

Advanced Surgical Techniques

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Learning Objectives

- Describe the classification of alveolar ridge deformities
- Describe the principles of ridge augmentation
- Discuss different techniques used for ridge preservation and augmentation procedures
- List different biomaterials used in advanced grafting procedures

Extraction and Socket Grafting (Ridge preservation)

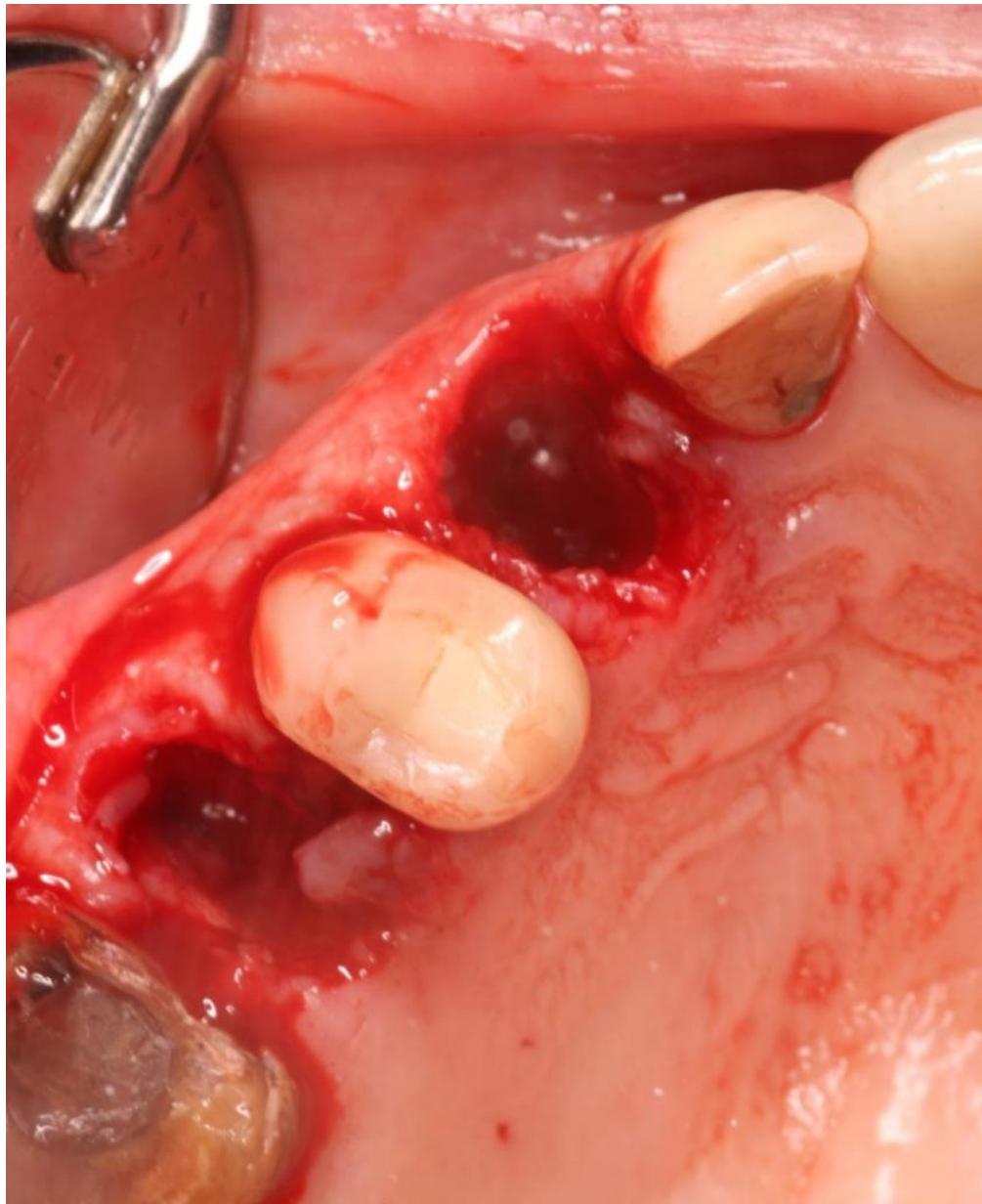
Immediate vs delayed Implant Placement

Case Scenario 1

