Clinical decision-tree for esthetic maxillary anterior implant

Eunchong Lee[1], Eun-Kyoung Pang[1,2]

[1]Department of Periodontology, Ewha Womans University Mokdong Hospital

[2]Department of Periodontology, College of Medicine, Ewha Womans University

INTRODUCTION

The anterior maxillary region presents unique challenges for implant therapy, requiring both functional success and esthetic excellence. Studies have shown that buccal bone thickness and soft tissue volume are critical factors influencing long-term peri-implant tissue stability. A buccal bone thickness of at least 2.0 mm and a thick soft tissue biotype are associated with reduced marginal bone loss and mucosal recession. Therefore, careful preoperative assessment of these parameters is essential. A clinical decision tree incorporating bone and soft tissue evaluation offers a structured framework for planning implant placement and regenerative procedures. This poster presents a case series applying this decision-tree based approach to optimize esthetic outcomes and peri-implant tissue stability in the anterior maxilla.

DECISION-TREE

Edentulous anterior maxilla

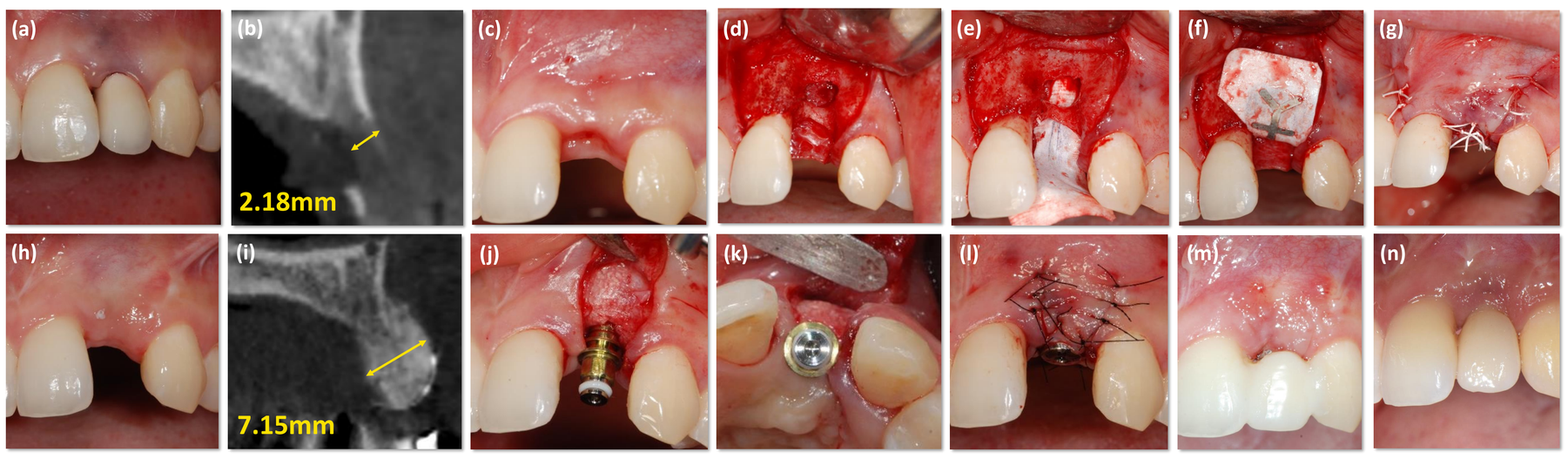
- **Inadequate alveolar bone width** (***< 2mm*** *of buccal bone width following implant placement*)
  - Ridge augmentation with **GBR** (guided bone regeneration) **prior** to implant placement → **Case 1**
  - Implant placement **with GBR** → **Case 2**
- **Adequate alveolar bone width** (***≥ 2mm*** *of buccal bone width following implant placement*)
  - Placement of **CTG** (connective tissue graft) **during** implant surgery → **Case 3**
  - **Roll flap technique during** 2nd stage surgery → **Case 4**

Ioannou, Andreas L., et al. "Soft tissue surgical procedures for optimizing anterior implant esthetics." International journal of dentistry 2015.1 (2015): 740764.

