



The Team Approach: Simplifying Complex Care

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ABSTRACT In today's oral and maxillofacial surgery practice, the interaction between the oral and maxillofacial surgeon, the restorative dentist, and the rest of the dental and medical community is the foundation of daily patient care and management. The combination of the talents from each medical and dental discipline results in the highest quality of patient care. The following will illustrate the power of the comprehensive team approach.

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Oral and maxillofacial surgery has always been an exciting, discipline and specialty of dentistry. The scope of treatment and expertise of the specialty continues to evolve and improve. Today's materials and techniques allow us to routinely provide care on a daily basis that could only be dreamed about in the past. This high level of care continues to advance as we push toward the future.

The interaction between the oral and maxillofacial surgeon, the restorative dentist, and the rest of the dental and medical community is the foundation of today's daily patient care and management. Dentists must strive to improve this interaction as the outcome of treatment is based on how well we all work and communicate with each other. Combining the talents of more than one medical and dental discipline is indicated and necessary in a large number of patient treatment plans and re-

sults in the highest quality of patient care.

The best diagnosis and treatment for the patient occurs when dentists are aware of the services each discipline is capable of providing and their own limitations. This article will illustrate treatment planning and care highlighting a few of today's common oral and maxillofacial surgery services as examples.

Dentoalveolar procedures including extractions and alveolectomy, excision of pathologic lesions, treatment of trauma, and reconstruction have historically been the foundation of an oral and maxillofacial surgeon's daily patient care. The specialty's unique training also provides oral surgeons with the ability to safely administer outpatient general anesthesia and IV sedation, along with local anesthesia, and makes it possible to provide daily office procedures virtually pain-free.

The introduction of osseointegration, the first highly predictable long-term

dental implant technique, to the United States in the early 1980s had a very positive effect on the authors' daily oral and maxillofacial surgery practices as it has on all of dentistry by greatly improving the level of care and its benefits to patients' lives.¹ The authors, as do many oral and maxillofacial surgery practices, now provide bone preservation procedures at the time of extractions, alveolar bone grafting, sinus floor bone grafting, and soft tissue procedures in their offices or hospital and/or outpatient surgery centers when necessary to make the placement of dental implants possible and predictable for oral and maxillofacial reconstruction.

Since the profession's diagnosis, treatment planning, and surgical procedures are now geared toward the ultimate placement of dental implants for long-term definitive treatment, it means treatment planning and communication between the providers of patient care is of the utmost importance from the outset.

The treatment process generally begins in the restorative dentist's office where the patient presents with one or more specific or general concerns. This most often makes the restorative dentist the first contact point for the patient's treatment and the gateway to the other members of the treatment team. After listening and noting the patients concerns, the restorative dentist performs a thorough examination of the patient and derives a problem list. The clinical examination includes the dentition, periodontium, skeletal and bite relationships, along with a general facial and esthetic evaluation²⁻⁴ (TABLE 1).

A radiographic examination is also indicated and should include, at the minimum, oral X-rays by the restorative dentist. Often a panoramic radiograph is indicated, and, depend-

ing on the list of patient concerns and problems, cephalometric radiographs and/or CT scans are necessary.

Diagnostic casts are very helpful. Photographs are also helpful for information sharing between providers and are an excellent way to document pretreatment conditions. They are also helpful for patient presentation and education. The appropriate member of the treatment team orders the proper radiographic and other indicated studies. Their findings are then shared with the other team members to plan definitive treatment.

The following patient treatment case illustrates the interaction between members of the treatment team and show some of the ways the oral and maxillofacial surgeon can provide support for comprehensive patient treatment and add to the scope of care provided to patients in the restorative dental office (FIGURES 1A-C AND 2A-B).

This 26-year-old male presented for treatment to the restorative dentist's office with complaints of not liking the esthetics of his anterior bridgework, his inability to occlude his teeth together, poor speech, difficulty eating, and muscle pain with function. He was highly conscious of his problem and felt it was a major issue in his personal and professional life. He also was a very apprehensive patient who had difficulty sitting through routine dental procedures.

