Bisphosphonates and Treatment Planning: Bridge #22-27

Julie Bui, Prashant Charugundla, Hector Carmona, Christina Chen, Daniel Keyvani, Tracy Le, James Lelis

Patient Information:

- 74 y/o female
- CC at the first appt: “I broke my front tooth on the bottom.”
- CC at the second appt: “My root was extracted and I need to fill the space.”
- Medical History:
  - Osteoporosis
- Medications:
  - Calcium
  - Vitamin C
  - Vitamin D
  - Clinpro 5000
  - Prolia (denosumab) 60 mg/mL
    - Inject subcutaneously q6month; 3 yr history
- Dental History
  - 2/10 dental anxiety
  - Generalized Moderate Chronic Periodontitis

Denosumab (RANK-Ligand Inhibitor)

- RANK
  - Part of signaling pathway regulating osteoclast differentiation/activation.
- Reduces risk of vertebral, nonvertebral, and hip fractures in osteoporotic patients.
- Increases risk of developing osteonecrosis of the jaw.
  - 0.7-1.9% risk

Papapoulos S, Chapurlat R, Libanati C, et al: Five years of denosumab exposure in women with postmenopausal osteoporosis: results from the first two years of the FREEDOM extension. J Bone Miner Res 27:694, 2012.
Cummings SR, San Martin J, McClung MR, et al: Denosumab for prevention of fractures in postmenopausal women with osteoporosis. N Engl J Med 361:756, 2009.

MRONJ: Medication Related Osteonecrosis of the Jaw

1. Current or previous treatment with antiresorptive or antiangiogenic agents;
2. Exposed bone or bone that can be probed through an intraoral or extraoral fistula(e) in the maxillofacial region that has persisted for more than eight weeks; and
3. No history of radiation therapy to the jaws or obvious metastatic disease to the jaws.

Ruggiero SL, Dodson TB, Assael LA, et al: American Association of Oral and Maxillofacial Surgeons position paper on bisphosphonate-related osteonecrosis of the jaws--2009 update. J Oral Maxillofac Surg 67:2, 2009.

MRONJ: Medication Related Osteonecrosis of the Jaw

Proposed Etiological Hypotheses

1. Altered Bone Remodeling/Oversuppression of Bone Resorption
2. Angiogenesis Inhibition
3. Constant Microtrauma
4. Suppression of Innate or Acquired Immunity
5. Vitamin D Deficiency
6. Soft Tissue Bisphosphonate Toxicity
7. Inflammation
8. Infection

American Association of Oral and Maxillofacial Surgeons Position Paper on Medication-Related Osteonecrosis of the Jaw—2014 Update; Ruggiero, Salvatore L. et al.; Journal of Oral and Maxillofacial Surgery , Volume 72 , Issue 10 , 1938 - 1956

MRONJ: Medication Related Osteonecrosis of the Jaw

Local Risk Factors

1. Operative Treatment
   a. 52-61% of patients reporting tooth extraction as precipitating event.
2. More Common in Mandible
   a. 73% of cases
3. Concomitant Oral Disease
   a. Periodontitis/Periapical pathology
   b. 50% of cases
4. Demographic/Systemic Factors
   a. Age
   b. Sex (Female)
   c. Drugs: Corticosteroids, antiangiogenic agents, tobacco