Case 1: Ridge augmentation with GBR prior to implant placement

- 30/F
- PMH: N/S
- PI: #22: PPD (733/743), BOP(+)
- Tx plan:
  1) #22 ext 2) #22 GBR 3) #22i imp sx

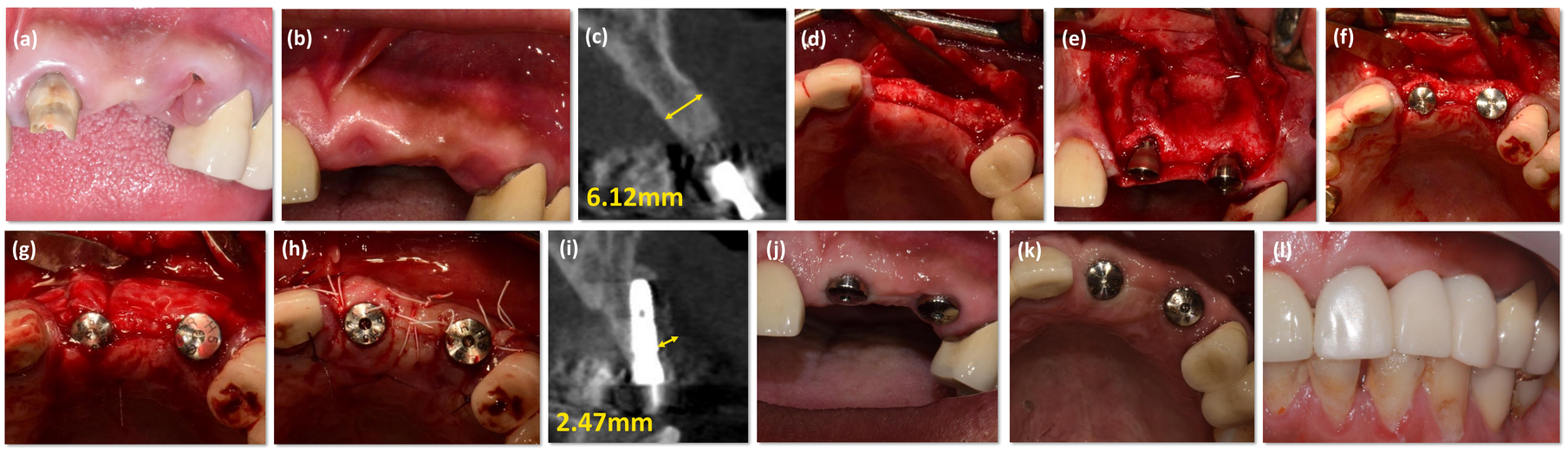
(a) Pre ext
(b) - (c) Pre GBR (POD 3m)
(d) - (g) Peri GBR *(Geistlich Bio-oss 0.25g)*
(h) - (i) Pre implant sx (POD 6m)
(j) - (l) peri implant sx *(osstem TS III 3.5*13)*
(m) POD 2w
(n) POD 2yrs



Case 2: Implant placement with GBR

- 49/M
- PMH: N/S
- PI: #21,23 mob(++), secondary caries
- Tx plan:
  1) #21,23 ext with ARP (alveolar ridge preservation)
  2) #21i,23i imp sx with GBR(#21i)

