

Screening for MRSA in Trauma Patients

The Incidence and Complications of Methicillin-Resistant Staphylococcus aureus in a Community Level I Trauma Center.

Cook A, Berne J et al:

J Trauma 2009; 67 (July): 102-107

Admission MRSA screening of trauma patients does not effectively identify those at risk for development of MRSA infections.

Objective: To determine the incidence and consequences of methicillin-resistant *Staphylococcus aureus* (MRSA) in trauma patients admitted to a Level I trauma center.

Design: Prospective cohort study.

Participants: 1718 patients admitted to the trauma ICU.

Methods: In order to determine the incidence of MRSA colonization in patients being admitted, the nares of each patient were swabbed on admission. All the patients had screening and repeat swabs later on the 5th hospital day. The units' routine infection control practices were used, including isolation of patients when MRSA infection or colonization was noted. No specific treatment with antibiotics was started on the basis of the admission MRSA surveillance cultures alone. When MRSA infections were identified, antibiotic therapy was started according to the infection site, specimen culture, and sensitivity reports. Other data accumulated included demographics, admission Glasgow Coma Scale (GCS) and Injury Severity Scores (ISS), antibiotics administered at admission, infectious complications, ICU days, days on mechanical ventilation, hospital stay, and mortality. All associations between positive MRSA screening and infectious complications were evaluated.

Results: Of the 1718 trauma ICU patients, 71.6% had an admission nasal swab MRSA screening. *S. aureus* of both methicillin-sensitive and methicillin-resistant strains were cultured from 15.6% of patients. These admission nasal cultures were positive for MRSA in 71 patients, for a 5.8% MRSA carrier rate among all trauma ICU admissions. No demographic or injury characteristic was significantly associated with the MRSA carrier status at admission. Patients still in the ICU 5 days later (n=751) had the planned second screening. These patients were older, were more severely injured, and had lower GCS scores on admission. By day 5, 12 patients who had negative-admission MRSA cultures were then positive, while 59 patients who were MRSA positive at admission had become negative. The overall infection rate was 28%, but the MRSA infection rate turned out to be just 1.4%. Only 8.2% of patients who had positive MRSA cultures on days 1 or 5 actually developed a clinical MRSA infection. MRSA-related clinical infections were associated with longer ICU and hospital lengths of stay – 3 times longer in the ICU and in the hospital. The association curve for positive MRSA admission cultures and development of MRSA infection was just 0.59 – about equal to predicting with the toss of a coin.

Conclusions: MRSA infections affect only a minority of trauma patients but, when they occurred, prolonged ICU and hospital stays resulted. MRSA screening did not identify patients at risk for developing MRSA infection.

Reviewer's Comments: There is no question that MRSA infections prolong hospital stays and increase complication rates, but the presence or absence of nasal MRSA cultures at admission does not seem to influence the ultimate development of MRSA infection. (Reviewer-Sterling R. Schow, DMD).

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Keywords: Infection, *Staphylococcus aureus*, Methicillin

Print Tag: Refer to original journal article

Can Medical Tourism Increase Demand for Orthognathic Surgery?

Building Nonhospital-Based Platforms for Ambulatory Orthognathic Surgery: Facility, Anesthesia, and Price Considerations.

Carter J, Mohammad A:

J Oral Maxillofac Surg 2009; 67 (October): 2054-2063

The use of medical tourism or outpatient facilities can increase the number of orthognathic surgeries performed.

Objective: To describe methods for turning around the current marked reduction in the demand for orthognathic surgery.

Methods: This is a descriptive article pointing out that the loss of insurance coverage for orthognathic surgery has markedly reduced the demand for this treatment. This article also describes methods of cost reduction in order to make this type of surgery a desirable self-pay procedure. The authors identify the lack of third-party funding for orthognathic surgery as the prime deterrent to patients seeking this service. **Discussion:** Several strategies to reduce the cost of orthognathic surgery in order to make it more desirable by making it fit into a self-pay paradigm are described. One strategy is packaging all costs into a single price by taking the procedure out of inpatient hospitals and providing it in outpatient ambulatory facilities. A second strategy is to change the location where the surgery is provided to an off-shore location where the cost of providing the service is significantly lower. In order to do this, the facility must be comparable to those in the United States and the standards of care equal or better. For orthognathic surgery to remain part of the surgical scope of oral and maxillofacial surgery, the system of delivery, pricing, and value must be re-engineered to increase the appeal to patients seeking orthodontic care.

Conclusions: This type of surgery, which is indicated for the correction of facial deformities, must be packaged and delivered in a cost-effective manner that will make it appealing as a self-pay procedure.

Reviewer's Comments: This is an excellent article describing a change in the historical paradigm in order to provide this valuable service to patients at a cost that is affordable to patients without third-party coverage. (Reviewer-Edwin D. Joy, Jr, DDS).

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Keywords: Orthognathic Surgery

Print Tag: Refer to original journal article

Can Oral Hygiene Predict the Risk of Bacteremia?

Poor Oral Hygiene as a Risk Factor for Infective Endocarditis-Related Bacteremia.

Lockhart P, Brennan M, et al:

J Am Dent Assoc 2009; 140 (October): 1238-1244

Poor oral hygiene is associated with an increased risk of developing an IE-related bacteremia after tooth brushing. Bleeding following brushing was associated with an 8-fold increase in risk.

Objective: To determine if oral hygiene, gingival disease, or a combination of both is a risk factor for bacteremia.

Design: Double-blind, randomized, placebo-controlled investigation.

Participants: 194 patients.

