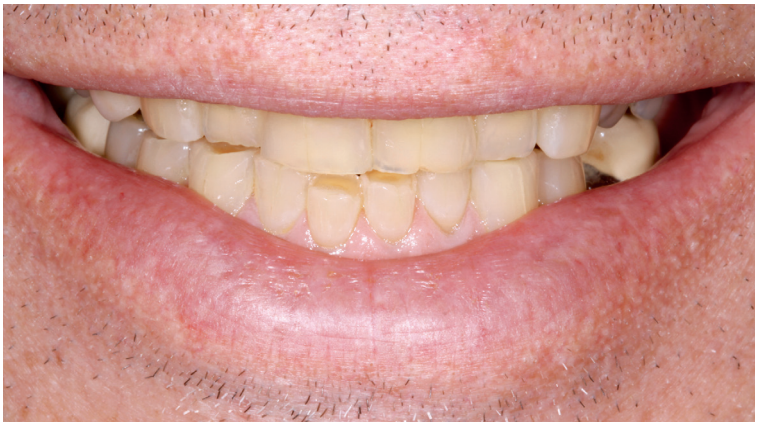
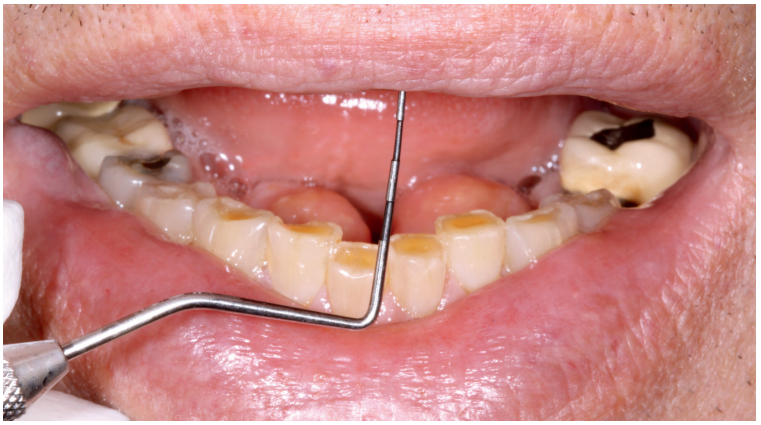
Clinical Treatment Planning • Case 73

Treating Clinicians: Drs. Brian Vence, David Forbes, George Mandelaris, Alan Rosenfeld and Tadanori Tanaguchi, MDT

