



Anterior Esthetic Implant-supported Fixed Prostheses With Customized PEEK Healing Abutments: a Case Report

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INTRODUCTION

- For an anterior implant supported fixed prostheses of partially edentulous anterior teeth, aesthetic problems may arise due to a recession of surrounding gingiva and an exposure of metal. Recently, in order to improve the aesthetics of anterior implant prosthesis, Polyetheretherketone(PEEK) abutment, one of the high-functional polymers with a high biocompatibility, has been developed and attempted to replace the titanium abutment. PEEK also induces the attachment and proliferation of fibroblasts, affecting the healing of the gingiva and the formation of an ideal emergence profile of soft tissue. The aim of this case report is to produce customized PEEK healing abutment for the ideal gingival formation which is fitted well for the final restoration. The soft tissue formation around implants was precisely transferred to a final prosthesis by double scanning technique.

CASE PRESENTATION

CASE 1) Mx anterior teeth

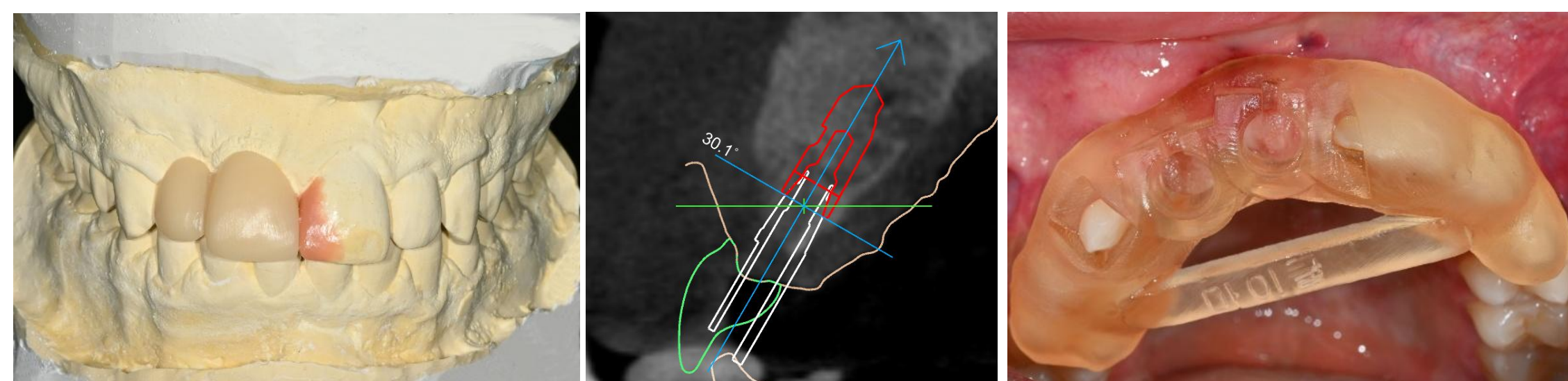


- **Age/Sex/Nationality:** 24Y / M / Ethiopia
- **CC:** I want to have an implant surgery.
- **PDH:** Ext of #11,12 1yr ago
Radicular cyst enucleation & bone graft 1yr ago

• Problem list

	Esthetic consideration	Treatment plan
	Ideal width/length ratio Except for #21	1.04mm resin build up for mesial side of #21
	Midline discrepancy	Golden ratio 1.6:1:0.7
	Gingival discoloration(melanin) Thick biotype gingiva, partially thin	PEEK abutment for healing & gingival molding

- **Diagnostic wax-up & Implant planning**
(R2 Gate, Megagen Imp., Daegu, South Korea)



- CAD/CAM fabrication of PEEK healing abutment
(3Shape Trios 4, 3Shape, Copenhagen, Denmark)
(Polyetherether ketones, Evonik Korea, Seoul, South Korea)



Modified PEEK surface
→ Positive impact on viability,
adhesion, migration and
proliferation of human gingival
epithelial keratinocytes
In Vitro Effect of Modified Polyetheretherketone
(PEEK) Implant Abutments on Human Gingival
Epithelial Keratinocytes Migration and Proliferation
Materials 2019, 12, 1401.

