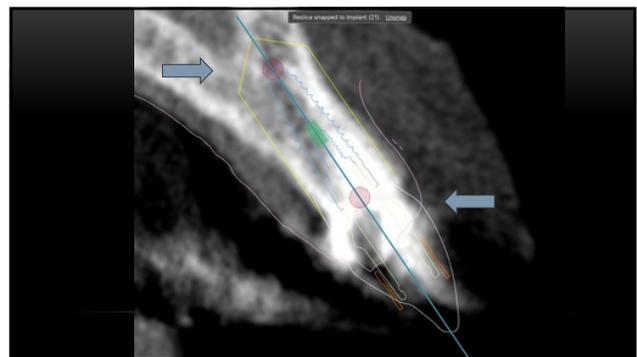
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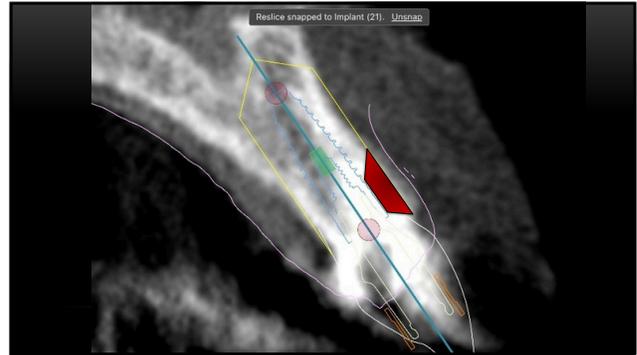
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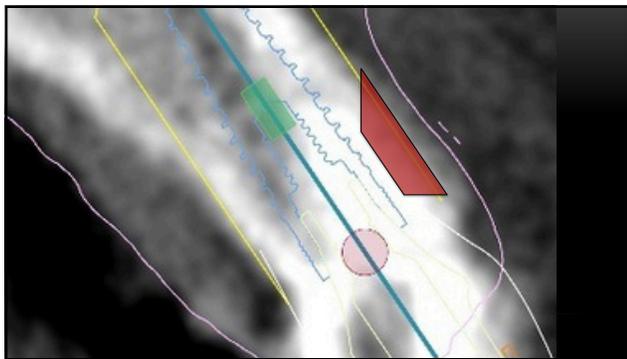
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Facial-lingual

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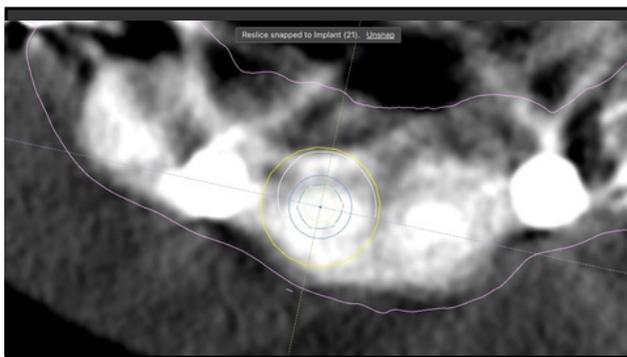
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Mesio-distal

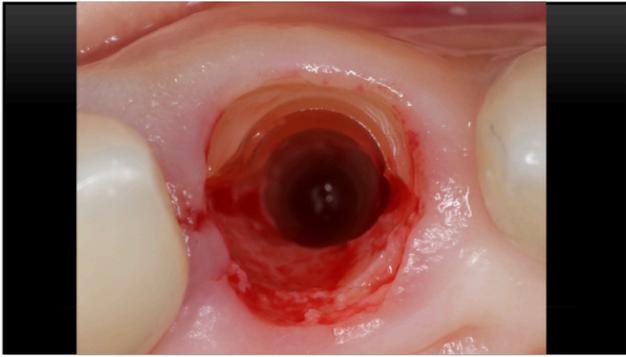
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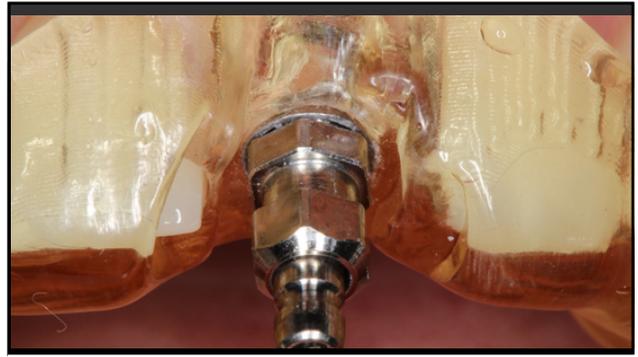
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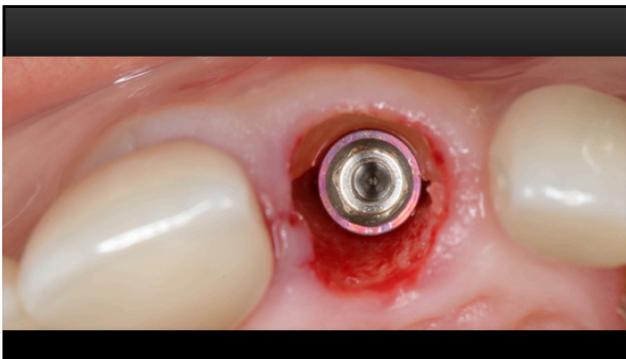
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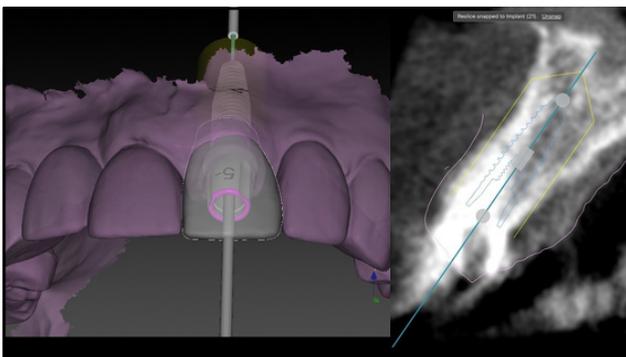
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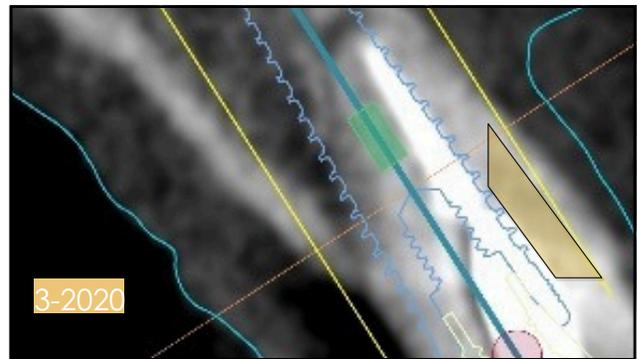
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AGENDA (4)