Problem list

- Maxillary posterior vertical hyperplasia (FIGURES 1A-C AND 2A-B)
- Apertognathia (FIGURES 1A-C AND 2A-B)
- Lip incompetence (FIGURES 1A-B AND 2B)
- Mentalis habit (FIGURE 1B)
- Tongue thrust habit (FIGURE 1A)
- Partial edentulism anterior maxilla and mandible (FIGURES 1B-C AND 2A-B)
- Alveolar vertical and horizontal

TABLE 1

Examination Checklist

Dentition

- Caries
- Crowding
- Alignment
- Unerupted and impacted teeth
- Retained deciduous teeth
- Edentulous areas
- Bite relationships
- Occlusal planes
- Esthetics

Periodontium

- Bone levels
- Soft tissue-health attached muscle attachments
- Esthetics

Skeletal

- Maxillary horizontal anterior-posterior excess and deficiency
- Maxillary vertical excess and deficiency
- Maxillary lateral width excess and deficiency
- Apertognathia (open bite)
- Mandibular anterior-posterior excess and deficiency
- Mandibular pogonion and menton vertical and horizontal excess and deficiency
- Asymmetry
- Esthetics

Facial Esthetics: Bone and Soft Tissue

- Lips — length-symmetry-fullness
- Nose
- Eyes
- Ears
- Cheeks
- Skin
- Neckline



FIGURE 1A. Photo illustrates lip incompetence, apertognathia, and poor tongue position. It also shows that the display of the maxillary central and lateral incisal edges below the upper lip at rest are within normal limits (2 mm).



FIGURE 1B. Pretreatment lateral cephalometric X-ray shows maxillary posterior vertical hyperplasia, apertognathia, lip incompetence, mentalis habit, and alveolar horizontal width deficiency in the maxillary and mandibular anterior.



FIGURE 1C. Pretreatment panoramic radiograph indicates partial edentulism in the anterior maxilla and mandible, apertognathia, and the general condition of the teeth and associated structures.

deficiency anterior maxilla and mandible (FIGURES 1B, 5, 9, AND 10)

History

- Previous orthodontic treatment for approximately three years. Completed at age 13
- Attacked at age 16, resulting in loss of maxillary and mandibular anterior teeth, and alveolar bone loss
- Removable prosthesis worn until fixed partial dentures were placed in the anterior maxilla and mandible at age 19
- Development of a significant anterior open bite during completion of growth

Treatment Sequence

- Restorative dentist exam and referral to oral and maxillofacial surgeon, orthodontist, and periodontist
- Examinations by oral and maxillofacial surgeon, orthodontist, and periodontist
- Communication between all team members
- Development of a comprehensive treatment plan
- Presentation of the treatment plan to the patient with costs
- Acceptance of treatment plan by patient
- Treatment

Treatment

1. Assessment of dentition and occlusion by restorative dentist with decision among team members to use



FIGURE 2A. Pretreatment photo indicates the general condition of the existing dentition, soft tissues, and occlusion.



FIGURE 2B. Preoperative lateral cephalometric radiograph taken after initial orthodontic treatment. Used to plan orthognathic surgery procedures.



FIGURE 3A. Postorthognathic surgery photo of dentition and occlusion showing correction of apertognathia.