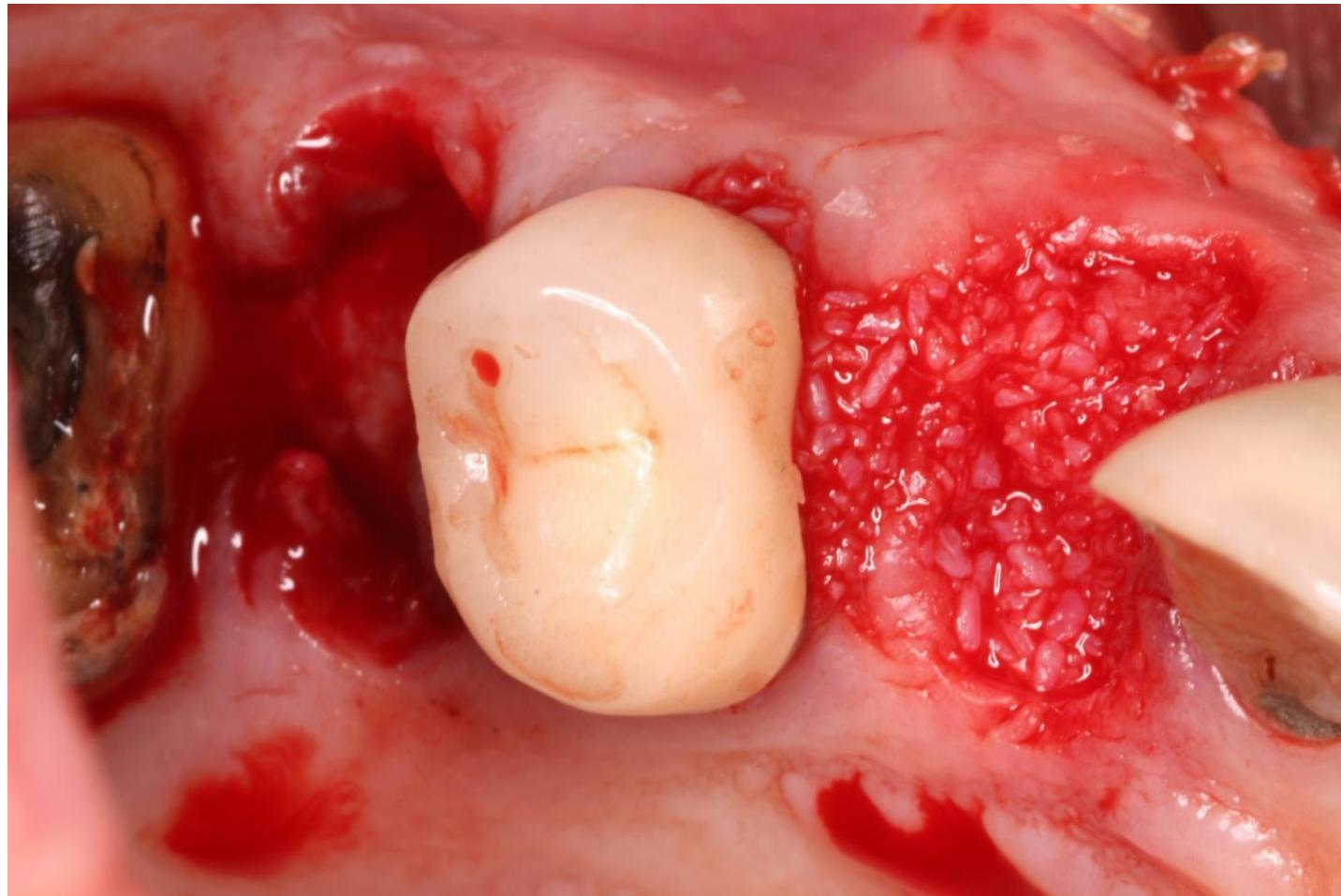




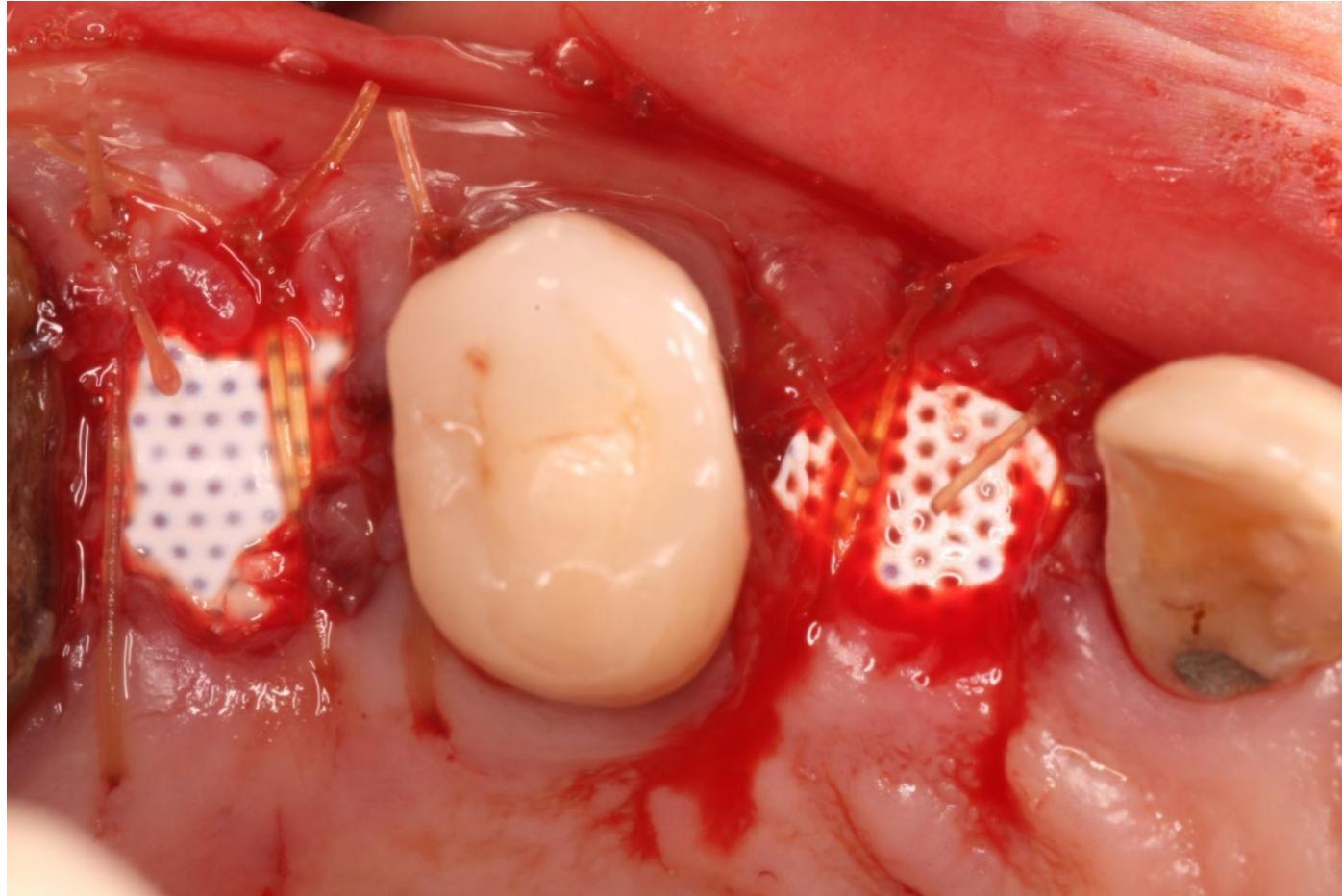
Extractions



Bone graft in place



Membranes placed



Membrane Removal



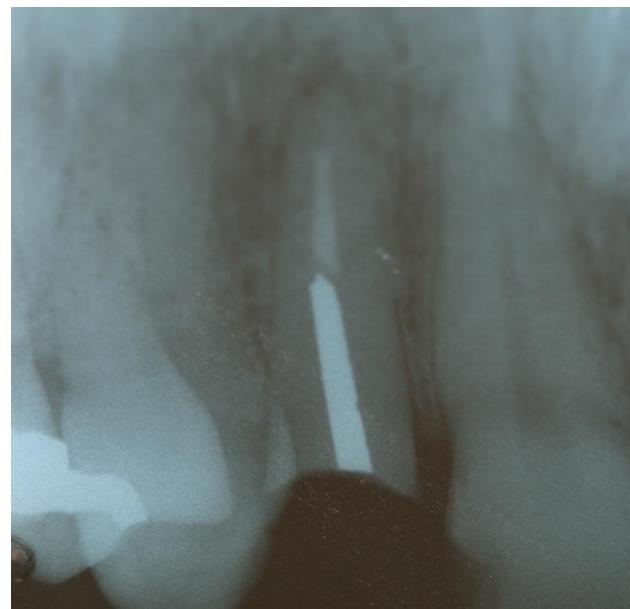
Site Healed



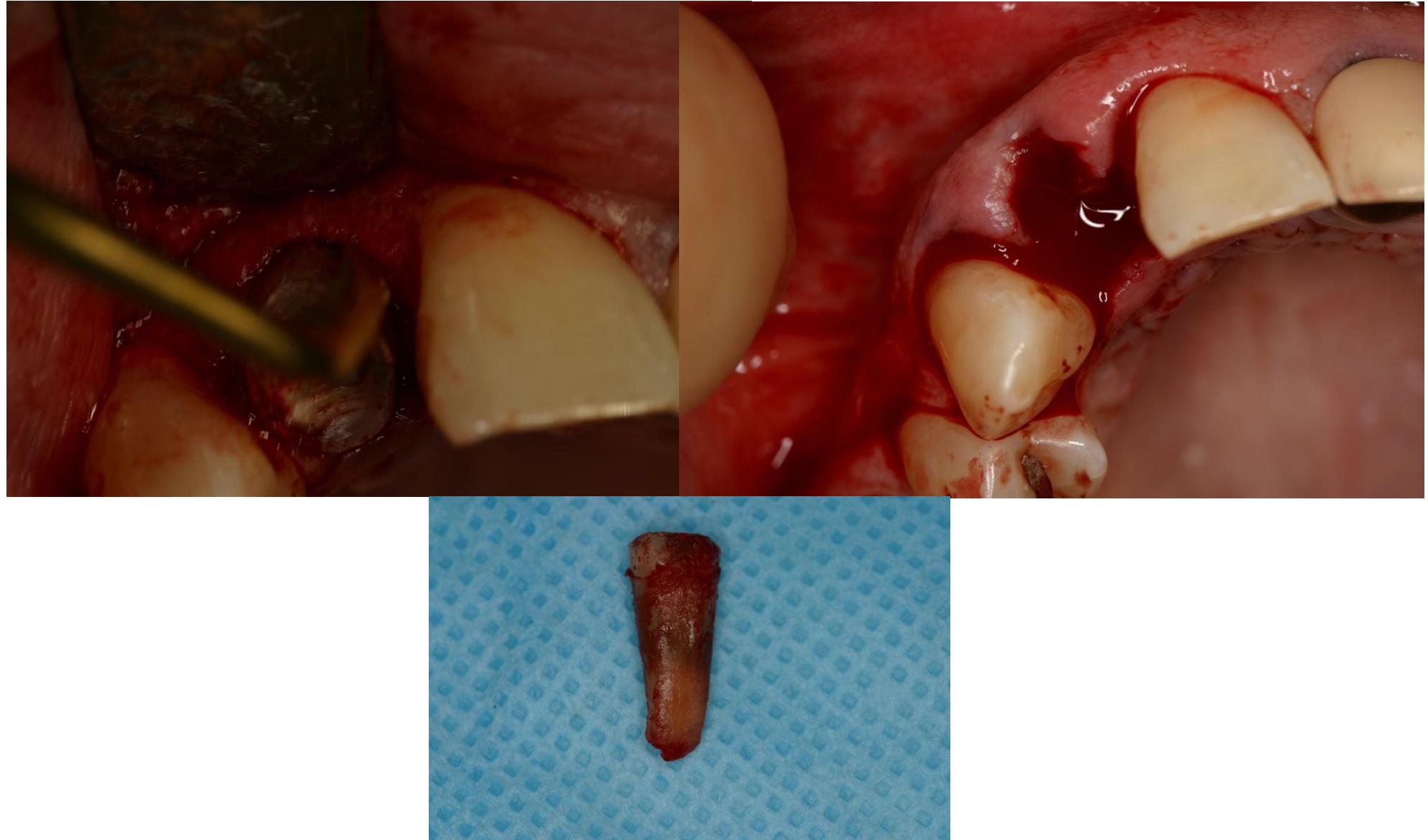
Ridge preservation

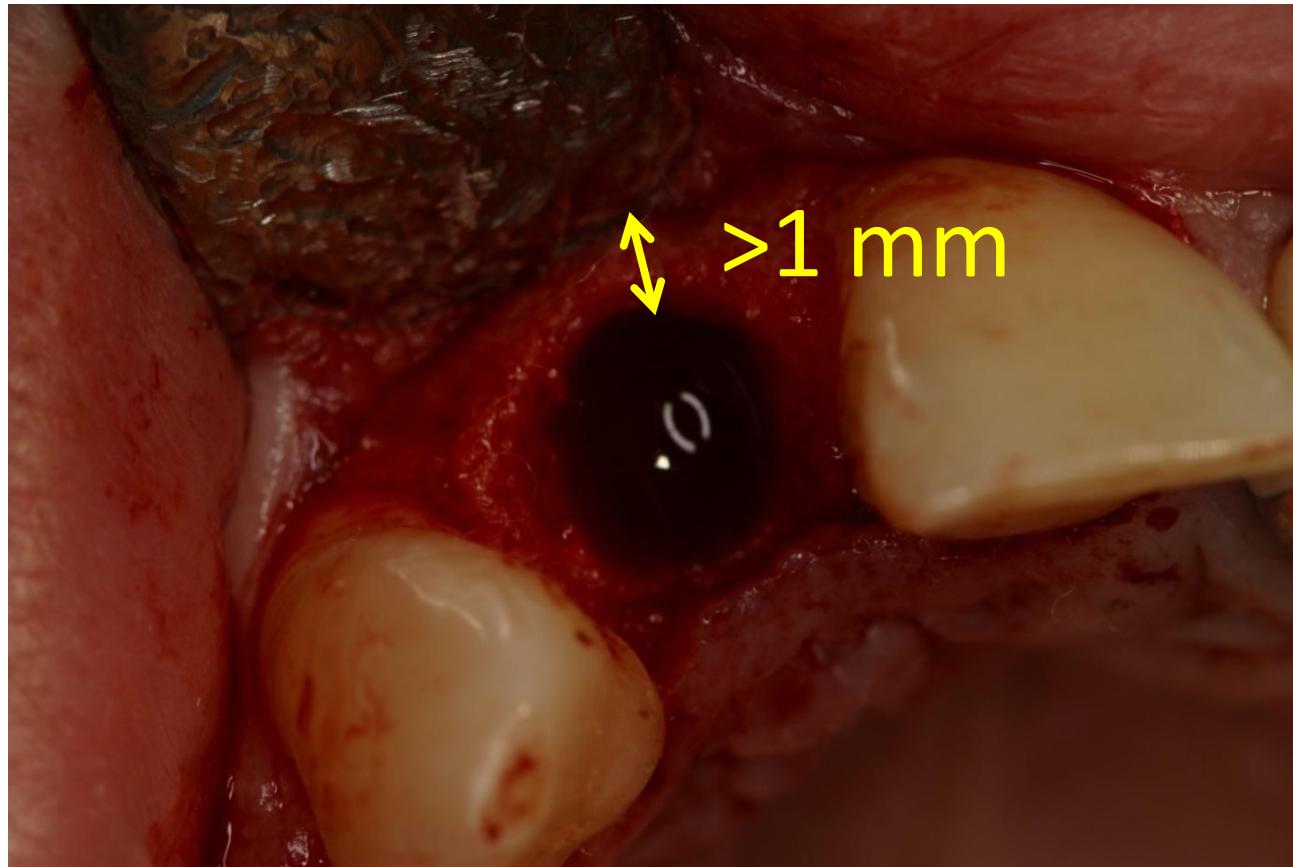
- Socket graft
 - Freeze-dried bone allograft (FDBA), MinerOss™ (Biohorizons), Puros™ (Zimmer)
 - Cytoplast™ (Osteogenics), Biomend™ (Zimmer)
- Membrane – Resorbable/ Non-resorbable
- 3 months of healing
- Implant placement