Methods: All patients who met the inclusion criteria were randomly assigned to 1 of the 2 following groups: tooth brushing following antibiotic prophylaxis with 2 g amoxicillin or single-tooth extraction with a placebo. For all patients, oral hygiene was assessed with standard plaque, gingivitis, and calculus indices. All tooth-brushing patients were observed for a 2-minute brushing, and the oral cavity was then observed for bleeding after the brushing. Periodontal probing was also performed to determine periodontal health. Venous blood was drawn at 6 different times: before the procedure, during the procedure, immediately after the procedure, and at 20, 40, and 60 minutes after the procedure. Samples were then plated to evaluate for the growth of infective endocarditis (IE)-related bacteria. A bacteremia was determined by the presence of any bacteria seen with any of the sampling times.

Results: The mean age of the participants was 40.1 years, and 72.7% of the patients were African American. Ninety-eight species of bacteria were identified, and 35 of the identified species have been documented to be involved with IE. Almost 44% of these species were *Viridans streptococci*. Within the 2 groups, 22.5% of the IE-related bacteremias were identified in the tooth-brushing group, and 60.4% were associated with tooth extraction. Of the 98 detectable bacteremias, 93 were negative 20 minutes after the study period. No significant correlation was identified between the incidence of IE-related bacteremia and oral hygiene in the tooth-extraction group. In the tooth-brushing group, a significant correlation was found between IE-related bacteremia and oral hygiene, and the relationship was age related. For every year of age, the risk for IE-related bacteremias increased 6%. All parameters for evaluating oral hygiene were found to be predictors of IE-related bacteremias. Cases in which bleeding occurred after brushing had an 8-fold increase in the risk of developing a bacteremia after tooth brushing.

Conclusions: The incidence of IE-related bacteremias after tooth brushing increases with poor oral hygiene. Bleeding following tooth brushing had an 8-fold increase in the risk of producing an IE-related bacteremia.

Reviewer's Comments: This is a very well-done prospective investigation linking poor oral hygiene and the risk of an IE-related bacteremia. Therefore, oral hygiene can possibly be used as a measure of the risk of an individual developing an IE-related bacteremia. (Reviewer-David M. Grogan, DMD).

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Keywords: Oral Hygiene, Infective Endocarditis, Bacteremia

Print Tag: Refer to original journal article

Consider Performing Orthognathic Surgery in Outpatient Setting

Safe, Efficient, and Cost-Effective Orthognathic Surgery in the Outpatient Setting.

Farrell B, Tucker M:

J Oral Maxillofac Surg 2009; 67 (October): 2064-2071

Ambulatory settings can provide safe alternative locations for less-costly orthognathic surgery.

Objective: To discuss methods for improving the availability of orthognathic surgical treatment by obtaining as much insurance coverage as possible, reducing costs within a hospital environment, and using cost-effective outpatient surgical treatment facilities.

Design: This is a descriptive article discussing methods of reducing the cost of orthognathic surgery by using different strategies. **Discussion:** The first method is reducing costs. The second method is doing everything possible to encourage third-party payers to cover this service, which may include reducing the cost. Ways to reduce costs include altering the procedure so that it can be done safely in a shorter amount of time, choosing fixation devices that are of minimum cost to effectively do the job, and choosing a single surgical procedure rather than staging procedures. The third method is to do the procedure in a freestanding surgical facility outside of a traditional hospital. This can markedly reduce the cost of the surgery. However, there are several drawbacks, such as the requirement of managing the patient at home in the postoperative period by members of the family or other caregivers.

Conclusions: To increase the demand for orthognathic surgery, it is necessary to reduce the cost. This can be done by reducing operative time and the cost of fixation devices, ensuring that the maximum amount of third-party payment is procured by limiting the time of the operating room procedure if possible, and by moving the site to an outpatient facility if possible.

Reviewer's Comments: Another excellent article showing that a change of the current paradigm is necessary if we intend to keep orthognathic surgery as part of our specialty. (Reviewer-Edwin D. Joy, Jr, DDS).

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Keywords: Orthognathic Surgery, Outpatient

Print Tag: Refer to original journal article

Infection Rates Affected by Intraoperative Behavior

Impact of Intraoperative Behavior on Surgical Site Infections.

Beldi G, Bisch-Knaden S, et al:

Am J Surg 2009; 198 (August): 157-162

Surgical risk factors such as procedure duration, blood loss, and type procedure have more influence on surgical site infections than do patient factors such as age or use of nicotine, steroids, or other medications.

Objective: To identify intraoperative risk factors for surgical site infections that could be improved using extensive antiseptic measures and modified personnel behavior.

Design: Prospective cohort study.

Participants: 961 surgical patients available for follow-up 30 days after surgery.

Methods: Surgery suites were randomly assigned to a group of patients in whom extensive antiseptic measures would be practiced or to a group in which routine antiseptic measures were used. The primary outcome measure was the surgical site infection rate after 30 days. Normal methods for prevention of infection were used in all cases, including correct timing and duration of antibiotics. In the rooms where more extensive antiseptic measures were added to routine measures, all surgeons wore 2 pairs of gloves, changed the top pair of gloves every 2 hours (or more frequently, if needed), added an iodine-impregnated transparent foil over sterile drapes, and wore caps that covered their ears and neck. In addition, in bowel surgery, surgical instruments and gloves were replaced after every anastomosis. At the end of surgery, abdomens were rinsed with 5 L of Ringer's lactate, and the field was covered with new sterile drapes before closure. Before closure of subcutaneous tissue, another 1 L irrigation was done. Operating room behaviors, such as hectic movement, loud noise, and the presence of visitors in the suite were also reviewed as potential factors that could increase the rate of surgical site infections.