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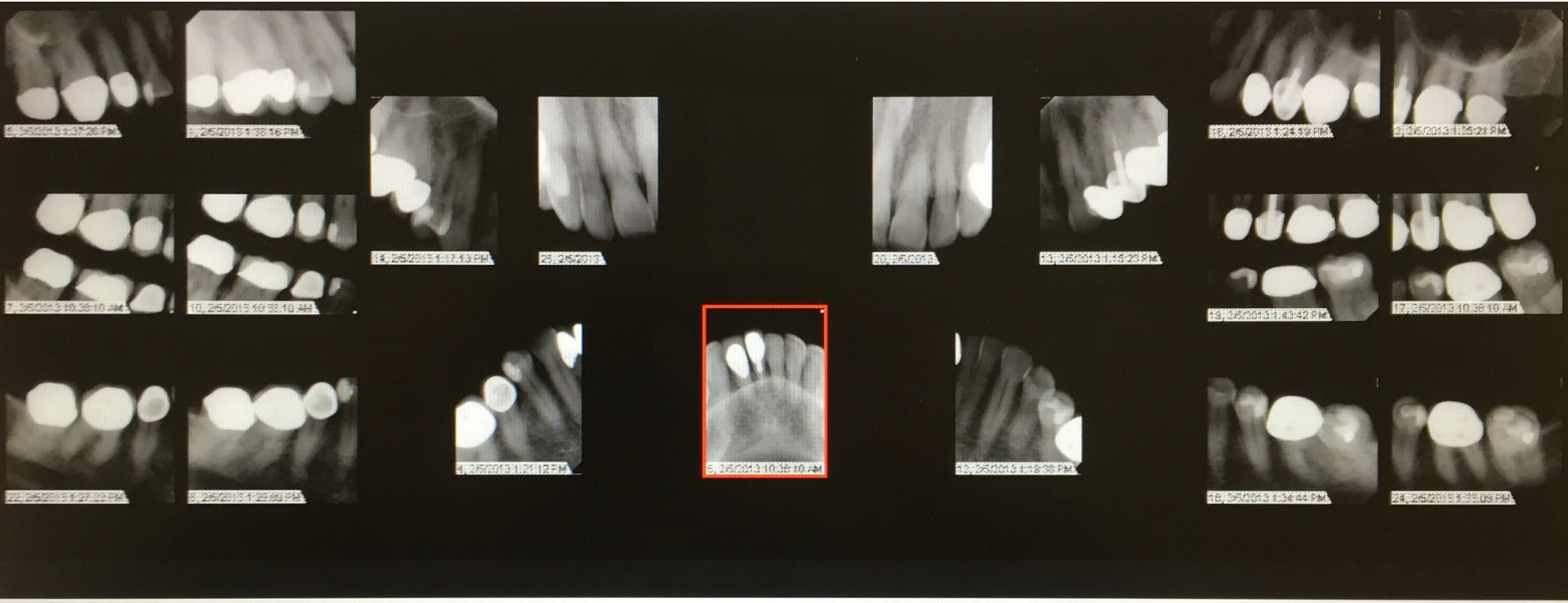
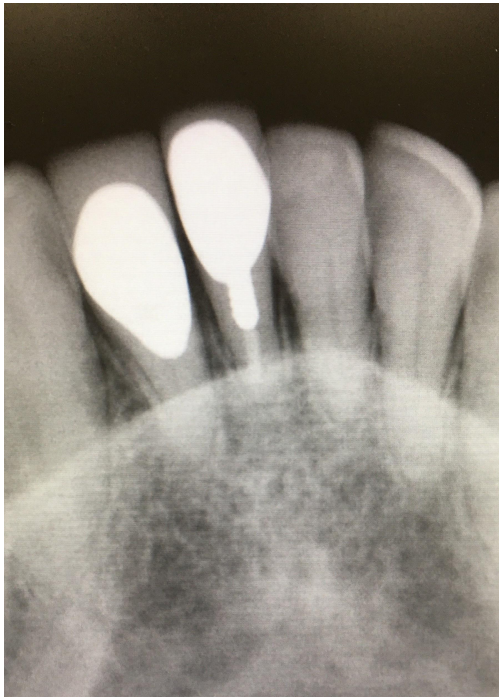
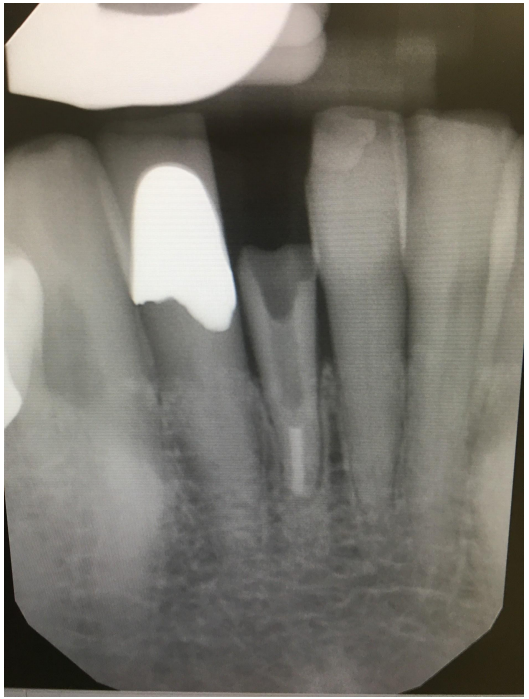
FMX:



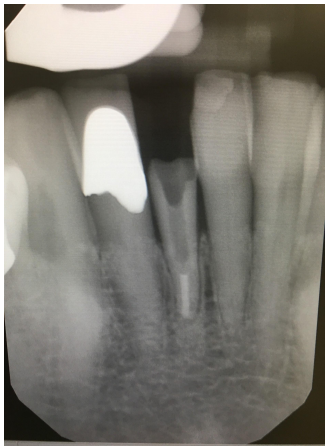
CC: Horizontal Fracture





First Appointment: History of Present Illness

- Pt reported no pain but sharp at fx point causing trauma to tongue.
- Previous RCT w/ post placement #25. Horizontal tooth fracture at the gumline. Post missing. Radiograph shows severe horizontal bone loss in the anterior mandible. #25 root has ⅔ structure removed for post placement. Apex gutta percha intact. No PARL. Widened PDL.