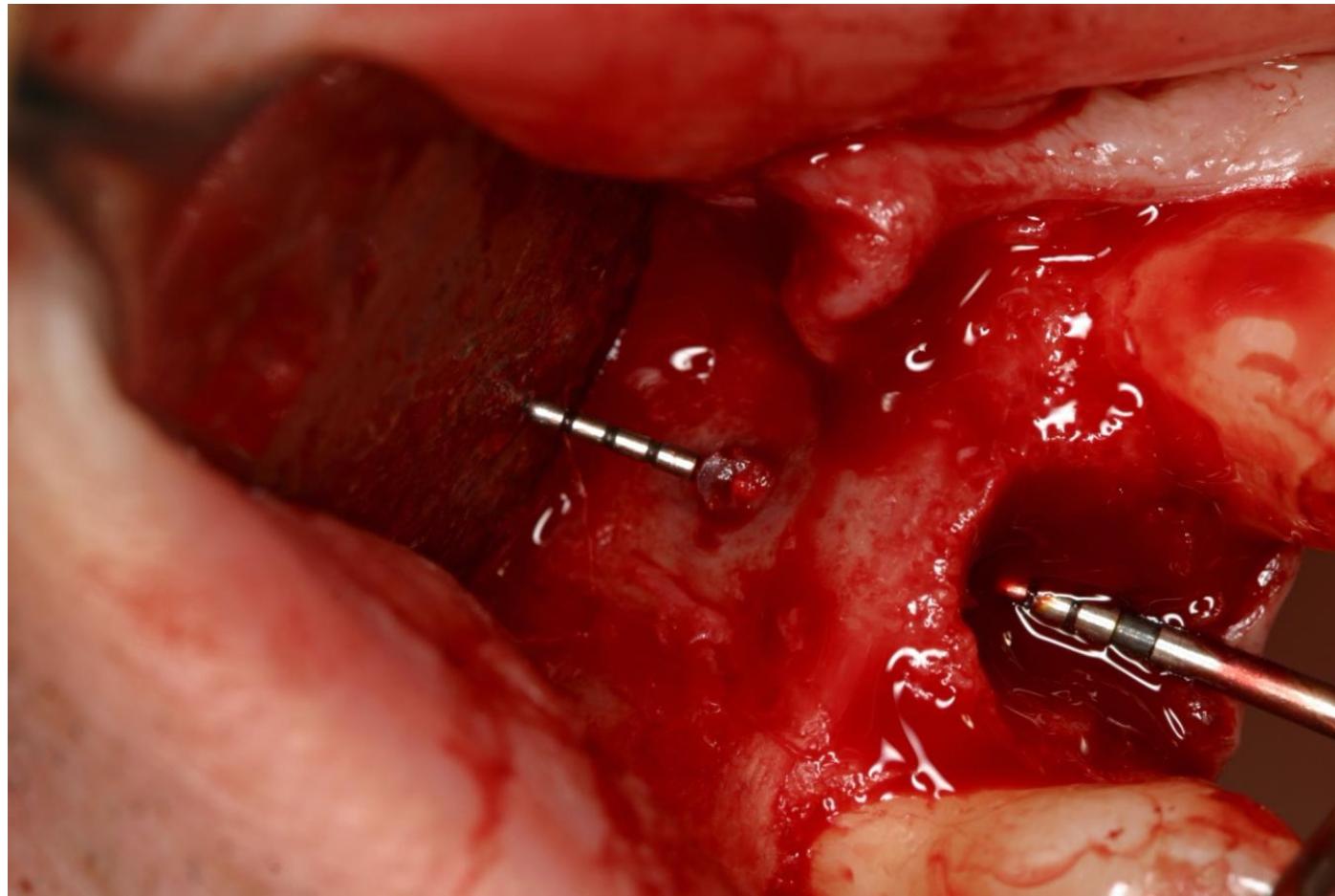
Case Scenario 2



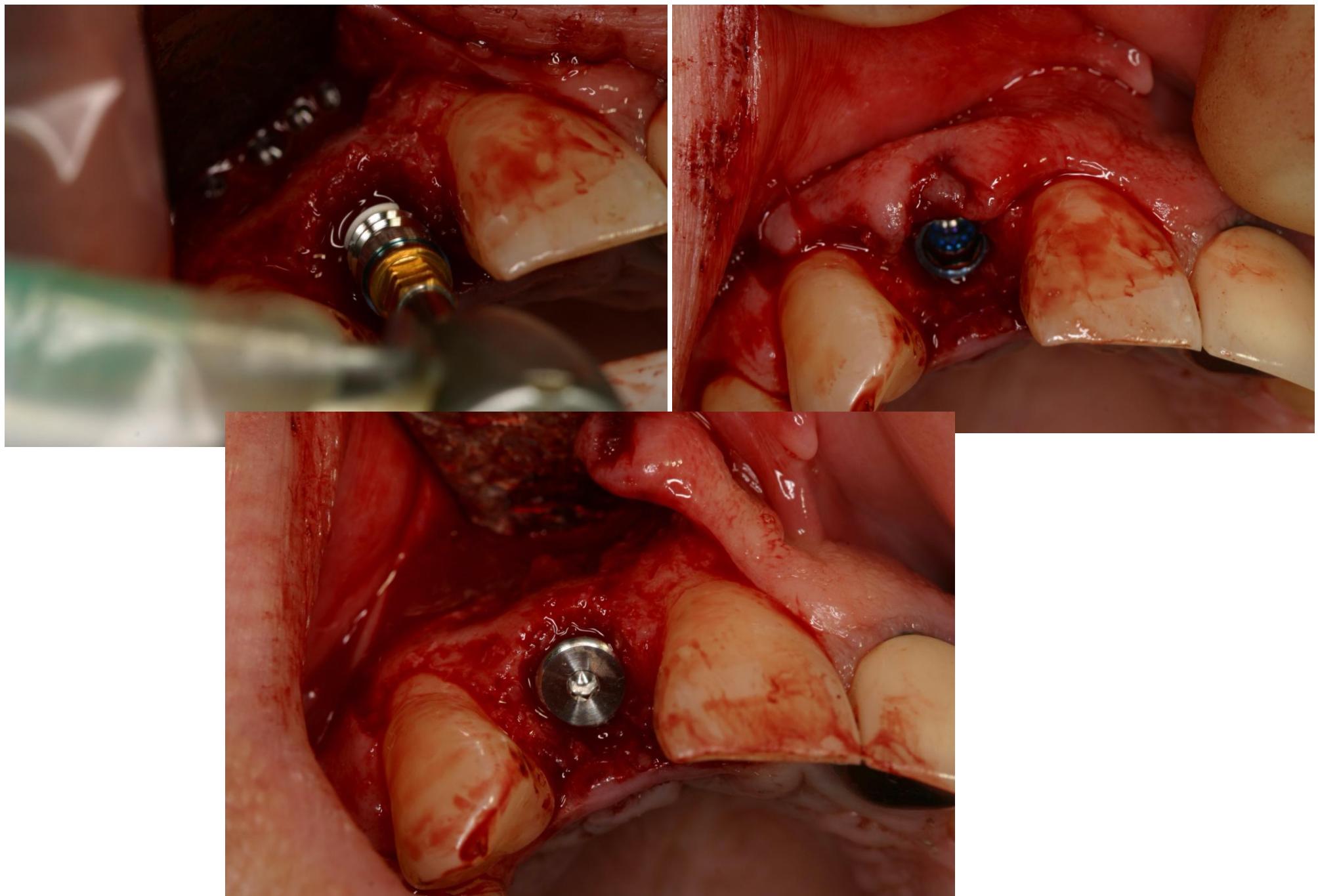
Atraumatic Tooth Extraction



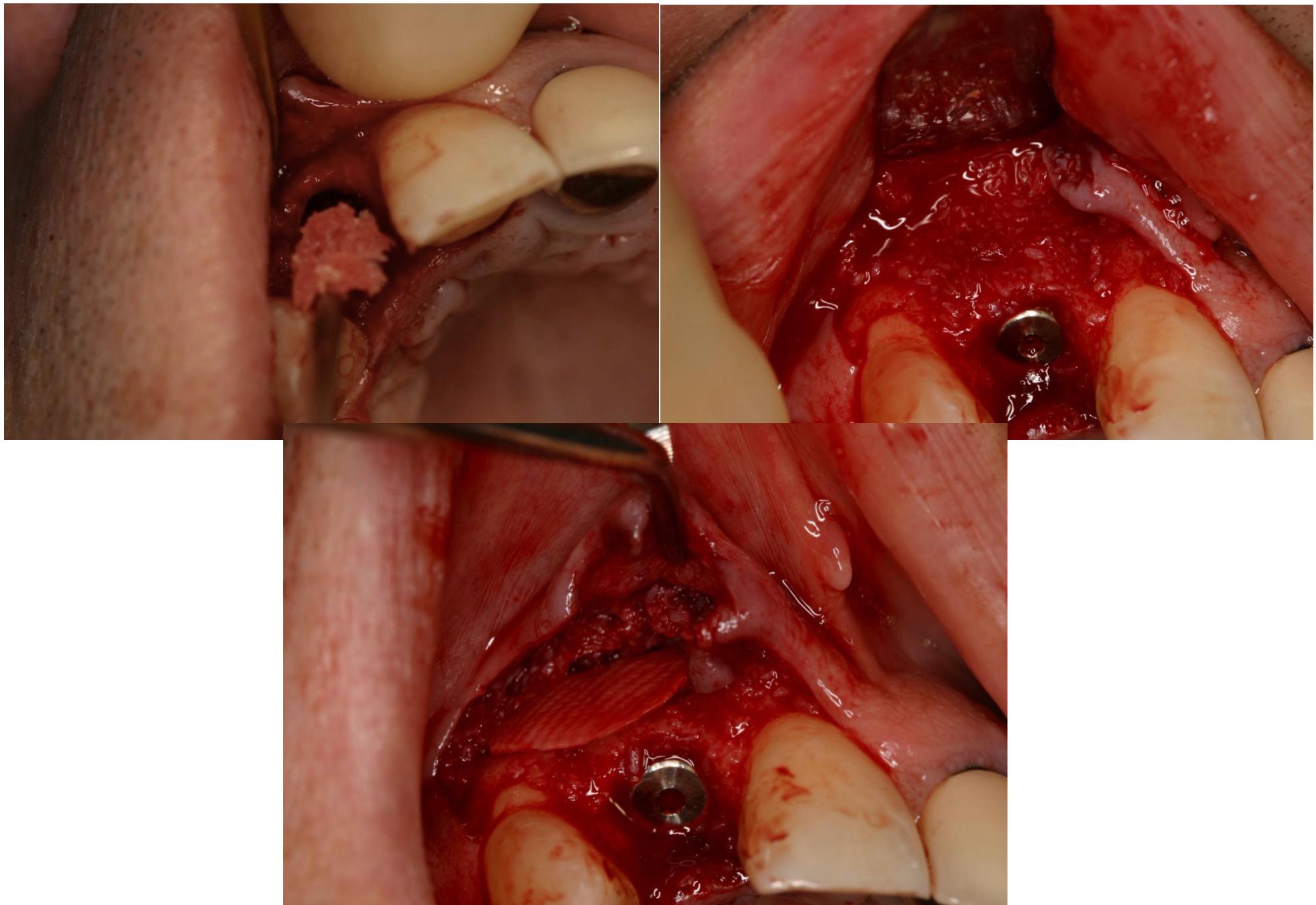