Results: Of the 1032 patients originally enrolled in the study, 961 (93%) were available for the 30-day postoperative follow-up. The surgical site infection rates were not different between the 2 groups. Of interest, however, most infections that occurred were superficial, whereas deep incision or intra-abdominal infections were infrequent. Among patient characteristics, only a body mass index >30 kg/m² was significant in increased infection rates. Intestinal anastomoses, surgeries lasting >3 hours, and lapses in aseptic principles were associated with higher infection rates. Finally, hectic personnel movements in the operating room, loud noise, and visitors in the suite during surgery were strongly associated with increased infection rates. Extensive antiseptic measures did not decrease surgical site infection rates but did greatly increase the cost of the procedures.

Conclusions: The discipline to adhere to aseptic principles by all surgical personnel is what best limits surgical site infections. Additional extensive antiseptic measures cost a lot but did not appear to further reduce surgical infection rates.

Reviewer's Comments: A really well-documented paper. Even though this article dealt primarily with general surgery abdominal procedures, the conclusions are obvious. Attention to detail, good organization, and adherence to sterile techniques are the best methods of infection prevention. (Reviewer-Sterling R. Schow, DMD).

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Keywords: Infection, Intraoperative Behavior

Print Tag: Refer to original journal article

Do Biofilms Play a Role in Bone Infection?

Microbial Biofilms in Osteomyelitis of the Jaw and Osteonecrosis of the Jaw Secondary to Bisphosphonate Therapy.

Sedghizadeh P, Kumar S, et al:

J Am Dent Assoc 2009; 140 (October): 1259-1265

SEM has shown evidence of biofilms in and on the surface of bone associated with osteomyelitis and bisphosphonate-related osteonecrosis.

Objective: To present the findings of microbial biofilms associated with osteomyelitis of the jaw (OMJ) and bisphosphonate-related osteonecrosis of the jaw (BRONJ).

Design: Retrospective cohort investigation.

Participants: 20 patients.

Methods: 10 patients had BRONJ, and 10 patients presented with OMJ. All patients were scheduled for surgical debridement or sequestrectomy. None of the patients had systemic signs of infection or any other risk factors for osteonecrosis such as radiation, chemotherapy, or steroid therapy. All of the surgical specimens were sectioned and underwent routine preparation for histopathological examination with scanning electron microscopy (SEM).

Results: Of the 10 patients presenting with BRONJ, 6 received parenteral bisphosphonates, and 4 received oral bisphosphonates. All specimens showed very large areas of well-developed biofilms, which consisted of microbial agents embedded in an extracellular polymeric substrate. In many of the specimens from OMJ patients the biofilms were embedded with one predominate genus, *Actinomyces*. In the specimens associated with BRONJ, the biofilms were colonized with multiple bacterial species, consistent with *Fusobacterium*, *Streptococcus*, *Actinomyces*, and *Bacillus*. In all the specimens examined, there existed inflammatory cells and septic clots adjacent to the biofilms, which are consistent with chronic inflammation.

Conclusions: For the first time, SEM has shown evidence of biofilms in and on the surface of bone associated with osteomyelitis and bisphosphonate-related osteonecrosis. The biofilms in osteomyelitis appear to be colonized by one predominate species, *Actinomyces*, while the biofilms of BRONJ appear to be colonized by multiple species.

Reviewer's Comments: I know very little about the etiology and make-up of biofilms, but the science of biofilms is starting to explain the difficulty in treating many chronic infectious processes. It appears that the bacteria embedded in these biofilms communicate with each other, which alters their growth rates and antimicrobial resistance. Also, routine culturing techniques do not detect these organisms, and routine antibiotics do not appear to affect the embedded organisms. (Reviewer-David M. Grogan, DMD).

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Keywords: Microbial Biofilms

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Simulated Surgery Done by Computer Programs

Three-Dimensional Imaging and Computer Simulation for Office-Based Surgery.

Schendel S, Jacobson R:

J Oral Maxillofac Surg 2009; 67 (October): 2107-2114

The software exists to do computer-simulated surgery for facial deformities.

Objective: To describe currently available computer programs for imaging and 3-dimensional reconstructions before orthognathic surgery. Using these patient-specific reconstructions, accurate diagnosis can be achieved and the surgery simulated multiple times to arrive at the best-possible surgical result, which then can be duplicated at the time of surgery.

Methods: Using a facial scan and a cone-beam CT scan, as well as scanning the dental casts, a 3-dimensional patient-specific anatomic reconstruction can be created. Diagnosis of the facial deformity can be made using tracings on this reconstruction, which includes the soft tissue of the face in 3 dimensions. The surgery can then be simulated on the reconstruction with various operations and amounts of movement of bone. The result in bone structure and soft tissue will be changed according to the bony surgery. This information can be transmitted by web to other members of the team including the orthodontist, who can also use this information for the orthodontic phase of the surgical event. **Conclusion:** The use of image-fusion technology now permits the creation of a patient-specific anatomic reconstruction on a routine basis. A more comprehensive diagnosis and treatment plan can be obtained by this method, allowing virtual orthodontics and surgery to be accomplished before the actual surgery. In the end, the treatment outcomes are improved.

Reviewer's Comments: A well-written article on the step-by-step use of computerized reconstruction for the diagnosis and treatment planning for orthognathic surgery. This can be used for diagnosis, surgical planning, and even as a teaching tool as residents can perform this surgery without worrying about the ultimate result as if it were the real surgery. (Reviewer-Edwin D. Joy, Jr, DDS).

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Keywords: Orthognathic Surgery, Diagnosis

Print Tag: Refer to original journal article

Is Obesity an Indicator of Postop Complications?

Body Mass Index and the Risk of Postoperative Complications With Dentoalveolar Surgery: A Prospective Study.

Waisath T, Marciani R, et al:

Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2009; 108 (August): 169-173

Body mass index is not correlated to postoperative complication rates in dentoalveolar surgery.

Objective: To examine the nature and frequency of postoperative complications in obese patients having dentoalveolar surgery.

Design: Prospective clinical study.

Participants: 1205 patients having dentoalveolar surgery.