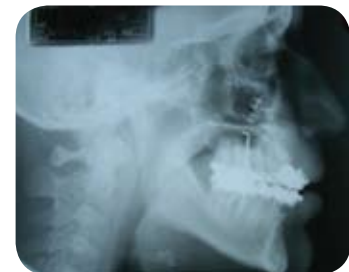


FIGURE 3B. Postorthognathic surgery lateral cephalometric X-ray. Shows correction of maxillary posterior vertical hyperplasia, apertognathia, lip incompetence, and mentalis habit. Notice plate and screw fixation in superior maxilla used for the procedure.

existing anterior maxillary and mandibular fixed partial denture restorations until after orthodontics and orthognathic surgery (FIGURES 1A-C AND 2A)

2. Periodontal evaluation to determine bone and soft tissue health around the teeth for orthodontics, orthognathic surgery, and later bone graft and implant reconstruction

3. Orthodontic treatment to setup maxillary and mandibular dentition for orthognathic surgery-periodontal maintenance (FIGURE 2B)

4. Orthognathic surgery by oral and maxillofacial surgeon⁵

Le Fort 1 maxillary osteotomy to intrude posterior maxilla and close anterior open bite (FIGURES 3A-B AND 4A)



FIGURE 4A. Photograph of anterior occlusal relationship just prior to removal of orthodontic appliances following orthognathic surgery and postsurgical orthodontics. Notice the normal vertical overlap (overbite) and horizontal overlap (overjet).



FIGURE 4B. Panoramic radiograph made prior to bone grafting. Notice the original maxillary and mandibular fixed partial dentures have been replaced with new provisional restorations to facilitate prosthetic management through the grafting and implant treatment phases.



FIGURE 5. Photograph during bone graft surgery showing the vertical and horizontal deficiency of the anterior maxilla in relation to ideal tooth position indicated with the prefabricated maxillary surgical guide indexed on the posterior maxillary teeth.



FIGURE 6. Photograph during surgery of the cortico-cancellous blocks harvested from the iliac crest fixed into position to reconstruct the anterior maxillary alveolar deficiency. Cortico-cancellous particulate bone from the ilium was packed around the blocks to address the vertical component of the deficiency. The bone graft was covered with a pericardium membrane before tension-free closure of the soft tissue was accomplished.^{9,10}



FIGURE 7. Photograph taken immediately after bone graft surgery with surgical guide in place for reference. Anterior-posterior view to confirm vertical and horizontal correction in area.

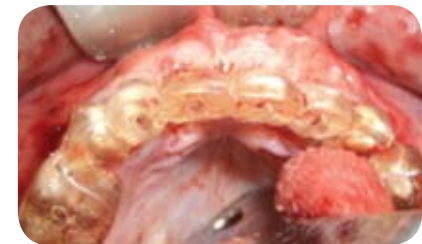


FIGURE 8. Photograph taken immediately after bone graft surgery with surgical guide in place for reference. Occlusal view to confirm vertical and horizontal correction in area.

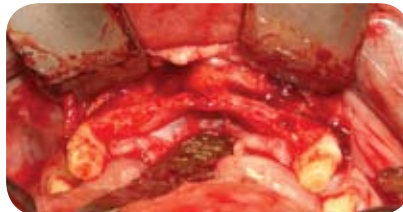


FIGURE 9. Photograph during bone graft surgery showing horizontal alveolar defect in the anterior mandible.



FIGURE 10. Photograph during bone graft surgery with surgical guide in place to illustrate the extent of the anterior mandibular alveolar deficiency requiring bone grafting.

5. Completion of orthodontics after initial healing of orthognathic surgery (**FIGURES 3A-B AND 4A**)

6. Removal of the original maxillary and mandibular anterior fixed partial dentures with fabrication of new maxillary and mandibular fixed provisional restorations by the restorative dentist in preparation for bone grafting and implant treatment (**FIGURE 4B**)

7. Fabrication of maxillary and mandibular surgical guides (duplication of the new provisionals) by the restorative dentist to be used by oral and maxillofacial surgeon for bone grafting and implant placement (**FIGURES 5-8, 10 AND 12**)

8. Bone graft to reconstruct the alveolar vertical and horizontal deficiencies in the

anterior maxilla and mandible by the oral and maxillofacial surgeon using bone harvested from the left iliac crest in block and particulate fashion^{6,7} (**FIGURES 6, 11 AND 13**)