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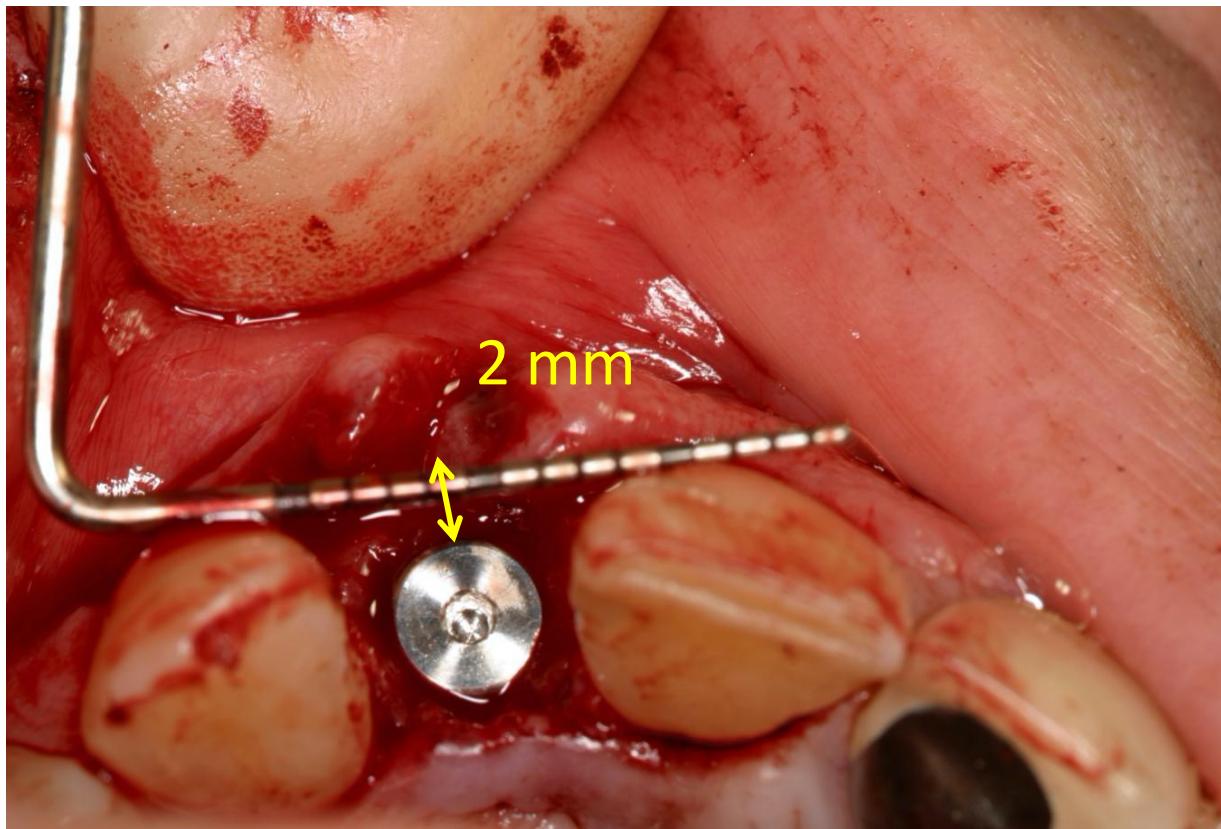


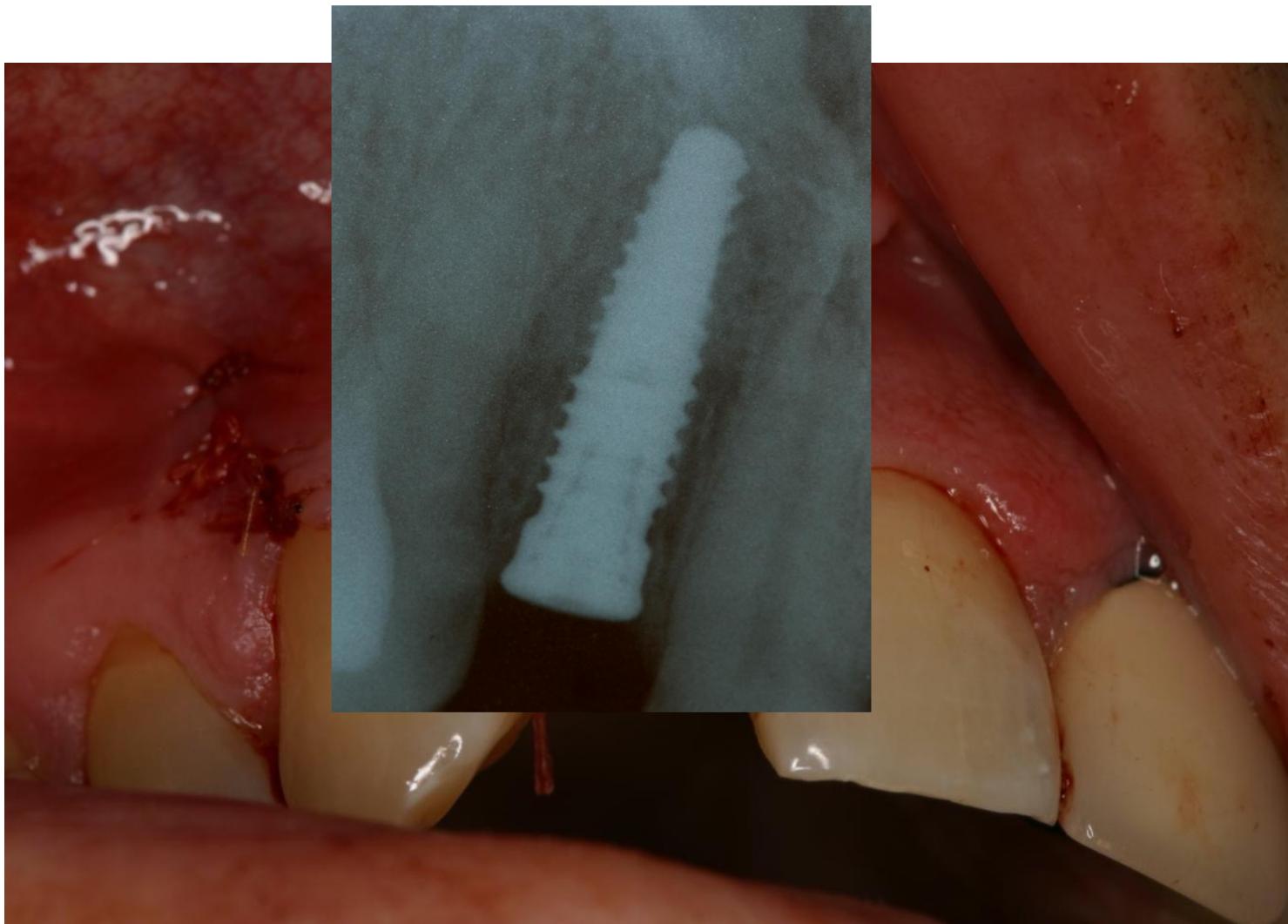
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When to Graft?