Methods: All patients had a preoperative exam, which included documentation of height, weight, body mass index (BMI), and age. Patients were considered underweight if BMI was <18.5, normal if BMI was between 18.5 and 25, overweight if BMI was between 25 and 30, and obese if BMI was ≥ 30 . The number of postoperative visits was recorded for each patient for 1 year after surgery, with any postoperative complications during that time also being recorded. These complications included local surgical site problems and systemic problems such as nausea, constipation, and infection.

Results: Just over a third of the patients (441 of 1205) were categorized as obese, making it the most common weight group. Only 34 were underweight. Complications after dentoalveolar surgery occurred in 167 patients (13.9%). Postoperative infection was the most common of the complications, presenting in 3.82% of cases. No correlation could be found between postoperative complication rate and BMI or the number of postoperative visits and BMI. Age, however, was a predictor of both number of postoperative visits and occurrence of complications. Otherwise, there were no significant differences in postoperative complications when comparing height, weight, and BMI.

Conclusions: BMI is not statistically correlated with higher complication rates or an increased number of postoperative visits after dentoalveolar surgery.

Reviewer's Comments: Obesity has been shown to be a significant risk factor for anesthesia procedures affecting intraoperative morbidity and mortality, but it does not appear to be a big risk factor for dentoalveolar postoperative complications. (Reviewer-Sterling R. Schow, DMD).

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Keywords: Dentoalveolar Surgery, BMI

Print Tag: Refer to original journal article

Controlling Chronic Subluxation--Try Miniplates

Treatment of Chronic Mandibular Dislocations Using Miniplates: Follow-Up of 8 Cases and Literature Review.

Vasconcelos B, Porto G, et al:

Int J Oral Maxillofac Surg 2009; 38 (October): 933-936

Miniplates can be successfully utilized for the control of chronic mandibular subluxation. The greatest liability is for plate fracture necessitating a second procedure for plate retrieval.

Objective: To present the outcomes of utilizing miniplates to control chronic condylar subluxation.

Design: Retrospective clinical investigation.

Participants: 8 patients.

Methods: All patients presented for the correction of chronic subluxation. All patients experienced ≥ 5 condylar subluxations per month. Patients had also failed conservative therapies, including self-limiting jaw motions and chin cup therapy. Exposure of the joint was done via a preauricular approach. Once the eminence was identified, a 2.0 L-shaped miniplate was selected. The short arm of the plate was stabilized to the arch with two 6 mm screws and the long arm was contoured inferior and anterior to the eminence to limit condylar motion. Miniplates were placed bilaterally. Patients were followed postoperatively for 48 to 69 months.

Results: The majority of the patients were female with ages ranging from 22 to 42 years. The mean preoperative maximum interincisal opening was 42.75 ± 11.53 mm, and the mean postoperative opening was 45.62 ± 8.52 mm. There were no facial nerve injuries. The primary complication was the unilateral fracture of a miniplate in 2 patients. Both patients were treated with bilateral eminectomies and experienced no further subluxations.

Conclusions: Miniplates can be successfully used for the treatment of chronic subluxation, with the most significant liability being plate fracture. Both plates fractured at the site of bending during the adaption process.

Reviewer's Comments: This is yet another paper showing the liability of using miniplates to control chronic subluxation. In the past, several authors have determined that the use of miniplates should not be seen as the treatment of choice due to the possibility of fractures. (Reviewer-David M. Grogan, DMD).

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Keywords: Surgery, Mandibular, Dislocations

Print Tag: Refer to original journal article

Orthopedic Traction Can Correct Midface Deficiency

Orthopedic Traction of the Maxilla With Miniplates: A New Perspective for Treatment of Midface Deficiency.

De Clerck H, Cornelis M, et al:

J Oral Maxillofac Surg 2009; 67 (October): 2123-2129

Traction on miniplates can be successfully used for the treatment of midface deficiency.

Objective: To describe 3 cases of successful correction of midface deficiency using bone anchorage with miniplates and orthopedic traction.

Design: A descriptive article of patients with midface deficiency who were successfully treated with orthopedic elastic traction on bone-anchored miniplates and followed up for up to 38 months.

Participants: 3 patients with midface deficiency.

Methods: 3 patients aged 10 to 11 years with maxillary deficiency were entered into the study. Under anesthesia, 4 bone-anchored miniplates were placed (2 in the maxilla and 2 in the mandible). After 2 weeks, elastic traction was placed on the miniplates to apply a forward force on the bone of the maxilla. Traction was kept in place for 7 months for 2 patients and 12 months for 1 patient. The midface deficiency was adequately corrected. An anterior crossbite was also corrected by moving the entire midface, including the orbital rims, nose, and upper lip significantly forward. There was no movement of the mandible in these cases. The patients were followed up for 28 months with no significant relapse.

Conclusions: Miniplate anchorage in the bone of the maxilla and mandible and the application of elastic traction to these plates can successfully correct significant maxillary hypoplasia.

Reviewer's Comments: This paper details a relatively simple procedure that showed marked success in the correction of this facial deformity on 3 patients. It certainly should be considered in the armamentarium of orthodontists and oral surgeons. (Reviewer-Edwin D. Joy, Jr, DDS).

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Keywords: Orthognathic Surgery, Maxillary

Print Tag: Refer to original journal article

Suture Method Affects Second Molar Periodontal Status

Influence of Different Suturing Techniques on Periodontal Health of the Adjacent Second Molars After Extraction of Impacted Mandibular Third Molars.

Cetinkaya B, Sumer M et al:

Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2009; 108 (August): 156-161

Anchor sutures with retention provided by adjacent second molars may be an aid to improving second molar periodontal status after impacted mandibular third molar removal.

Objective: To compare 2 different suture techniques on the periodontal health of mandibular second molars after removal of the associated lower third molars.