Initial full-face view



Initial full smile



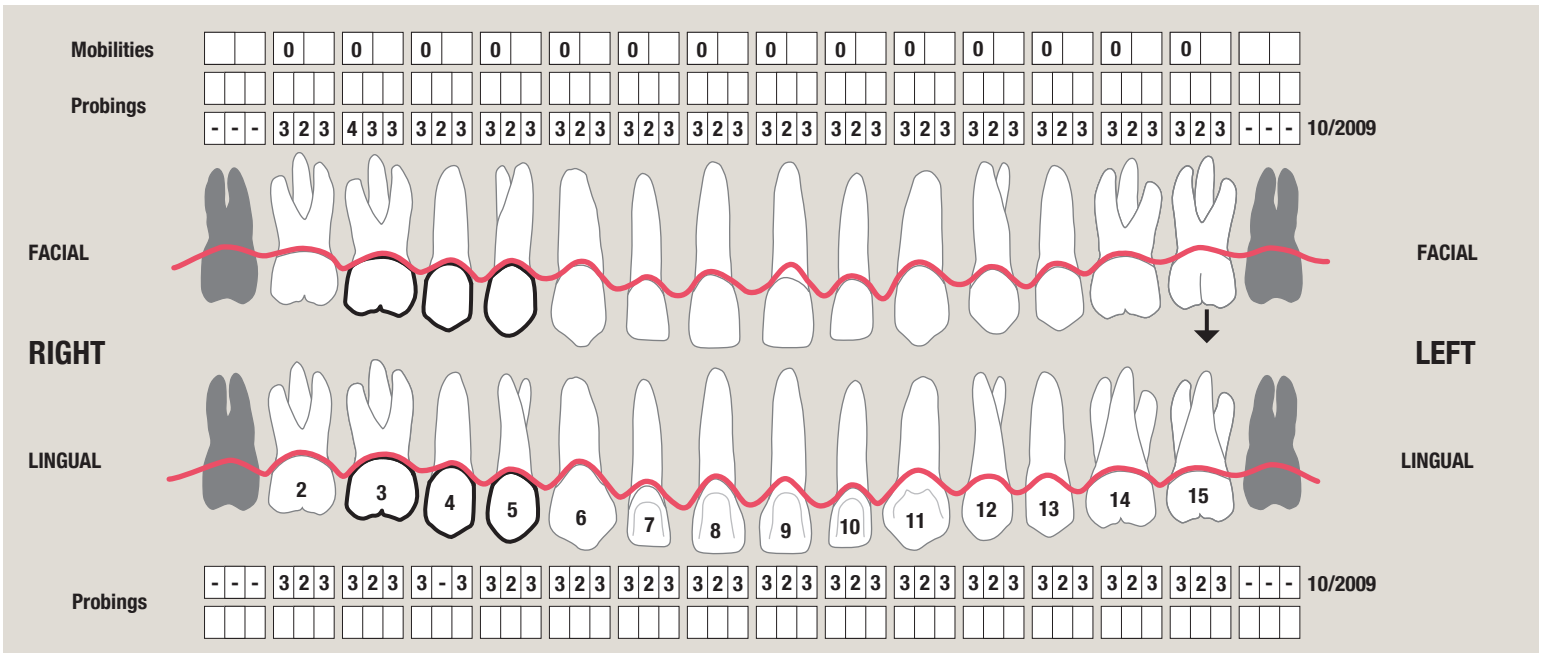
Initial close-up in repose

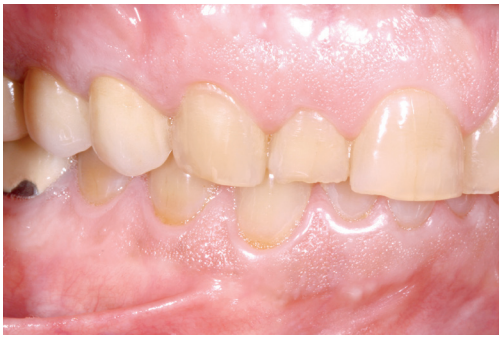
Age at Initial Presentation: 60
Initial Presentation: October 2009

Introduction and Background

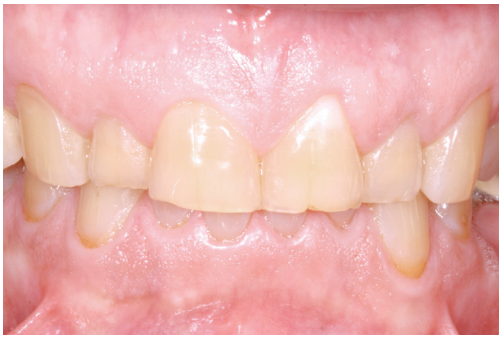
This 60-year-old Caucasian male had been under the care of his longstanding general dentist with regular dental visits annually. Tooth # 20 had recently been extracted after fracturing while eating a burger. He had previously lost tooth # 18. He reported a problem with a post and crown that didn't feel right, explaining that his previous dentist said the tooth was crumbling because it was brittle and decayed. He was previously informed that he grinds his teeth and was wearing a splint. The patient reported a history of muscle pain and cramping. Six months prior to the initial consultation he had been diagnosed by his medical doctor with sleep apnea and was using a CPAP machine, which he believed had alleviated his muscle pain. The patient was also aware that he may clench during the day. He was referred by his family dentist to the periodontist for implant placement in site #'s 18 & 20. The patient asked the periodontist for a referral for a second opinion.