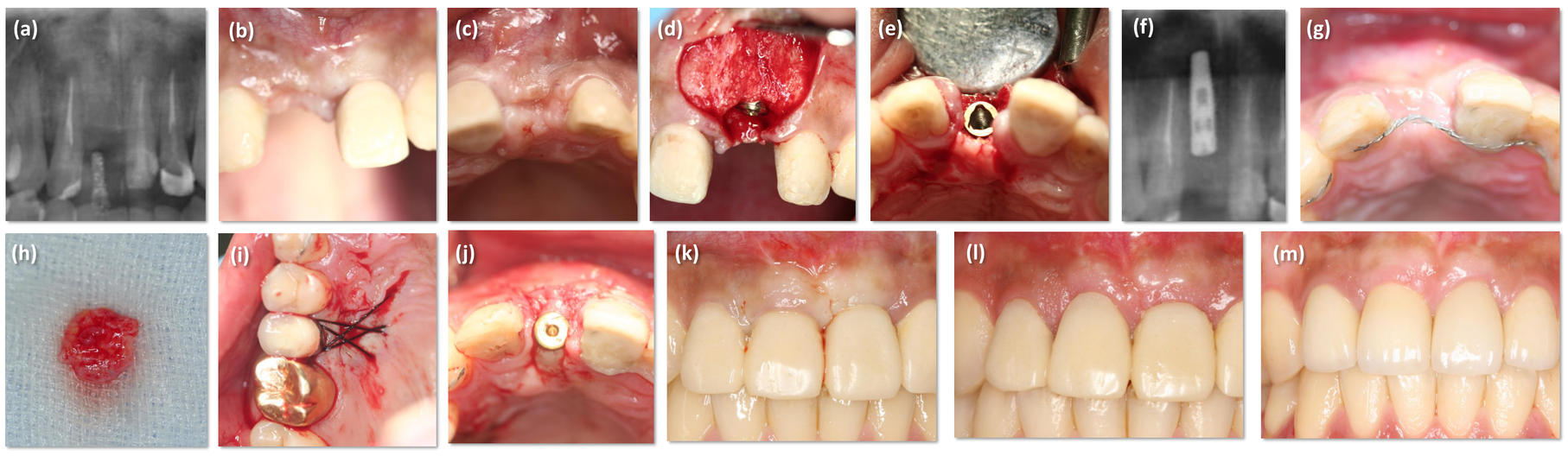
(a) Pre ext (b) - (c) Pre implant sx (POD 2m)
(d) - (h) Peri implant sx with GBR
*(osstem TSIII 4.0*11.5, Geistlich Bio-oss 0.5g)*
(i) Post implant sx
(j) - (k) POD 6w
(l) POD 7m



Case 3: Placement of CTG during implant surgery

- 24/M
- PMH: N/S
- PI: #11 extracted state due to root fx
- Tx plan:
  1) #11i imp sx with CTG

(a) - (c) Pre implant sx
(d) - (e) Peri implant 1st op
*(Nobel Biocare RST 4.3*13)*
(f) Post implant sx
(g) - (j) implant 2nd op & CTG (POD 6m)
(k) POD 4m (l) POD 6m (m) POD 10m



Case 4: Roll flap technique during 2nd stage surgery

- 47/M
- PMH: Arrhythmia
- PI: #11 trauma hx, mob(+++), PPD 9~12mm
- Tx plan:
  1) #11 ext with ARP 2) #11i imp sx

(a) Pre ext (b) - (d) pre imp sx (POD 3m)
(e) - (g) Peri implant 1st op
*(Straumann BLT 4.1*10)*
(h) Post implant sx
(i) - (k) peri implant 2nd op with roll technique (POD 3m)
(l) – (m) POD 3m

DISCUSSION & CONCLUSION

This case series highlights the value of a decision tree-based approach for anterior maxillary implant planning, integrating buccal bone thickness and soft tissue assessment to optimize esthetic and functional outcomes. Although the protocol recommends CTG at implant placement when needed, in 3rd case, CTG was performed at the second-stage surgery. Recent evidence supports this timing as effective for improving peri-implant soft tissue volume and esthetics, allowing targeted interventions after hard tissue healing (Thoma, 2022). Overall, individualized planning combined with flexible application of evidence-based protocols is key to achieving long-term esthetic success. Further research is needed to refine the optimal timing of soft tissue augmentation.