- Double scanning for gingival transition
(DentalCAD 3.0 Galway, exocad GmbH, Darmstadt, Germany)



- Definitive restoration with Ti-base PEEK abutment



Mean Pink Esthetic Score of #11,12		Mean White Esthetic Score of #11,12	
Mesial papilla	1.5	Tooth form	1.5
Distal papilla	1.5	Outline/volume	1.5
Curvature of facial mucosa	2	Color	2
Level of facial mucosa	1.5	Surface texture	2
Root convexity	1	Translucency/characterization	1
Soft tissue color & texture	1		
score	7.5	score	9

CASE 2) Mn anterior teeth

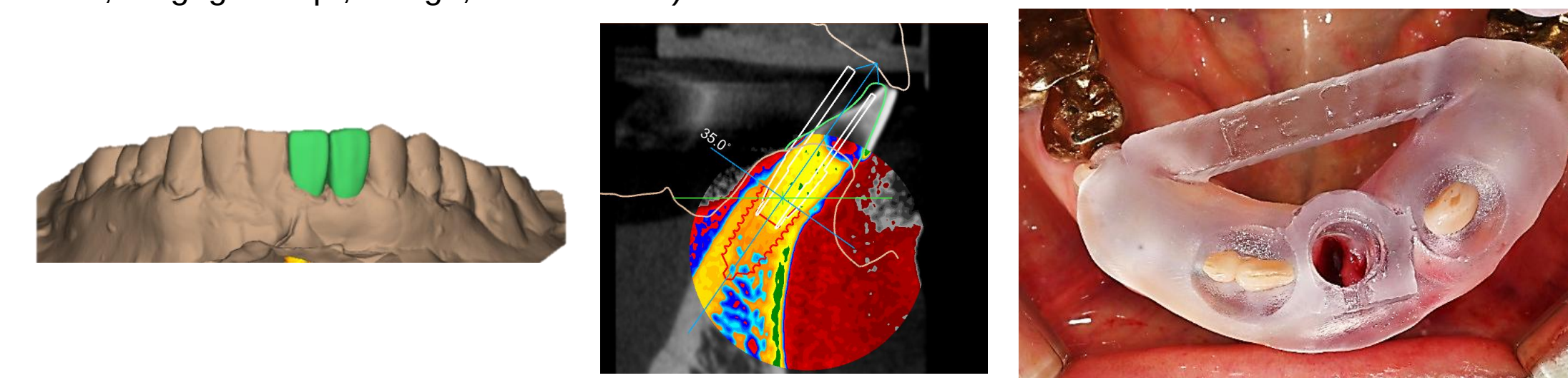


- **Age/Sex:** 56Y / F
- **CC:** I have a broken tooth because of a dental caries.
- **PMH:** SLE, Hypothyroidism on med(+) for several years
- Problem list



Esthetic consideration	Treatment plan
#31 deep distal caries	#31i= cantilever restoration
Insufficient MD width	
Large black triangle d/t gingival recession	Similar to Rt side
Thin biotype	PEEK abutment for healing & gingival molding