There was nothing in the photos the patient wanted to change—he was happy with his situation and didn't want to look different. He was not thrilled with the color of his teeth and said he would consider bleaching. He mentioned he is the kind of guy that buys a good used car with maintenance package rather than purchasing a new car. In this reference, he questioned the need for a quintessential treatment plan or restorations. However, he said he

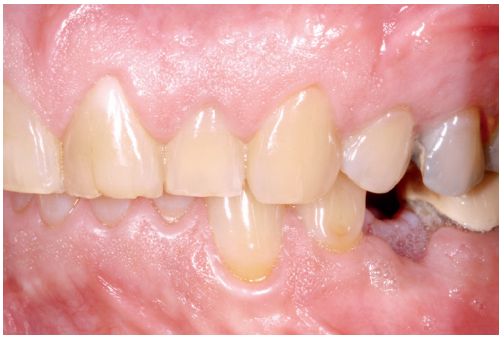




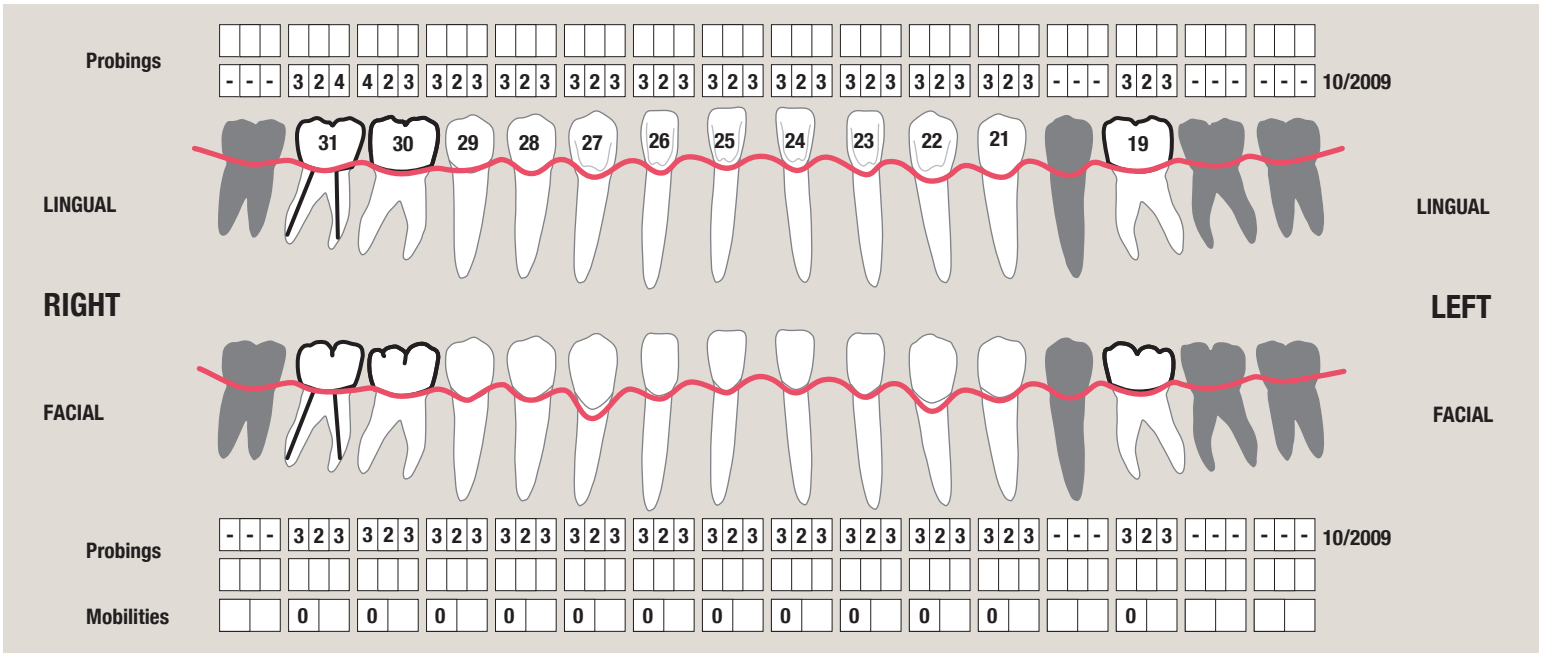
Initial right oblique view

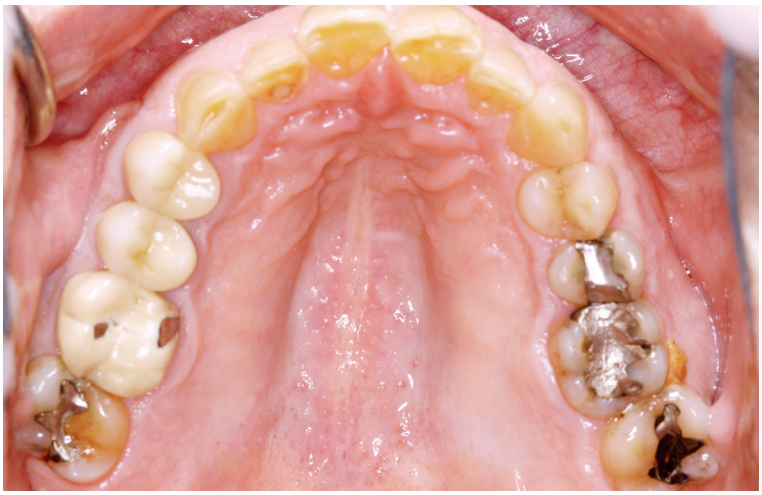


Initial view in maximum intercuspal position

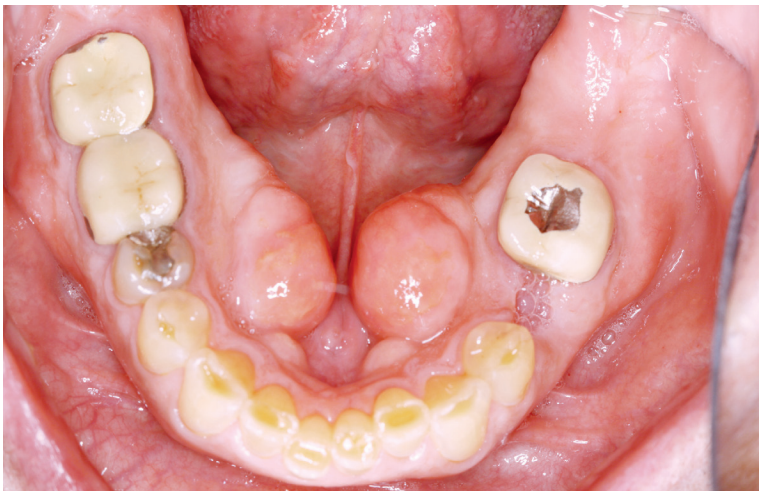


Initial left oblique view

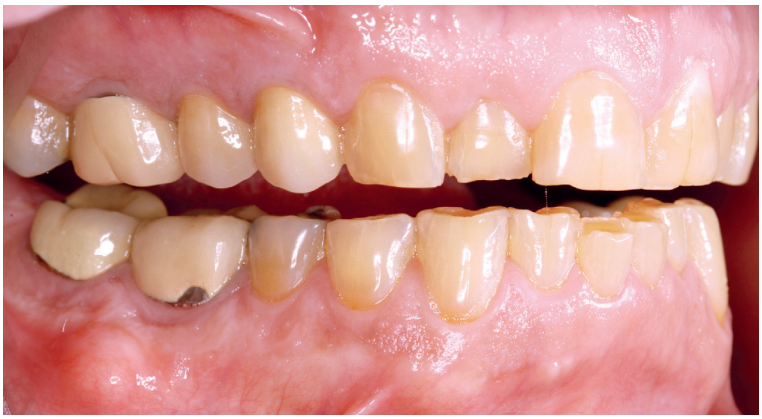




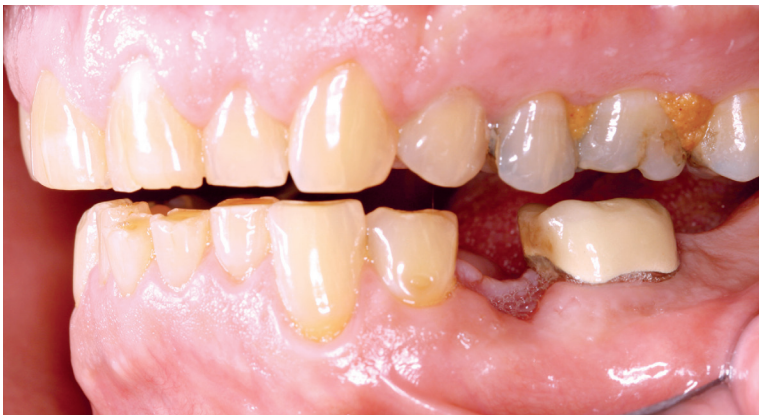
Maxillary occlusal view



Mandibular occlusal view



Right lateral view with teeth apart



Left lateral view with teeth apart

was open to exploring his options and he wanted to investigate what the treatment options would mean in terms of time, money and outcome.

Medical History

- ASA Class II with sleep apnea and hypertension.
- Using Astelin Nasal Spray® for seasonal allergies.
- No past surgical history.
- No known allergies.