Design: Prospective clinical study with a split-mouth design.

Participants: 15 patients with bilaterally comparable impacted mandibular third molars.

Methods: All patients had full bony mesioangular or vertical impacted mandibular third molars needing removal. All patients were aged <25 years, were non-smokers, and had taken no medications that could influence wound healing. All third molars were clinically asymptomatic. Custom-made acrylic guides for periodontal probing of the second molars were constructed before third molar removal. The third molars bilaterally were removed in one sitting, all by the same surgeon using the same flap design. Closure of the surgical sites was with a single loop on one side and the authors' well-described anchor suture on the other side. Closure type was randomized side-to-side by coin toss. Postoperative periodontal health was evaluated 6 months later at the second molar.

Results: All 15 patients completed their postoperative follow-up visit. Mean patient age was 18.53 years. Mean surgical time was just over 16 minutes per tooth. There was no significant difference in the difficulty of the cases. The probing pocket depth and clinical attachment level at the distal of the lower second molars before third molar removal were similar in sites that were closed with either suturing technique. Six months after surgery when simple suturing was used, there were significant increases of probing depth and clinical tissue attachment levels. When the anchor suture technique was used, the probing depths and attachment levels were virtually unchanged from preoperative measurements.

Conclusions: The "anchor suture" technique used for closure of mandibular impacted third molar surgical sites showed improved spontaneous periodontal healing along the distal root of the second molars.

Reviewer's Comments: This was a very small study with small differences in healing that many of us might not consider clinically significant. The proposed "anchor suture" technique is well illustrated in the paper and is intended to reposition the soft-tissue flaps in better approximation to the second molar than a simple suture technique. (Reviewer-Sterling R. Schow, DMD).

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Keywords: Dentoalveolar Surgery, Suturing, Periodontal, Mandibular

Print Tag: Refer to original journal article

There's More Than One Way to Treat Ranula

Oral and Plunging Ranulas: What Is the Most Effective Treatment?

Patel M, Deal A, et al:

Laryngoscope 2009; 119 (August): 1501-1509

Sublingual gland removal with ranula evacuation is the most predictable treatment for all ranulas with the fewest complications.

Objective: To review the literature on the treatment of ranulas and to present the authors' series of ranula patients.

Design: Retrospective case study and literature review.

Participants: 26 patients treated by the authors and 864 cases identified and reviewed in professional literature.

Methods: For the 26 ranula patients in the authors' institution, data gathered included patient demographics, ranula size and location, type of surgery performed, and postoperative complications. A literature search identified another 846 cases of ranula or plunging ranula, which included the same information retrieved for each of the authors' patients. Twelve different treatment methods for ranula and/or plunging ranula were reviewed, including complications, recurrence, and approach descriptions. Finally, an 8-question survey was sent to members of the American Head and Neck Society, which was intended to help identify current treatment approaches for ranula and plunging ranula.

Results: The authors' reviewed cases included 16 oral and 10 plunging ranulas. Seven of these patients had previous failed treatment including aspiration, marsupialization, and submandibular gland removal. The authors treated their patients with transoral excision in all but 1 instance in which a cervical incision was also used. In half their cases, they removed the involved sublingual salivary gland and tried to excise the ranula. For plunging ranulas, a combined sublingual gland and ranula excision was attempted. In the 864 literature review cases, there were at least 117 plunging ranulas. Treatments included marsupialization, ranula excision, excision of sublingual gland and ranula, and sublingual gland excision with ranula evacuation. The most common complication was recurrence at just 3% with gland excision and up to 82% with aspiration or marsupialization. Other treatments were combinations of oral and cervical approaches with or without attempts to excise the ranula itself. Injections of OK-432 for sclerotherapy were also attempted. Complications included recurrence, lingual nerve damage, hematoma, infection, and Wharton's duct injury. When the treatment was removal of the sublingual gland with ranula evacuation, recurrence was just 1%. Surprisingly, questionnaire responses still included a wide variety of procedures, including both oral and cervical approaches.

Conclusions: The definitive treatment of ranula or plunging ranula with the lowest recurrence and complication rates is transoral sublingual gland excision with evacuation of the mucous contents in the ranula. Excising the ranula is not necessary, nor is a cervical approach warranted.

Reviewer's Comments: This good paper contains an extensive review of the pathophysiology of ranula and plunging ranula and the various treatment methods that have been used for them. (Reviewer-Sterling R. Schow, DMD).

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Keywords: Pathology & Immunology, Ranula

Print Tag: Refer to original journal article

Tapered Implants Create Stability Without Grafting

Placement of Tapered Implants Using an Osteotome Sinus Floor Elevation Technique Without Bone Grafting: 1-Year Results.

Nedir R, Nurdin N et al:

Int J Oral Maxillofac Implants 2009; 24 (August): 727-733

Using tapered implants, initial implant stability can be achieved in limited posterior maxillary alveolar bone, lifting the sinus membrane without placing a bone graft.

Objective: To evaluate tapered implant performance in the atrophic maxilla while doing an osteotome sinus floor elevation without grafting.

Design: Prospective clinical evaluation.

Participants: 32 patients needing posterior maxillary implants to support a fixed prosthesis.

Methods: All patients had healed in the implant site at least 3 months after tooth removal. The patients had ≤ 6 mm residual alveolar bone in the areas where implants were to be placed. Implant sites were prepared with round burs of increasing diameter to within a 1 to 2 mm distance from the maxillary sinus floor. Next, a 2.8-mm diameter sinus osteotome was used to fracture the sinus floor and elevate it about 2 to 3 mm. The implant site was enlarged using a 3.5-mm diameter sinus osteotome. Further elevation of the sinus floor and Schneiderian membrane was done with insertion of the implant. Tapered Effect Straumann implants 4.8 mm in diameter at the collar and 4.1 mm in diameter at the apex or 6.5 mm at the collar and 4.8 mm at the apex and 8 to 10 mm in length were inserted. The implant sites were allowed to heal unsubmerged. Graft material was not placed into the implant site. Residual crestal bone height was determined preoperatively, postoperatively, and at 1 year postoperatively.