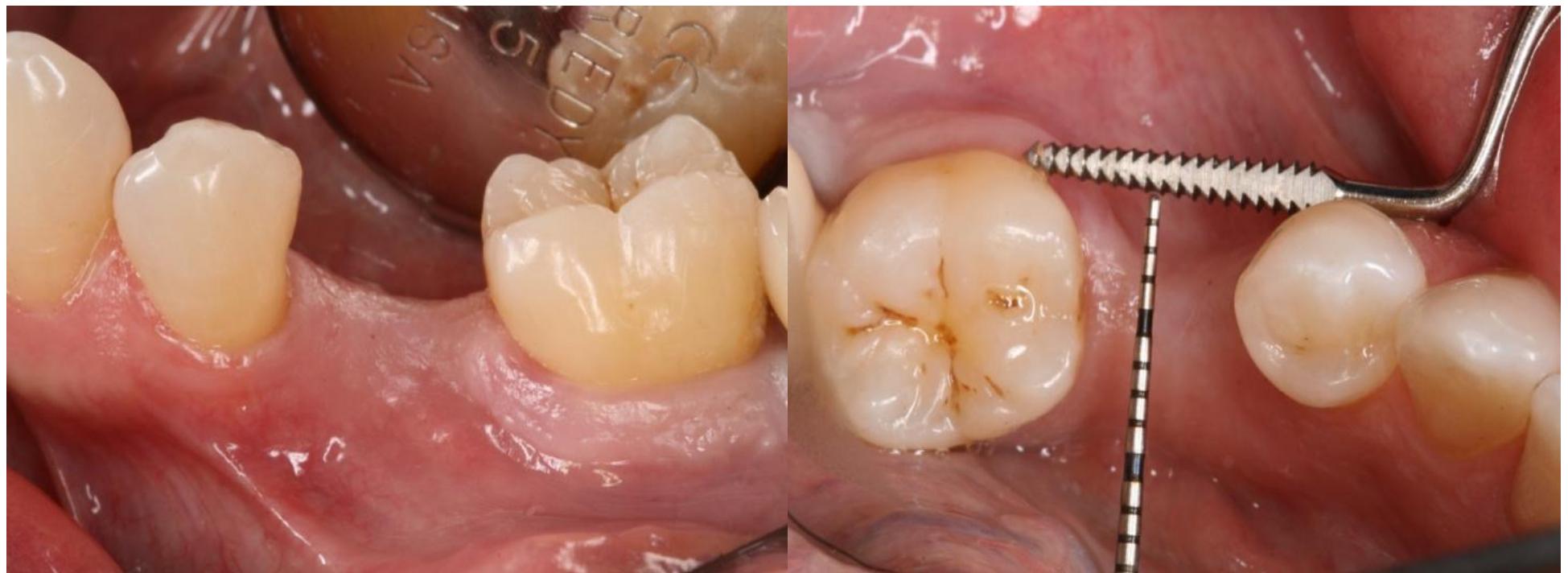


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Ridge Deformities

Seibert Classification

Class I: Buccolingual loss of tissue contour with a normal apicocoronal height



Seibert Classification

Class II: Apicocoronal loss of tissue with normal buccolingual contour



Seibert Classification

Class III: A combination of buccolingual and apicocoronal loss



Soft Tissue Objectives

- Adequate zone of keratinized tissue surrounding the implant abutment
- Soft tissue thickness on facial of implant
- Papillae preservation/augmentation
- Esthetic symmetry

Soft Tissue Grafting Options

- Free gingival
- Connective tissue
- Pedicle
- Semi-lunar
- Acellular dermal tissue

Bone Augmentation

- Horizontal augmentation (building ridge width) is more predictable than vertical augmentation (ridge height)
- Best to augment bone before implant placement
- Augmentation technique dependent on size and shape of defect

Guided Bone Regeneration

How much bone is enough?

- Buccal-lingual dimension: Implant diameter plus buccal and lingual bone of at least 1 mm
- Vertical height: implant length plus 2 mm safety zone to vital structures (e.g. nerve, sinus)

Necessary for regeneration

- Cell source – multi-potent stem cells from marrow;
minimal cells from periosteum
- Matrix: DFDBA, FDBA, xenograft
- Signal

Principles for successful GBR

1. Infection free zone
2. Wound Stability
3. Space Maintenance
4. Blood Supply

Methods for ridge augmentation

- Autogenous grafts
 - Intra-oral
 - Extra-oral
- Allografts
 - Block
 - Particulate
- Bone substitutes
- Ridge expansion (ridge splitting, bone spreading, osteotome technique)
- Growth factors

Growth factors

- rhPDGFbb
- Platelet rich plasma (PRP) – 7 growth factors for hard and soft tissues
- rhBMP-2/ACS

Autogenous grafts are considered the ‘gold standard’

- Cells
- Matrix
- Signal – bone morphogenetic proteins (BMP)

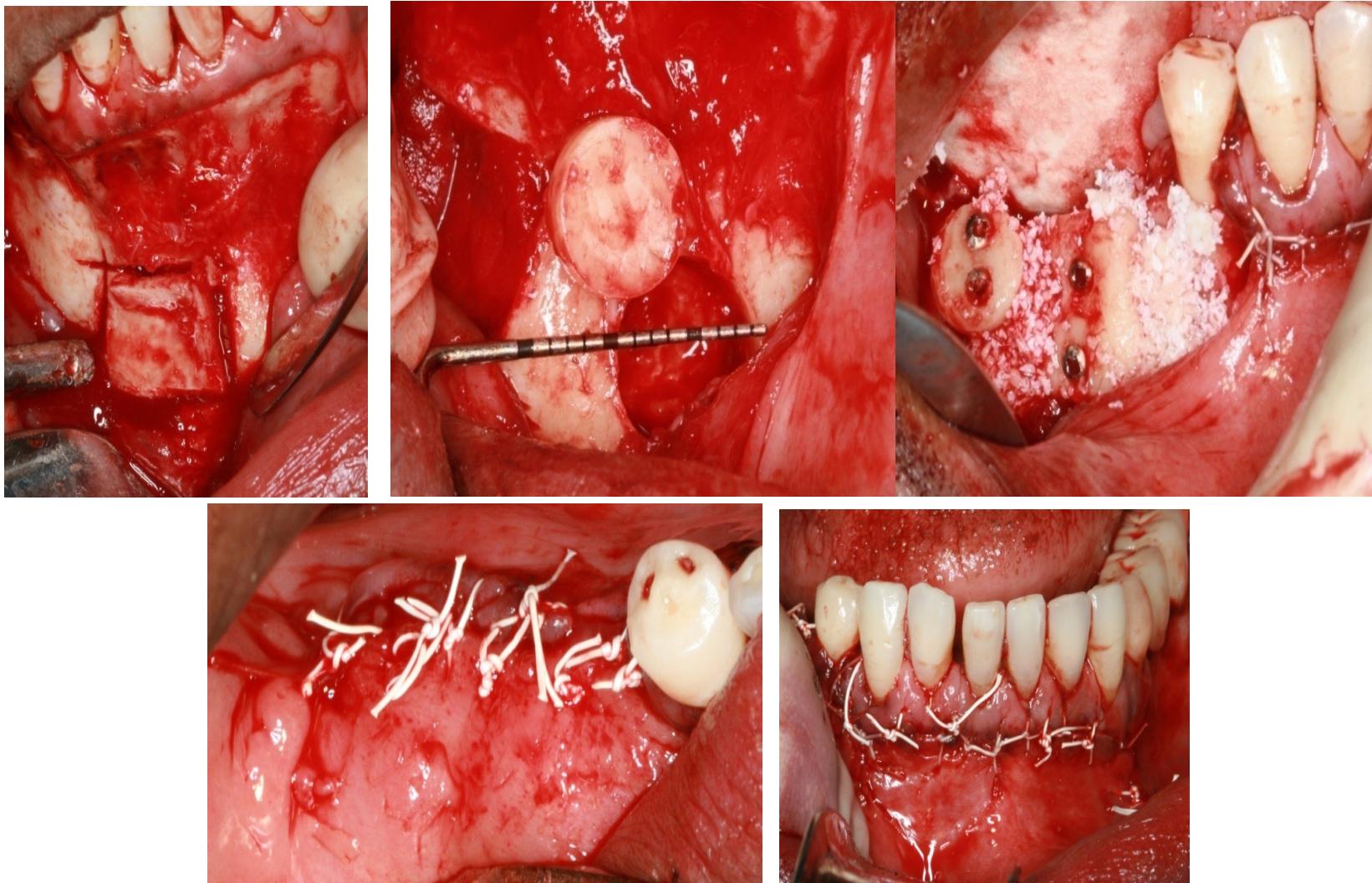
Symphysis Block Grafts

- Horizontal ridge augmentation 5-7 mm
- Vertical ridge augmentation up to 6 mm
- Donor site symphysis: 4-11 mm typical
 - 5 mm rule – 5 mm from apicies of incisors, 5 mm from mental foramina, and 5 mm from inferior border of mandible