- Past medical history significant for obstructed sleep apnea and hypertension.
- Sleep apnea with BP 145/82 and HR 78.
- Last physical completed within the year.

Diagnostic Findings

Extraoral/Facial:

- Normal facial asymmetry to left and midline to left.
- Mesocephalic facial profile and a minimal OVD decrease.
- Low lip mobility of 6 mm and longer lip length of 24 mm.
- Mid-face 69 mm, lower face 79 mm.
- Inadequate tooth display in active smile.
- Less than 1 mm of tooth display with lips at rest.

TMJ/Mandibular Range of Motion, Muscles of Mastication, and Facial Expression:

- History of headaches until April 2009 with use of a CPAP.
- History of clicking/popping in joints has stopped.
- Pain on palpation only of lateral pterygoids of six on a visual analog scale.
- Range of motion within normal limits.
- Pain with lateral movement to the right, slight pain with movement to the left and none on opening.
- No pain during load test.
- The first point of contact in centric relation was on teeth #'s 14 & 19. The magnitude of the difference between first point of contact and maximum intercuspal position was 1 mm anterior and 1 mm vertical.
- Piper Classification of Stage IIIa on the right and IVa on the left.

Intraoral Exam:
Soft Tissue/Periodontal:

- Oral mucosa within normal limits with a fibroma on the right lower lip.
- Adequate attached gingiva.
- Apparent thick phenotype.
- Minor gingival asymmetry, more apparent in the mandibular incisors.
- Generalized bleeding on probing of all four posterior quadrants.
- Isolated probing depths of 4-5 mm on teeth #'s 3, 30 & 31.
- No tooth mobility.
- Large mandibular exostosis.

Dentition:

- Missing teeth #'s 1, 16, 17, 18, 20 & 32.
- Existing porcelain-fused-to-metal crowns on teeth #'s 3, 4, 5, 19, 30 & 31.
- Amalgam restorations on teeth #'s 2, 14, 15 & 29.
- Class V composite restoration on tooth # 9.
- Teeth #'s 13, 14 & 29 are compromised due to defective margins and recurrent caries.
- Cusp fracture on tooth # 29.
- Extensive attrition and erosion on teeth #'s 2, 6-15 & 21-28.
- Anterior crowding.
- Non-aesthetic proportions to all anterior tooth groups—premolars, canines, laterals and centrals.
- Tooth color is Vita shade A4.

Biological:

- Teeth #'s 18 & 20 were recently fractured and extracted.
- Previous root canal therapy on tooth # 31.

Occlusal Notes

- Extensive erosion and wear with compensatory super-eruption.
- Lack of anterior protected guidance.
- Angle Class I, but masked Class II from possible loss of vertical dimension due to a loss of tooth structure.