1. Treatment Considerations and Options:

- Due to Denosumab usage, faculty insisted on not extracting #25 root.
- Multiple tx plans proposed:
  - Amalgam plug and burying root. Subsequent bridge #22-27.
    - Benefits: Reduced risk of MRONJ
    - Risks: Always a risk of infection
  - Pros faculty recommended restoring tooth with retreat, cast post and core, and crown.
    - Benefits: Save natural tooth, maintain function
    - Risks [Cons]: Multiple appointments, costs, always a risk of fracturing crown
  - No treatment:
    - Benefits: No cost
    - Risks: Infection
- Patient decided to save the tooth and to retreat, cast post/core, and crown it. However after retreatment, the tooth had a vertical fracture and was extracted by an oral surgeon in private practice.

Second Appointment: History of Present of Illness

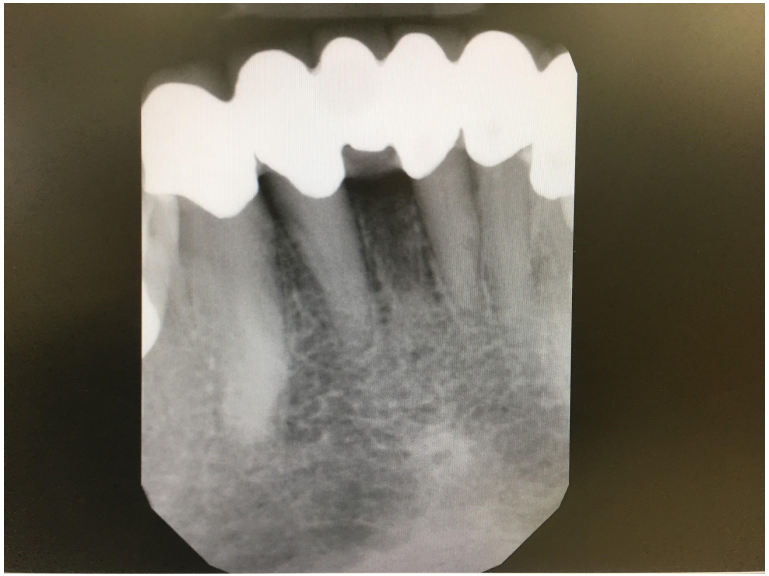
- Patient presents for evaluation of #25 extraction site.
- No pain. Trouble eating. Aesthetic concern.
- Based on examination:
    - Ext site #25 healing well. Multiple pocket depths >5mm in mandibular anterior region. Class 2 mobility noted in mandibular anterior.

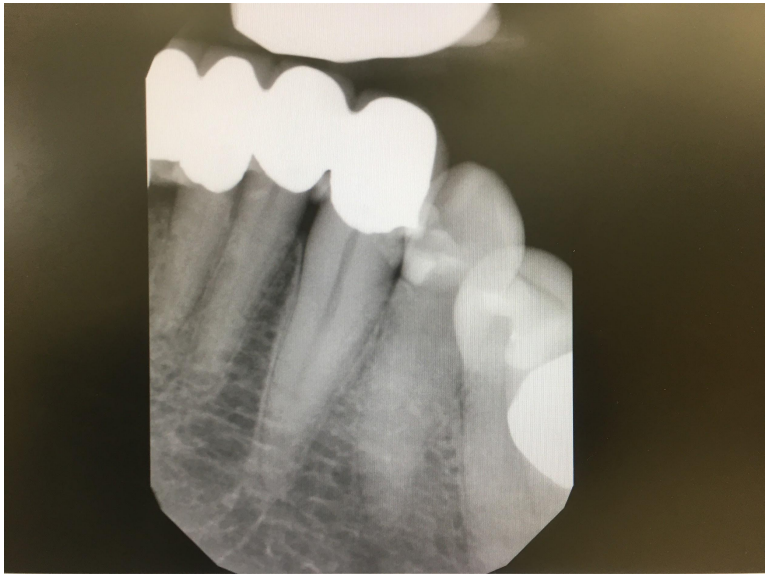
Treatment Considerations and Options:

- Due to perio compromised adjacent teeth, bridge [#24-#26] is not recommended.
- Due to Denosumab use, ext of #24-#26 is not recommended.
- Multiple treatment plans proposed:
  - Splint mobile mand. anteriors in bridge being supported by #22 and #27. Leading to a 5-abutment 1-pontic bridge.
    - Benefits: Reduce risk of MRONJ, stabilize mandibular anteriors, and aesthetic replacement #25.
    - Risks [Cons]: Difficulty maintaining adequate hygiene.
  - No treatment:
    - Benefits: No cost
    - Risks: Aesthetic concern
- Patient decided on splinting the lower mand. anterior and getting a bridge from #22-#27.

1. Case Presentation:

Delivery X-Rays





1. Case Presentation:

- Delivery photo
- Disclaimer: patient selected shade