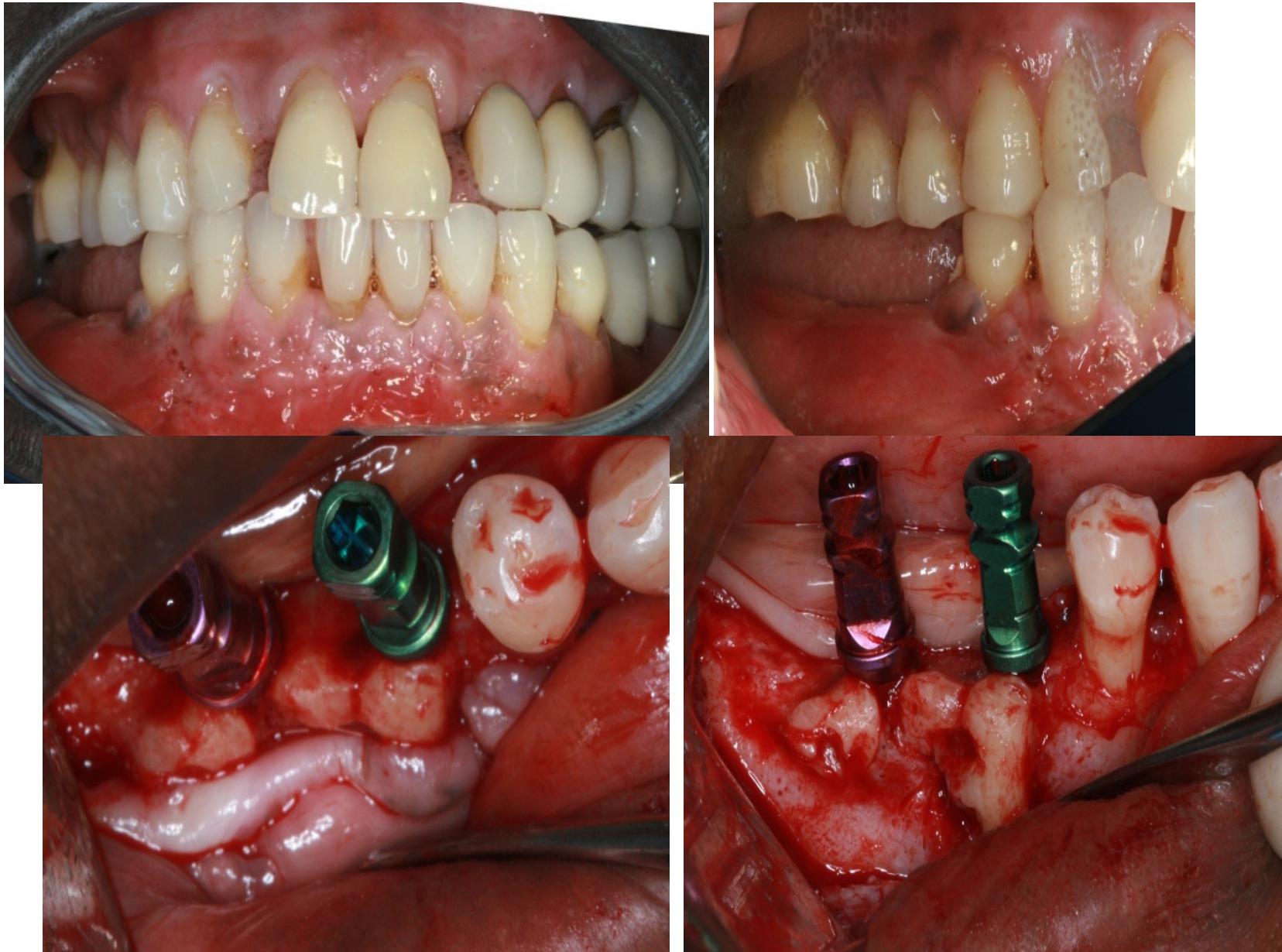
Autogenous Symphysis Graft



Autogenous symphysis Graft



Autogenous Symphysis Graft



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Surgeon: HS Sehgal, BDS, MS

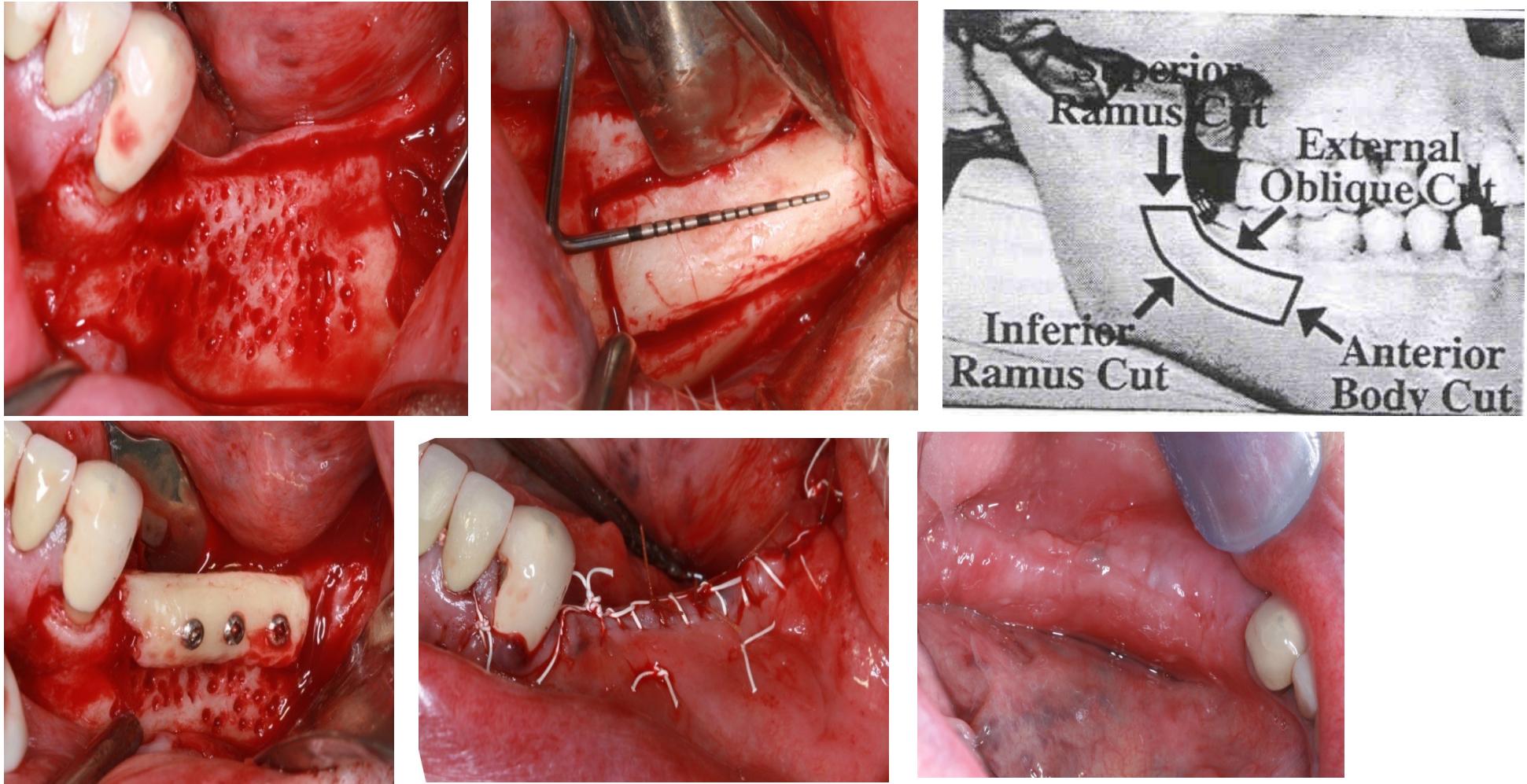
Ramus Buccal Shelf Block Grafts

- Horizontal ridge augmentation 3-4 mm
- Vertical ridge augmentation 3-4 mm
- Donor site ramus buccal shelf 3-4.5 mm

Autogenous Ramus Graft



Autogenous Ramus Graft



Mandibular Block Grafts

- Advantages
 - Office based
 - Conscious sedation
 - Moderate cost
 - Bone volume and density obtained
 - No membrane needed
 - Minimum morbidity
 - High long-term success rate