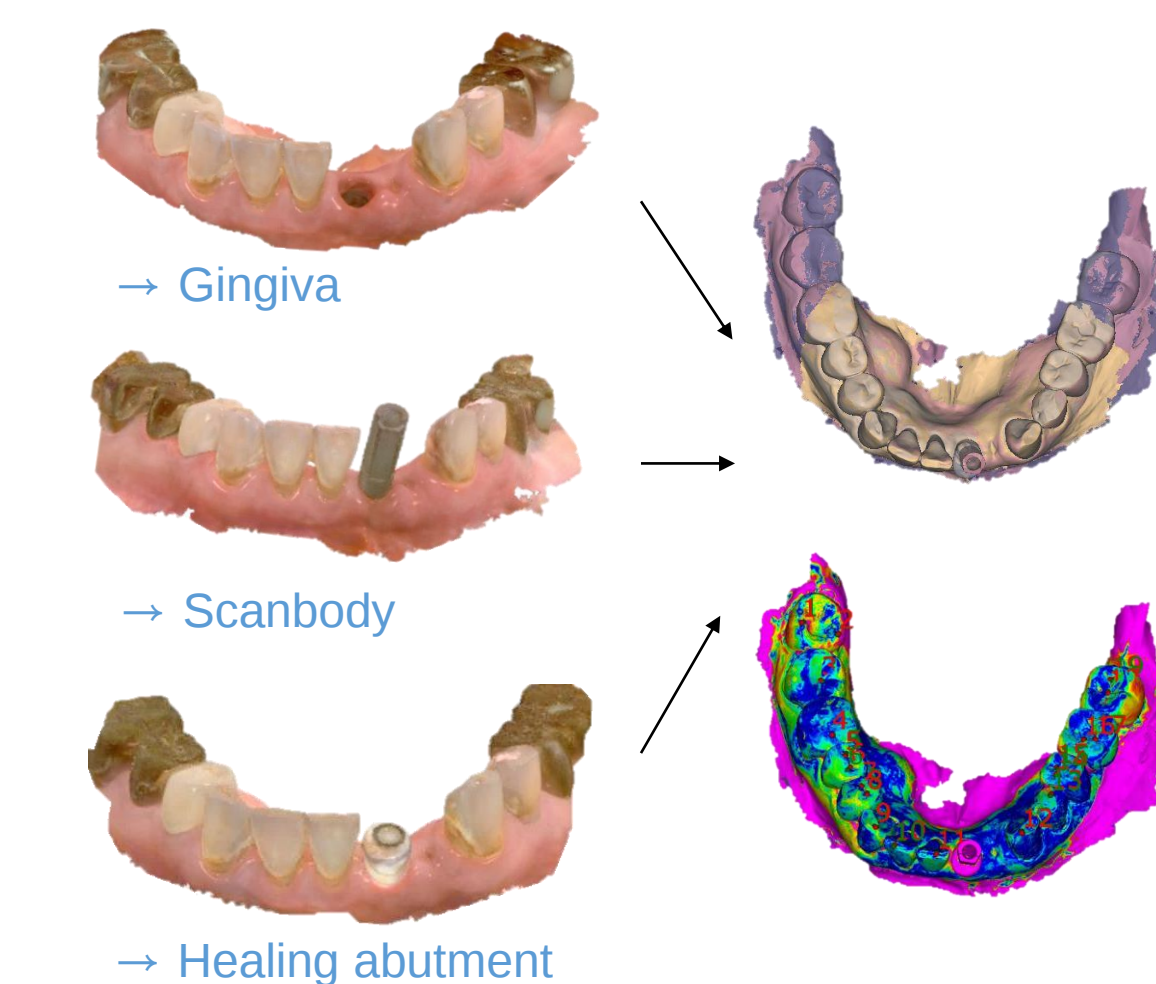
- **Diagnostic wax-up & Implant planning**
(R2 Gate, Megagen Imp., Daegu, South Korea)



- CAD/CAM fabrication of PEEK healing abutment
(3Shape Trios 4, 3Shape, Copenhagen, Denmark)



- Double scanning for gingival transition
(3Shape Trios 4, 3Shape, Copenhagen, Denmark)



A CAD software combines
all the scans and it generates
a high precision virtual model
where the dental technician can
identify the **real profile of the
soft tissue**.

Copy-paste concept: Full digital
approach in the management of
gingival emergence profiles
J Esthet Restor Dent.
2023,Dec;35:222-229

- Definitive restoration with Ti-base PEEK abutment

(Zircen HT, Kuwotech, Gwangju, South Korea)
(Visio.link primer, Bredent, Senden, Germany)
(Rely X Ultimate, 3M, Seoul, South Korea)



CONCLUSION

- For an anterior esthetic prosthesis, a customized PEEK healing abutment is appropriate for constructing a profile of gingiva surrounding an implant. The amount of gingival recession of customized PEEK healing abutment is predicted as less than that of anatomic type Ti healing abutment. This case report represents an ideal gingival formation around the customized healing abutment, and it is transferred to a final prosthesis. Therefore, the final prosthesis is functionally and esthetically well fabricated.