Results: 44 implants 8 mm in length and ten implants 10 mm in length were placed in the 32 patients. The mean residual alveolar bone height before implant placement was 3.8 mm. During site preparation, the sinus membrane was perforated at 5 areas. All implants were primarily stable when placed. A mean 4.2 months after placement, abutments were connected at 20 Ncm. A year after implant placement, the mean crestal bone loss around the implants was less than 0.5 mm. The mean gain in alveolar bone height at the sinus floor was 2.5 mm. The net bone gain resulting was 2.3 ± 1.8 mm.

Conclusions: A sinus elevation procedure with osteotomes and immediate placement of tapered implants can result in implant stability and a gain in alveolar bone height at the sinus floor without grafting.

Reviewer's Comments: Tapered implants with a modified roughened surface provide primary implant stability in even small amounts of residual alveolar bone. Space maintenance of small volume beneath an elevated sinus membrane allows new bone formation without additional grafting. No implants were lost in this small clinical study. (Reviewer-Sterling R. Schow, DMD).

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Keywords: Implants, Osteotome

Print Tag: Refer to original journal article

Does Gingival Thickness Affect Peri-Implant Crestal Bone Loss?

The Influence of Soft Tissue Thickness on Crestal Bone Changes Around Implants: A 1-Year Prospective Controlled Clinical Trial.

Linkevicius T, Apse P, et al:

Int J Oral Maxillofac Implants 2009; 24 (August): 712-719

Gingival thickness in implant sites may be an indicator of crestal bone loss that can be expected in the year after implant placement.

Objective: To see how gingival tissue thickness influences crestal bone loss around dental implants after 1 year.

Design: Prospective, controlled, clinical trial.

Participants: 19 patients needing implant reconstruction.

Methods: 2 implants were placed adjacent to each other in each patient. All implant sites were in healed bone where no osseous augmentation had been done and was not anticipated. There was enough gap to accommodate the 2 implants with at least 3 mm between the fixtures. Implants were placed in a single-stage non-submerged technique. The test implant's platform was left 2 mm supracrestally, whereas the adjacent control implant had its platform level with the alveolar crest. Healing abutments were placed on all implants, and radiographs were taken immediately. After 2 months healing in the mandible and 4 months healing in the maxilla, additional radiographs were taken when healing abutments were removed, at framework fitting, and after prosthesis insertion. Patients were seen again at 6 and 12 months after prosthetic treatment and had additional radiographs taken. As part of the radiographic evaluation, note was made of the patients' gingival thickness, which was classified as either <2 mm or >2 mm to evaluate differences in crestal bone loss.

Results: 46 implants (23 test and 23 control) were placed, 40 in the mandible and 6 in the maxilla. All the implants integrated and were restored. Mean crestal bone loss around implants with platforms 2 mm supracrestal in thin mucosa was approximately 1.45 mm and just 0.17 mm when the mucosa was thick. On control implants, the mean crestal bone loss was 1.87 mm in areas of thin mucosa and thick mucosa. This crestal bone loss was expected in both groups of controls because both the microgap between implant and healing abutment as well as the polished implant collar were placed at the alveolar crest.

Conclusions: Thin peri-implant mucosal tissues contribute to crestal bone loss 1 year after implant placement, even if the polished implant collar and the implant/abutment microgap are kept well above the alveolar crest. In thick mucosa, significant crestal bone loss can be avoided if the implant/abutment junction is kept 2 mm above crestal bone.

Reviewer's Comments: Mucosal membrane thickness is easily determined with a periodontal probe. In areas where implants are planned, thin gingival tissues might benefit from grafting to increase their thickness prior to implant placement. (Reviewer-Sterling R. Schow, DMD).

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Keywords: Implants, Soft Tissue, Crestal Bone

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Changes in Graft Volume After Sinus Lifts--Does Graft Type Make a Difference?

Long-Term Changes in Graft Height After Maxillary Sinus Floor Elevation With Different Grafting Materials: Radiographic Evaluation With a Minimum Follow-Up of 4.5 Years.

Zijderveld S, Schulten E, et al:

Clin Oral Implant Res 2009; 20 (July-August): 691-700

In long-term follow-up, reductions in graft heights after sinus lifts with beta-tricalcium phosphate (β -TCP) or autologous bone had equal vertical height reduction.

Objective: To determine the extent of vertical dimension changes in graft height over time in maxillary sinus lift procedures comparing beta tricalcium phosphate and autologous mandibular monocortical bone cores as grafting material.

Design: 5-year clinical study.

Participants: 20 consecutive patients needing vertical augmentation of the posterior maxilla (sinus lifts) for subsequent implant placement.

Methods: One group of patients had their sinus lifts grafted with autogenous monocortical bone cores from the anterior mandible. The other group had their grafts with β -tricalcium phosphate (β -TCP). Four patients who needed sinus lifts bilaterally had one side grafted with β -TCP and the other with autologous bone. In all, 14 sinuses were grafted with β -TCP and 10 with autologous bone. Other than sinus lifts, no other grafts were needed in the area. Five months after grafting, 60 Straumann implants were placed (36 in the β -TCP group and 24 in the autologous graft group). Patients were followed up for a minimum 4.5 years with panoramic radiographs taken preoperative, just after grafting, at implant placement, 1 year after implant replacement, and 5 years after placement. At each time interval, graft height above the original sinus floor was measured in 3 locations.