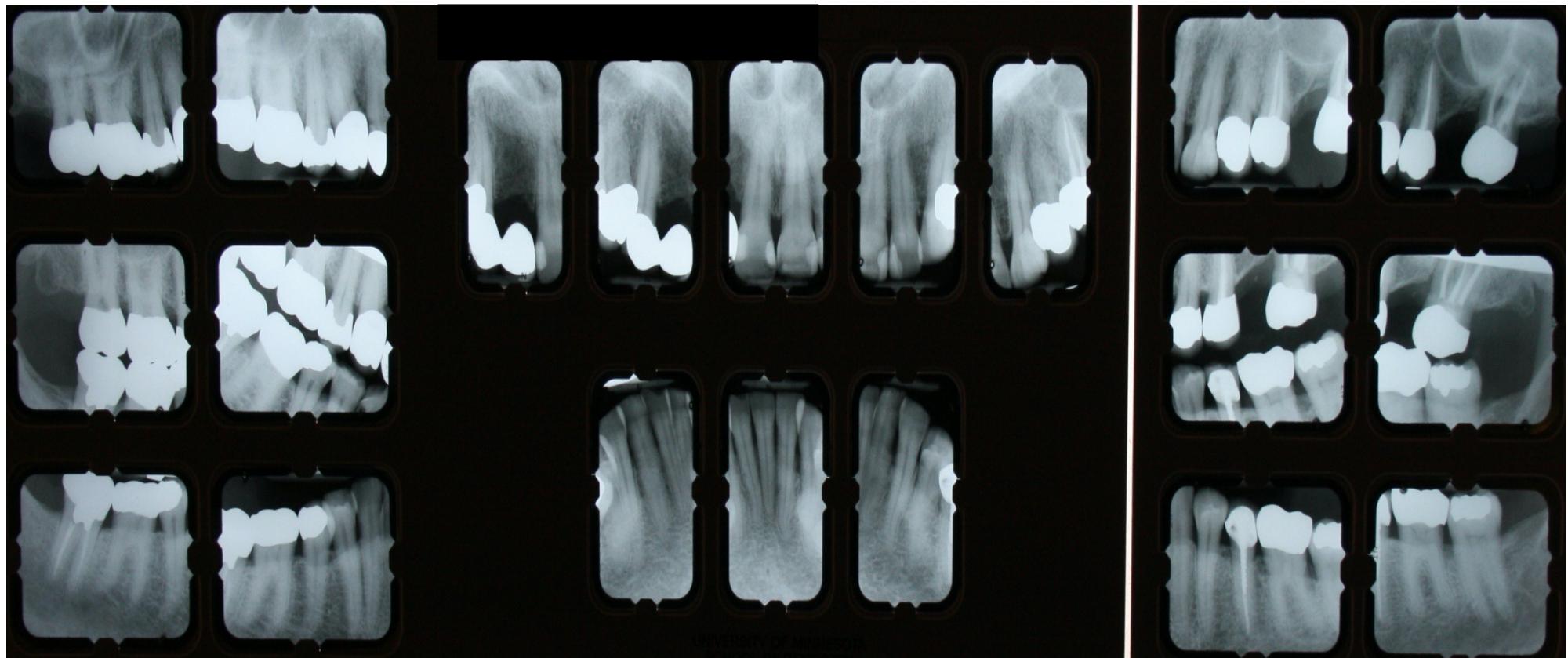
Mandibular Block Grafts

- Disadvantages
 - Limited bone volume
 - Potential for nerve injury
 - Learning curve – additional training

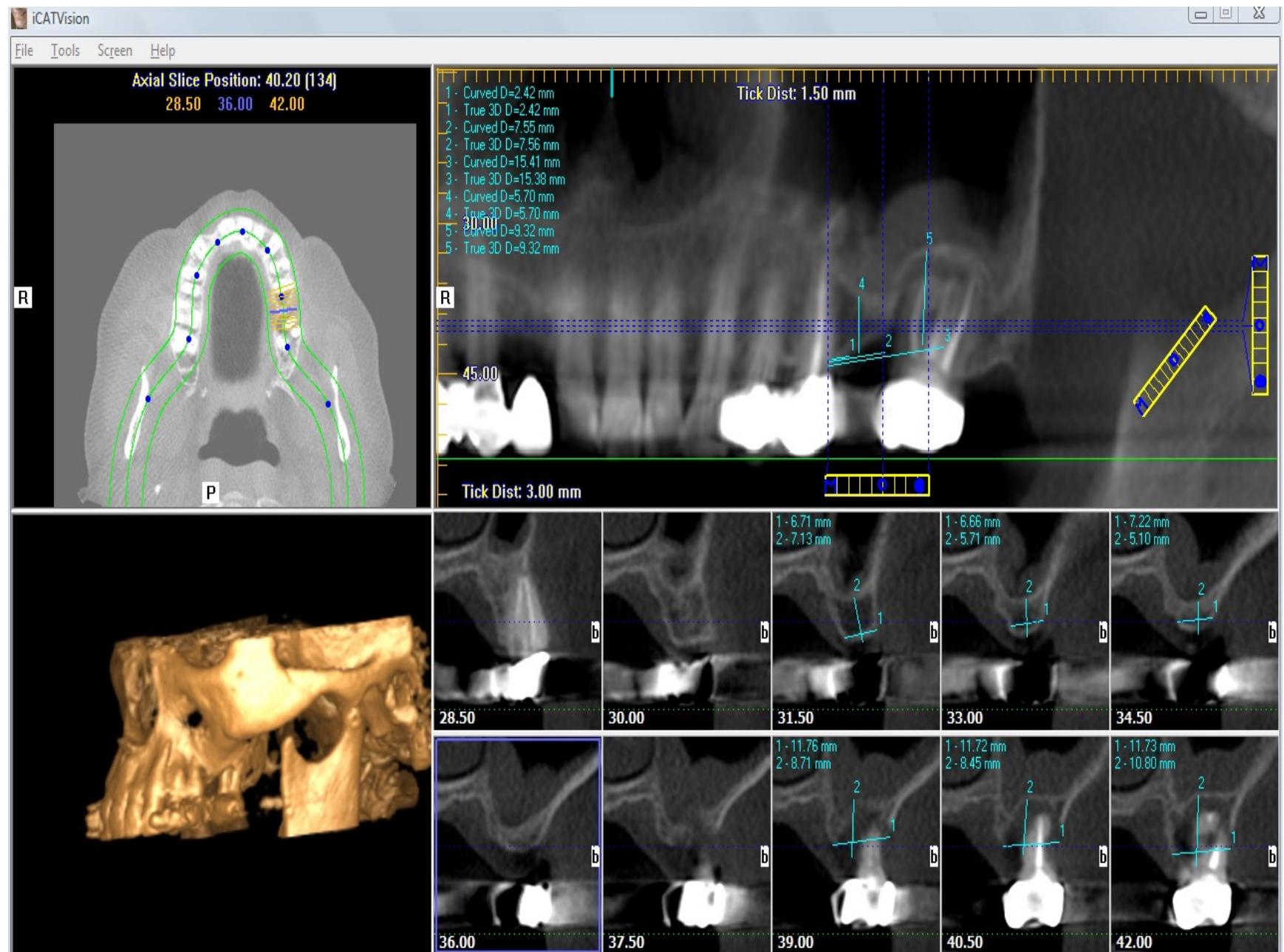
Particulate Grafts

- Particulate bone graft – DFDBA, FDBA, MinerOss™, Puros™
- Membrane – resorbable and non-resorbable, titanium reinforce, titanium mesh
- Membrane tacked?
- Ridge preparation?

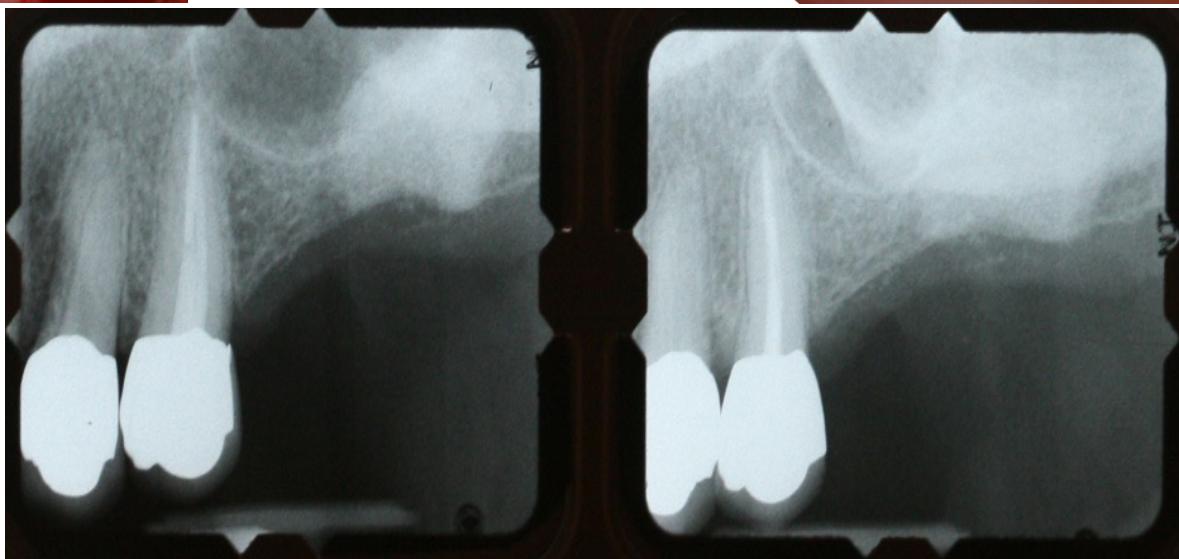
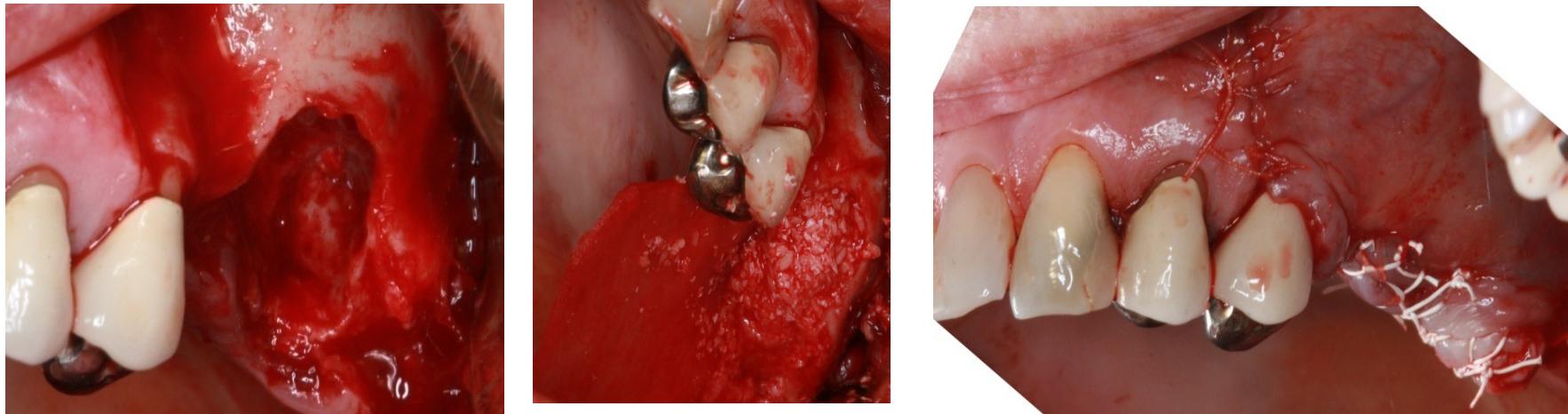
Particulate Bone Grafting