Radiographic Review

- Generalized normal bone levels.
- Cephalometric-mesocephalic skeletal relationship.
- CBCT shows normal condylar dimensions.
- MRI displays reduced joint space—right lateral and left medial pole displacement with reduction.

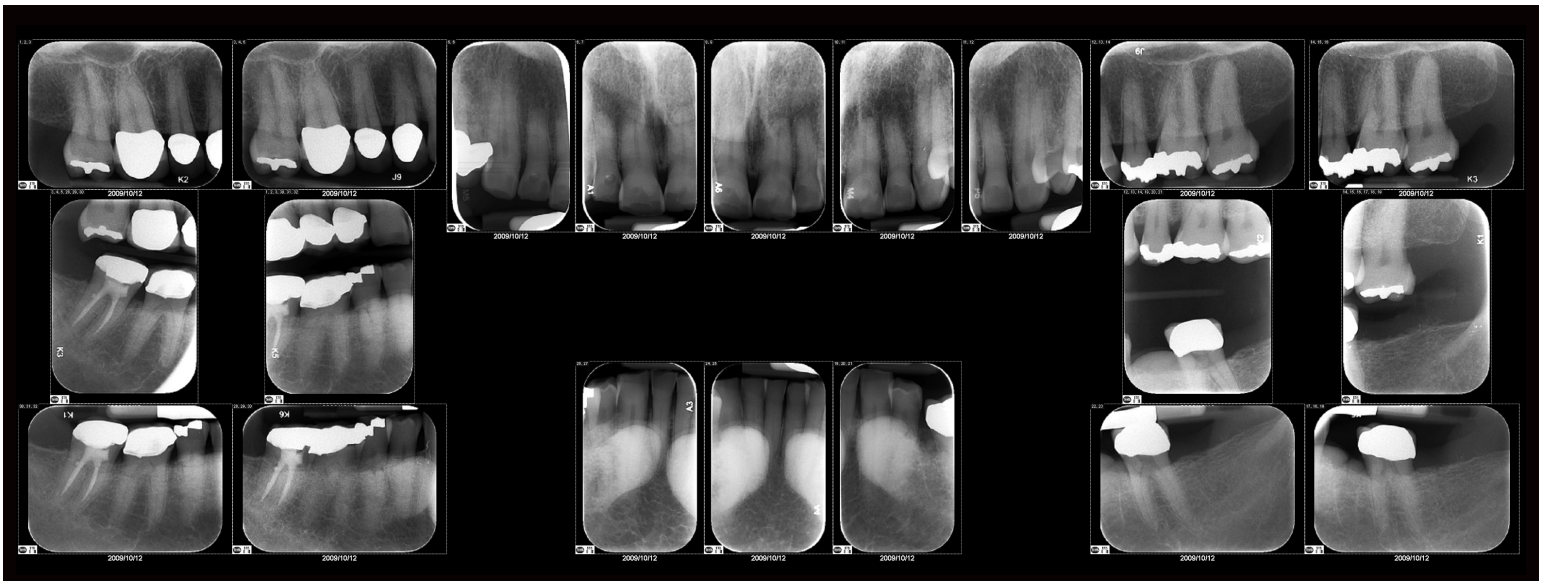
Diagnosis and Prognosis

Diagnosis:

- AAP I.
- Partial edentulism.
- Space appropriation issues for restorative treatment and implant placement secondary to erosion and attrition with compensatory eruption and migration.
- Masked Class II malocclusion due to attrition and erosion.
- Wear, unfavorable force distribution and uncoordinated chewing cycles.
- Poor structural integrity of teeth secondary to wear and/or non-serviceable amalgam restorations.
- Sleep apnea, sleep bruxism and sleep related GERD.
- Piper Classification of Stage IIIa on the right TMJ with the medial pole structurally intact and lateral pole structurally altered with reduction.
- Piper Classification of Stage IVa on the left TMJ with a structurally altered lateral pole and a structurally altered medial pole with reduction.