Results: The 2 groups were similar in age and gender. Mean residual native alveolar bone in the posterior maxilla prior to the sinus lifts was 5.4 to 7.0 mm in the 3 measured sites in each sinus. Graft vertical height was measured on the radiographs just after grafting, a mean of 7.5 months later, and again a mean of 64 months after surgery. The height of the grafts at placement was not significantly different between groups, and the bulk of the height reduction occurred between graft and implant placement time and again between implant placement and the 7.5-month evaluation. After this time, there was very little additional vertical graft loss.

Conclusions: Both β -TCP and autologous mandibular bone grafted into sinus floors experienced radiographic vertical reduction over the 5-year study. The greatest reduction was seen in the first year and a half, after which little change occurred. No significant differences in vertical loss or timing of this loss were noted.

Reviewer's Comments: There are lots of tables and data in this paper, which can make it a little difficult to read. No mention was made of implant failure, so I guess we can assume everything that was placed was ultimately restored. (Reviewer-Sterling R. Schow, DMD).

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Keywords: Grafts, Maxillary, Elevation, Radiographic

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Image-Guided Navigation Helpful

Navigation-Guided Gap Arthroplasty in the Treatment of Temporomandibular Joint Ankylosis.

Yu H, Shen G, et al:

Int J Oral Maxillofac Surg 2009; 38 (October): 1030-1035

The accuracy of the system was within 1 mm. The navigational system allows for real-time location of all instrumentation, which allows one to avoid critical anatomy.

Objective: To evaluate the outcomes of utilizing image-guided navigation in performing gap arthroplasties.

Design: Retrospective clinical investigation.

Participants: 4 patients.

Methods: All patients were presenting for the treatment of a unilateral TMJ ankylosis. Titanium positioning screws were placed in the maxilla in all patients to serve as navigational markers. All patients were then scanned, and the CT data were loaded into MIMICS software to produce stereolithographic images. Utilizing a mirroring tool, the anatomy of the normal joint was superimposed over the ankylosed side. This aided in establishing normal fossa and eminence anatomy. The navigational instrumentation was calibrated to produce an accurate match of the intraoperative anatomy and the virtual images created preoperatively. The joints were approached from a preauricular incision, and the ankylotic bone was resected according to the preoperative plan. A temporalis myofascial flap was rotated into the surgically created gap.

Results: There were no complications, and postoperative maximum interincisal opening was 33.5 mm (range, 30 to 37 mm). In all cases, the accuracy of the system was within 1 mm. There was a direct correlation to the preoperative 3-dimensional imaging and the anatomy encountered during the procedure. The navigational system provided the ability of real-time location of all instrumentation, which allowed for the protection of critical anatomy.

Conclusions: The use of an image-guided navigational system resulted in the successful resection of ankylotic bone, while avoiding critical anatomy.

Reviewer's Comments: I have no experience in utilizing navigational systems, but this appears to be an excellent application for the technology. Since there are usually no significant differences between ankylotic bone and the cranial base, this system would allow one to progress with less trepidation. The real-time location of all burs would be greatly appreciated in this busy anatomical region. (Reviewer-David M. Grogan, DMD).

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Keywords: Surgery, Arthroplasty, TMJ Ankylosis

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Positional Changes Can Affect TMJ Symptoms

The Effects of Changing Position and Angle of the Proximal Segment After Intraoral Vertical Ramus Osteotomy.

Ueki K, Hashiba Y, et al:

Int J Oral Maxillofac Surg 2009; 38 (October): 1041-1047

The angle and position of the proximal segment can be altered following an IVRO. This alteration can result in improvement of TMJ symptoms.

Objective: To evaluate changes in the proximal segment following an intraoral vertical ramus osteotomy (IVRO).

Design: Retrospective clinical investigation.

Participants: 29 patients.

Methods: All patients were presenting for surgical correction of mandibular prognathism with mandibular asymmetry. Sixteen patients were treated with an IVRO without fixation, and the remaining 13 patients were treated with a Le Fort I osteotomy and IVRO. All patients were placed in intermaxillary fixation (IMF) for 1 week and then switched to elastics. All patients had a preoperative CT and a postoperative CT within 3 months. MRIs of the TMJ were taken preoperatively and within 6 months' postoperatively. Preoperative and postoperative joint symptoms were documented. CTs were analyzed for proximal segment positional changes, and MRIs were analyzed for changes in disc position. Alterations in trigeminal nerve function were also documented via trigeminal sensory-evoked potential.

Results: The horizontal condylar angle was different in the nondeviated and deviated sides preoperatively, but no difference was noted postoperatively. The sagittal ramus angle was found to increase on both the deviated and nondeviated sides. MRI analysis of the discs revealed that 24 discs were anteriorly displaced, with and without reduction preoperatively. Improvement was seen in the displaced discs on the nondeviated side in 75% of cases, while only 31% showed improvement on the deviated side. TMJ symptoms were improved in 97% of patients. All patients had normal nerve function postoperatively, but proximal segments that were medially displaced showed delayed recovery.

Conclusions: The angle and position of the proximal segment can be altered following an IVRO, and these changes may result in an improvement of TMJ symptoms. Medially displaced proximal segments can delay nerve function recovery.

Reviewer's Comments: A very well-done investigation yielding results consistent with previous investigations. One new interesting point was the medial displacement of the proximal segment being associated with delayed nerve recovery. (Reviewer-David M. Grogan, DMD).

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Keywords: Mandibular, IVRO, TMJ

Print Tag: Refer to original journal article

Transverse Maxillary Stability Assisted by Transpalatal Device

Transverse Maxillary Stability Assisted by a Transpalatal Device: A Retrospective Pilot Study of 9 Cases.

