Autogenous Connective Tissue Grafts versus Soft Tissue Substitutes : Soft Tissue Augmentation around Teeth and Implants

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INTRODUCTION

Autogenous connective tissue grafts (CTG) are commonly used for root coverage around teeth and for soft tissue augmentation around implants.

In the treatment of gingival recession, CTG combined with a coronally advanced flap (CAF) remains the gold standard, offering predictable root coverage, increased tissue thickness, and long-term stability.

Around implants, several studies have shown that greater peri-implant soft tissue thickness achieved through CTG can reduce marginal bone loss.

Soft tissue substitutes (STS), such as volume-stable collagen matrices, have emerged as less invasive alternatives to CTG. According to recent studies, STSs may yield comparable outcomes to CTG in selected cases, achieving soft tissue stability and esthetic success. The purpose of this case presentation is to **compare the clinical outcomes of CTGs and STSs in root coverage and peri-implant soft tissue augmentation.**

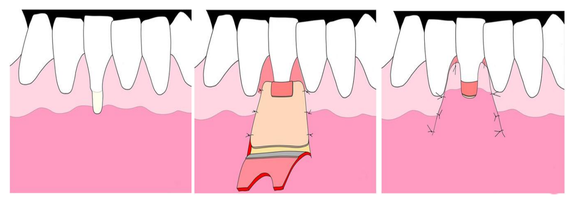


Figure 1. Schematic illustration of gingival recession coverage around teeth (using coronally advanced flap with either CTG or STS).

Figure 2. Schematic illustration of buccal soft tissue augmentation around a dental implant using either a CTG or an STS.

Root coverage

CASE_1 CTG (53/M)

- Gingival recession on #23 (Miller Class I)
- Thick gingival phenotype
- Root coverage was performed using a **connective tissue graft (CTG)**, harvested from the palate, with a coronally advanced flap.
- Complete root coverage was achieved and maintained at 13 years.

(A,B) Pre-operative state
(C,D) CTG harvested from the palatal donor site and placed at the recipient site
(E) Stitch out (POD 2 weeks)
(F) 1 month follow up
(G,H) 6 years follow up
(I,J) 13 years follow up

CASE_2 STS (66/M)

- Gingival recession on #13 (Miller Class I)
- Thick gingival phenotype
- Root coverage was performed using a **soft tissue substitute (Fibro-Gide®, Geistlich)** in combination with a coronally advanced flap.
- Complete root coverage was achieved and maintained at 4 months.

(A,B) Pre-operative state
(C,D) Recepient site preparation and STS adaptation
(E,F) Suture
(G,H) Stitch out (POD 14days)
(I,J) Post-operative state (POD 4months)

Peri-implant soft tissue augmentation

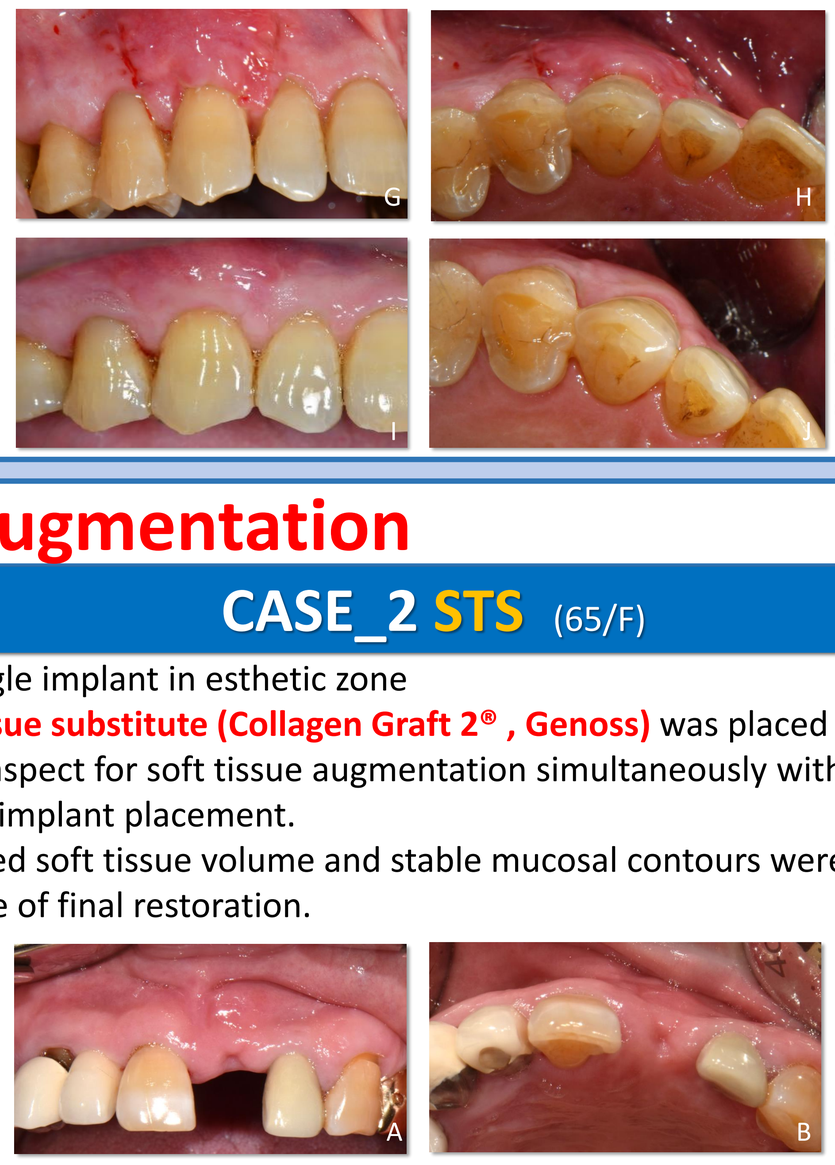
CASE_1 CTG (57/M)

- #21 single implant in esthetic zone
- **Connective tissue graft (CTG)** was harvested from the palate and grafted onto the buccal aspect of the implant simultaneously with GBR at the time of implant placement.
- Increased soft tissue volume and stable mucosal contours were observed at the time of final restoration.

(A,B) Pre-operative state
(C,D) CTG with GBR at implant placement
(E,F) Suture
(G,H) Healing abutment connection
(I,J) Final prosthesis

CASE_2 STS (65/F)

- #21 single implant in esthetic zone
- **Soft tissue substitute (Collagen Graft 2® , Genoss)** was placed on the buccal aspect for soft tissue augmentation simultaneously with GBR at the time of implant placement.
- Increased soft tissue volume and stable mucosal contours were observed at the time of final restoration.



(A,B) Pre-operative state
(C,D) STS placement with GBR at implant placement
(E,F) Suture
(G,H) Healing abutment connection
(I,J) Final prosthesis

DISCUSSION & CONCLUSION

Both CTGs and STSs resulted in favorable clinical outcomes in root coverage and peri-implant soft tissue augmentation. In root coverage cases, both approaches achieved complete root coverage with increased soft tissue thickness; in peri-implant sites, they led to visible volume gain and stable mucosal contours at the time of final restoration. **STSs offer advantages such as reduced surgical time and elimination of donor site morbidity**. They may be **a practical alternative for patients unwilling to undergo palatal harvesting, those with systemic conditions affecting wound healing, or when minimizing surgical invasiveness is preferred**. However, potential limitations such as shrinkage of the material highlight the need for careful case selection. **Careful case selection and long-term follow-up are essential**, especially when using STSs.