Prognosis:

- Periodontal: Good
- Biomechanical: Questionable without treatment.
- Functional: Poor without treatment.
- Aesthetics: Poor without treatment.



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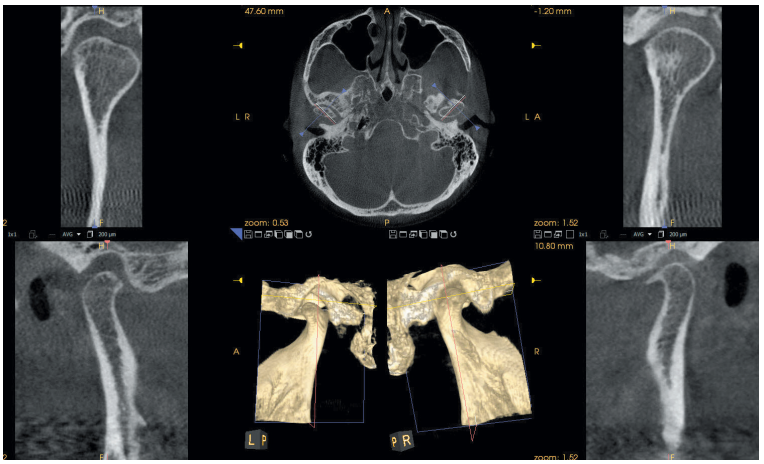
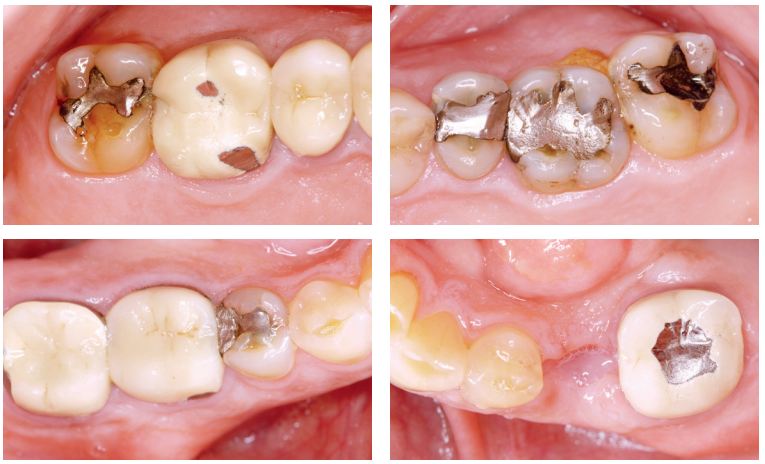


Cone beam CT of TMJs



Top: close-ups of right and left maxillary occlusal view
Bottom: close-ups of right and left mandibular occlusal view

Summary of Concerns

- How do we satisfy the patient's desire for minimal treatment with the recent history of tooth loss due to fracture?
- What led to the extensive loss of tooth structure from erosion and attrition over the years?
- Is there adequate space appropriation for restorations and implants with the existing occlusal scheme?
- Can we stabilize the dentition without significantly altering the occlusion?
- Can we stabilize the dentition by significantly altering the occlusion?
- The patient does not perceive any aesthetic issues except tooth color.
- How may we discover the answers to the above questions with the patient?

Stop! Time to Outline Goals/Objectives of Treatment and Treatment Plan

Proposed Treatment Plan • Case 73

Phase I: Force Management & Co-Discovery

1. Fabricate maxillary stabilization splint.
2. Perform equilibration in fully-seated condyles.
3. Deliver incisal composites to seal dentin, reinforce enamel and provide minimal anterior protected occlusion.
4. Re-evaluate patient.

Phase II: Interim Treatment

5. Review treatment progress with interdisciplinary team, patient and patient's spouse.
6. Control caries and temporarily cement the crowns on teeth #'s 4 & 5.
7. Extract teeth #'s 5, 12 & 30.
8. Re-evaluate patient.