Particulate Bone Grafting

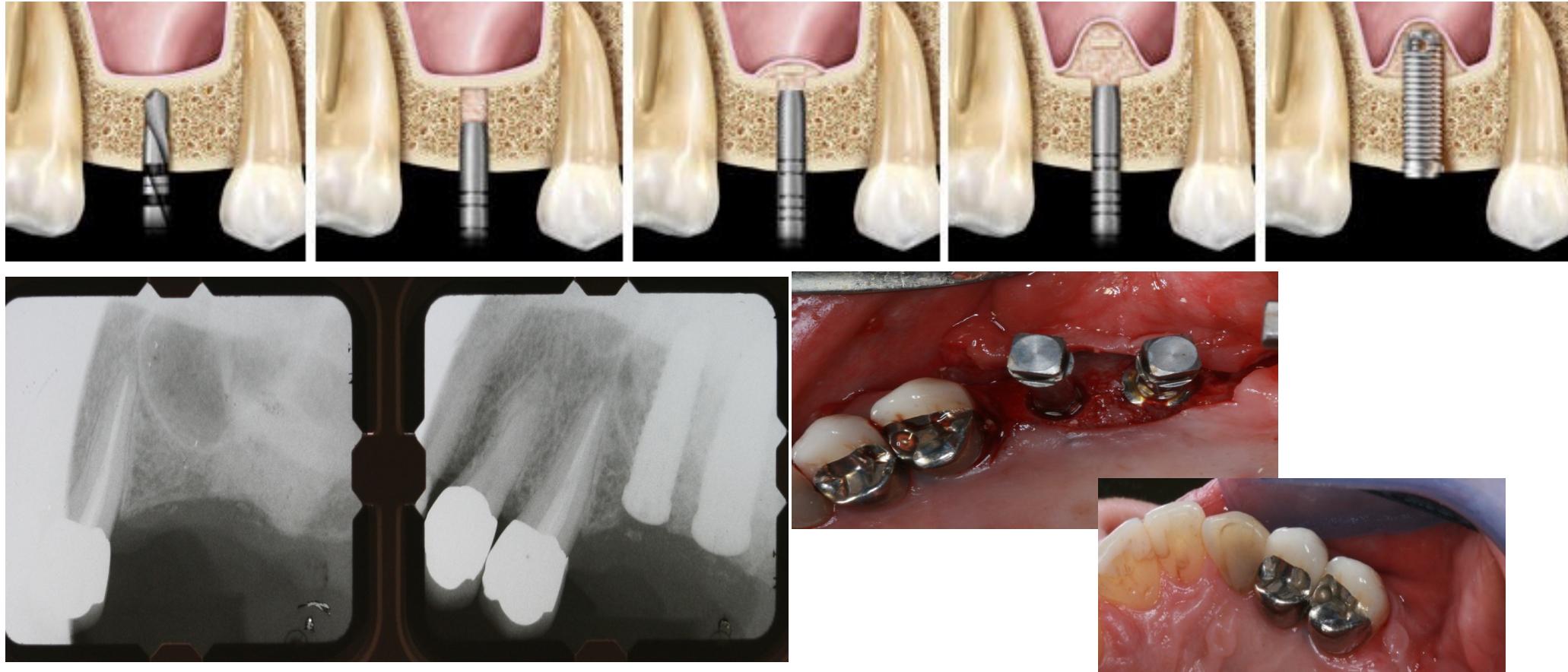


Particulate Bone Grafting



Indirect Sinus Augmentation & Implant Placement

<https://dentalartistry.co.nz/services/dental-implants/sinus-lifts/>



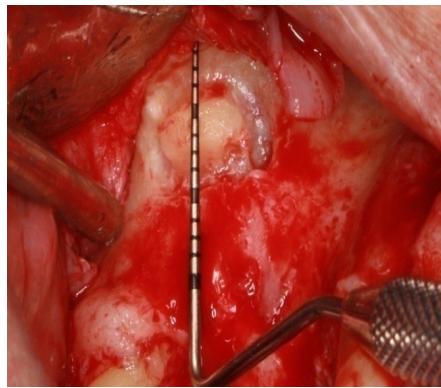
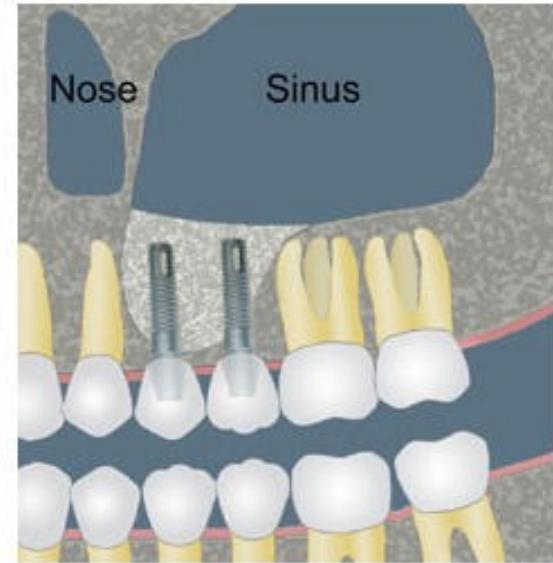
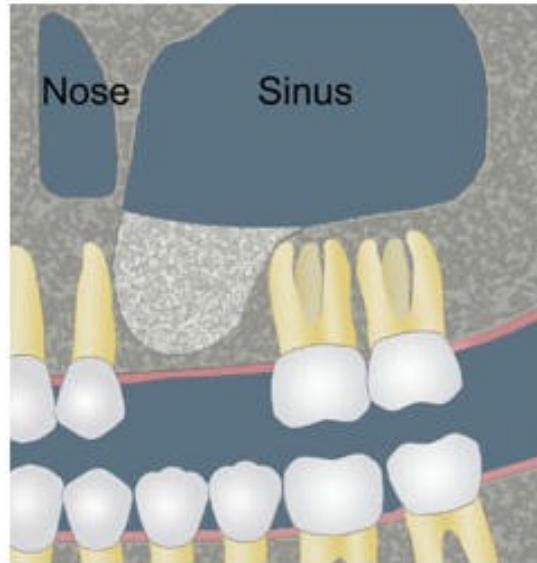
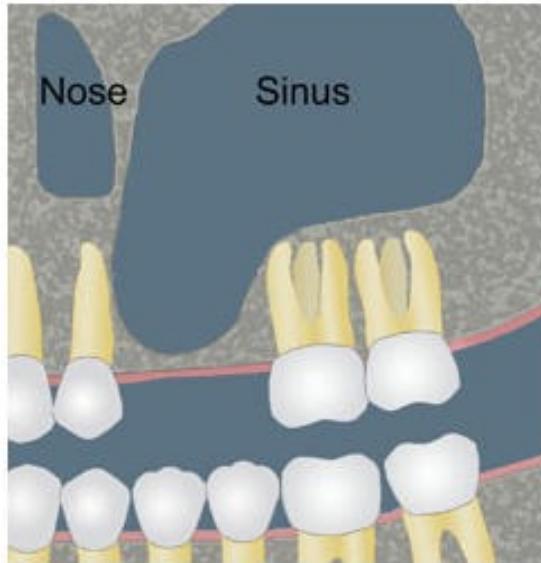
- Limited sinus augmentation required
- Existing moderate bone height e.g 7-9mm

Direct Sinus Augmentation & Implant Placement



Direct Sinus Augmentation & Implant Placement

<https://dentalartistry.co.nz/services/dental-implants/sinus-lifts/>



- Thank You!