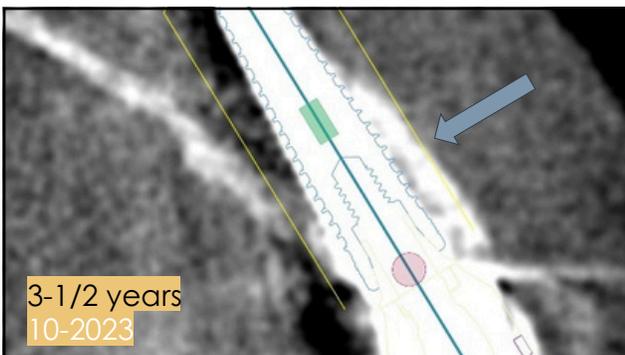
- Angled screw-channel abutments
- Planning socket shields with the DTX studio software
- The socket shield technique, step by step
- Post-op results
- Summary and concluding remarks



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TABLE 1 Gingival thickness change from the pre- and post-op socket shield (SS) models in a horizontal direction at 0, 1, 2, and 3 mm measurement levels, change in height of the free gingival margin, and pre- and post-operative radiographic buccal plate thickness, by case*.

Pt	Th type	Ø/length	Mths	Thickness change Th Δ			GM Change		Xr-BP-Th/Xr-SS-Th
				0 mm	1 mm	2 mm	3 mm	L Δ	
1	11	4.3/13	15	1.50	0.27	0.10	0.02	0.26	0.9/2.8
2	11	4.3/16	10	-1.06	-0.66	-0.07	0.15	0.28	0.7/2.9
3	8	4.3/11.5	15	0	-0.51	-0.60	-0.49	-0.54	0.6/0.7
4	11	4.3/13	17	-0.56	-0.71	-0.37	-0.27	-0.57	0.9/2.3
5	8	4.3/13	15	0.99	0.72	0.65	0.50	0.58	0.8/1.7
6	9	4.3/13	5	-0.48	-0.61	-0.53	-0.33	0.19	0.9/2.1
7	10	4.3/16	42	-0.16	-0.36	-0.19	-0.11	0.11	0.7/1.9
Mean \pm SD				0.03 \pm 0.83	-0.2 \pm 0.54	0.14 \pm 0.42	-0.07 \pm 0.33	0.04 \pm 0.43	0.78 \pm 0.11/2.04 \pm 0.6

*A negative measurement represents depletion, and a positive one, an increase in tissue thickness or gingival margin height.
Abbreviations: GM, gingival margin; Mths, months; Pt, patient; SD, standard deviation; Th, Tooth; Xr-BP-Th, radiographic buccal plate thickness; Xr-SS-Th, radiographic socket shield thickness.

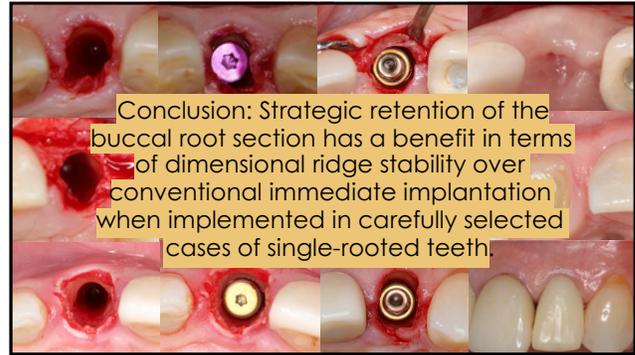
-0.2 mm 0.04 mm 2.04 mm

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CONCLUDING REMARKS

1. Guided surgery for immediate implants in the aesthetic zone is a must.
2. Physiologic changes following immediate implant placement are still a problem.
3. The S-S is a valid and well tested treatment.
4. It results in minimal soft and hard tissue volume changes over time.
5. The S-S technique requires correct planning, expertise and is a sensitive technique.
6. New technological advances reduces the complexity of this technique.

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Conclusion: Strategic retention of the buccal root section has a benefit in terms of dimensional ridge stability over conventional immediate implantation when implemented in carefully selected cases of single-rooted teeth.

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AGENDA (2)

- Socket Shield Introduction
- Wound healing and the SS technique
- Clinical evidence on the SS technique
- The socket shield technique, why?
- long-term results
- Hands-on exercise**
- Course closure Q&A



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