Phase III: Periodontal Surgery

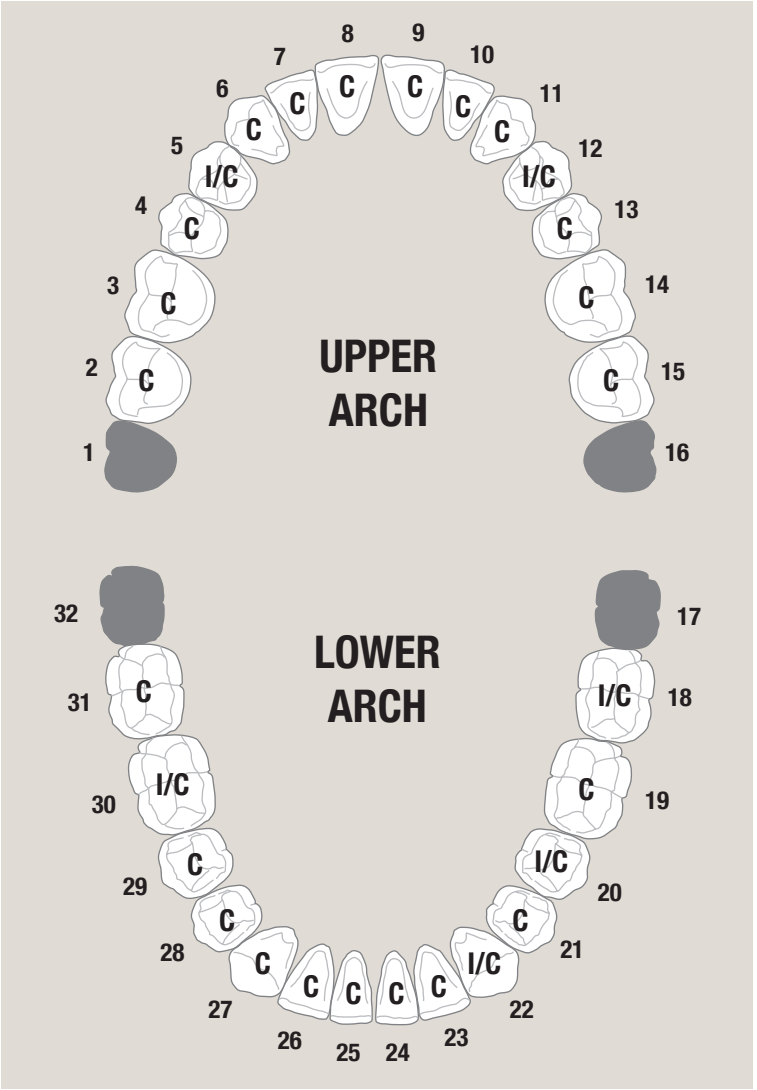
9. Fabricate diagnostic wax-up after digital smile design.
10. Fabricate preparation guides and provisional shells from wax–up for posterior teeth.
11. Remove mandibular exostoses.
12. Deliver posterior provisional restorations based on diagnostic wax-up.
13. Complete crown lengthening and root reshaping surgery.
14. Place implants in site #'s 5, 12, 18, 20 & 30.
15. Complete transitional bonding to prepare for orthodontic treatment on teeth #'s 6-11.

Phase IV: Surgically Facilitative Orthodontic Therapy (SFOT)

16. Complete corticotomy to alter dentoalveolar bone for ideal tooth root position to gain space for natural tooth morphology.
17. Modify transitional bonding once space is over-corrected to alter tooth contours on teeth #'s 6-11 & 22-27.
18. Finalize orthodontics for ideal aesthetics and function.

Phase V: Definitive Restorative Treatment

19. Fabricate diagnostic casts and wax-up.
20. Refine tooth preparations and fabricate diagnostic provisional restorations.
21. Refine occlusion to coordinate neuromuscular, dental and parafunctional envelopes of function with soft tissue grooming and trial therapy.



FPD=fixed partial denture I/C=implant supported crown C=Crown P=pontic R=retainer V=veneer

22. Deliver final restorations.
23. Place patient on a six-month recall program.

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