9. Management of patient's provisional restorations during graft healing by the restorative dentist (approximately four to six months) (**FIGURE 13**)

10. Implant placement was done by the oral and maxillofacial surgeon using previously fabricated surgical guides with immediate indexing of implant positions at surgery to make fabrication of fixed implant-supported provisional restorations during implant healing pos-

sible.⁸ Healing abutments were connected for single surgery approach and to help manage soft tissue (**FIGURE 15**)

11. Adjustment and replacement of the anterior maxillary and mandibular provisional restorations were done by the restorative dentist after surgery to remain in place until implants were healed (four months) (**FIGURE 15**)

12. Placement of the fixed implant-supported provisionals that were made during implant healing by the restor-



FIGURE 11. Photograph during bone graft surgery showing cortico-cancellous block grafts to both the labial and lingual of the anterior mandible. Use of the surgical guide for reference during surgery indicated this approach was necessary. Particulate cortico-cancellous bone from the ilium was packed around the blocks and the entire graft was covered with a pericardium membrane before tension-free closure of the soft tissue.



FIGURE 12. Photograph taken immediately after bone graft surgery with surgical guide in place for reference. Confirms vertical and horizontal correction in the area.



FIGURE 13. Panoramic radiograph made immediately following bone graft surgery with adjusted maxillary and mandibular provisional restorations in place. Bone graft fixation screws evident in the maxillary and mandibular anterior areas.



FIGURE 14A. Occlusal photograph of the maxillary anterior area with the provisional restoration removed to show the result after bone graft healing prior to implant placement.



FIGURE 14B. Photograph of the mandibular anterior with the provisional restoration removed to show the result after bone graft healing prior to implant placement.



FIGURE 14C. Photograph of the anterior maxillary and mandibular edentulous areas after bone graft healing with the provisional restorations removed. Notice the relapse of the vertical correction, which occurred during healing, particularly in the maxillary anterior.



FIGURE 15. Postoperative panoramic radiograph made immediately following implant placement to the maxillary and mandibular anterior edentulous areas. Provisional restorations were adjusted and repositioned immediately after surgery by the restorative dentist.



FIGURE 16. Photograph of the maxillary and mandibular provisional restorations modified as indicated following implant placement. Notice the added gingival material to cover the remaining vertical soft tissue defects in the maxillary anterior.



FIGURE 17. Photograph of the final anterior mandibular implant supported fixed restoration. The patient is very happy with the functional and esthetic result. The photo also shows the need for soft tissue surgery around tooth No. 21 to create healthy fixed esthetic mucosa.

ative dentist and lab to manage soft tissue and initial esthetics (**FIGURE 16**)

13. Adjustment of the provisional restoration by the restorative dentist to meet the esthetic desires of the patient as well as to ensure proper function (**FIGURE 16**)

14. Final implant restorations by the restorative dentist for the anterior maxilla and mandible (**FIGURES 17 AND 18**)

15. Periodontal plastic soft tissue procedures by the periodontist for tissue coverage to mucogingival defects present on the mandibular premolar teeth

(original abutment teeth) (**FIGURE 17**)

16. Final restorations for the mandibular premolar teeth by the restorative dentist to complete treatment

17. Long-term maintenance by the restorative dentist with help from other disciplines as needed



FIGURE 18. Photograph of the final anterior maxillary and mandibular fixed, implant-supported restorations. Notice the pink porcelain abutting the maxillary gingival tissue. It is designed to provide optimum esthetics by hiding the remaining soft tissue deficiencies in the maxillary anterior. It is also helpful during function to block air escape that can occur during speech. It is important to design it to provide good access to the patient for hygiene.

Conclusion

Choosing the right team and working closely together results in the highest quality of treatment for the patient, expands the range of care we can offer, and makes the practice of dentistry more fun and rewarding for all involved. ■■■■

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