Charezinski M, Balon-Perin A, et al:

Int J Oral Maxillofac Surg 2009; 38 (October): 937-941

The addition of a transpalatal device as an expander and postoperative stabilizer resulted in a very stable outcome. Expansion was greater in the posterior than in the cuspid region due to an intact arch wire and the posterior positioning of the device.

Objective: To present the outcomes of a combination of a Le Fort I osteotomy and the utilization of a transpalatal device on expansion stability.

Design: Retrospective clinical investigation.

Participants: 9 patients.

Methods: All patients presented for the correction of maxillary deformities including a transverse deficiency of ≤ 6 mm. All patients underwent orthodontic therapy prior to surgery. The transpalatal device was placed in the region of the second bicuspid or first molar. The device was secured with plates screwed to the bony hard palate. A 1-cm osteotomy was created between the central incisors starting at the anterior nasal spine. The entire maxilla was then mobilized via a conventional Le Fort I osteotomy. The midline osteotomy was then advanced for a total of 2 cm, and the transpalatal device was activated, correcting the transverse discrepancy with no overcorrection. The maxilla was then fixed with plate stabilization. Models taken before surgery, 6 months after surgery, and 12 months after surgery were evaluated for palatal expansion and stability.

Results: In all cases, the transverse deficiencies were corrected. Complications associated with the transpalatal devices were minimal: 1 infection treated with antibiotics and a loose device at the end of the retention period (neither complication was of any significant consequence). The expansion was greater in the region of the first molar (2.70 to 6.26 mm) than at the level of the cuspid (-2.01 to -3.15 mm). No significant changes were noted in the measurements between the 6- and 12-month postoperative models. Only 1 patient showed moderate relapse, but this did not affect the final occlusion.

Conclusions: The transpalatal device was utilized as a palatal expander and a stabilizer, resulting in a more stable outcome. Expansion at the level of the cuspid was less than posterior expansion secondary to the fact that the patients retained a continuous orthodontic arch wire.

Reviewer's Comments: This is an interesting paper, but moderate surgical expansion is a very stable procedure. One advantage of the transpalatal device is that it eliminates the need for complete palatal osteotomies. One concern with the paper is that no mention was made of visualizing the completion of the midpalatal split, which can indicate that the expansion was achieved through tooth tipping (Reviewer-David M. Grogan, DMD).

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Keywords: Maxillary, Transpalatal, Osteotomy

Print Tag: Refer to original journal article

Second-Generation Locking Reconstruction Plates--How Good Are They?

Mandibular Reconstruction and Second Generation Locking Reconstruction Plates: Outcome of 110 Patients.

Coletti D, Ord R, et al:

Int J Oral Maxillofac Surg 2009; 38 (September): 960-963

The overall complication rate was found to be 36% with plate exposure, with plate fracture being the most common complication.

Objective: To present the indications and contraindications for utilization of a second-generation locking reconstruction plate (LRP).

Design: Retrospective clinical investigation.

Participants: 110 patients.

Methods: All patients were presenting for reconstruction of a mandibular continuity defect secondary to pathology or trauma. In all cases, a 2.4-mm LRP from Synthes or a 2.3-mm LRP from Stryker were used for segment reconstruction. The following data were recorded: routine demographics, etiology, length and site of reconstruction, presence or absence of dentition, and use of radiation therapy. Reconstruction was categorized into the following groups: 1, plate only; 2, plate and soft-tissue flap; 3, plate and primary vascularized bone reconstruction; 4, plate and primary nonvascularized bone graft; and 5, secondary bone graft reconstruction.

Results: The average length of defect was 8.6 cm. The site of reconstruction was as follows: lateral (62%), anterior (23%), anterolateral (9%), and condylar (6%). Thirty-five percent of patients were edentulous, and 65% had at least partial occlusion. The average time to hardware failure was 14 months. There were 40 complications, most commonly plate exposure (13%) and plate fracture (11%), followed by infection (7%), loose hardware (1.8%), and malocclusion (3.6%). Of the plate fractures, 92% were placed laterally, and 100% of patients had postoperative dentition. What was found to be significantly associated with fractured plates was that 92% had been reconstructed with just a plate or a plate and soft-tissue reconstruction. The overall rate of complications and radiation were not found to be statistically significant, but plate exposure and irradiated tissue were statistically significant.

Conclusions: The overall complication rate was 36%, and the average time associated with hardware failure was 14 months. Plate exposure was associated with irradiated patients, with lateral defects reconstructed with a plate only or plate and soft-tissue reconstruction. Plate fracture was associated with lateral defects, the presence of postoperative dentition, and plate-only or plate and soft-tissue reconstruction.

Reviewer's Comments: This was a very well-done retrospective investigation revealing the successes with second-generation locking reconstruction plates. Those of us involved in reconstruction prior to the advent of reconstruction plates understand the tremendous advancements associated with these plates. They have made reconstruction much more predictable. (Reviewer-David M. Grogan, DMD).

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Keywords: Bone, Mandibular Reconstruction

Print Tag: Refer to original journal article

Pathogens Associated With Soft-Palate Clefts

Cleft Soft Palate Reconstruction: Prospective Study on Infection and Antibiotics.

Myburgh H, Butow K:

Int J Oral Maxillofac Surg 2009; 38 (September): 928-932

A wide spectrum of pathogenic organisms was identified from soft-tissue clefts, and most showed antibacterial resistance to the most commonly used antibiotics. A significant amount of cross-contamination was seen secondary to changing diapers.

Objective: To identify the spectrum of intraoral organisms associated with cleft palate in children and to identify organisms associated with postoperative complications.

Design: Prospective clinical investigation.

Participants: 100 babies.

Methods: All babies were presenting for soft-palate surgery. The soft palate was closed as per the technique described by Kriens and modified by Bütow. Swabs of the soft palate/nasopharynx interface were taken at the time of surgery and from the soft-palate reconstruction on 2, 4, and 6 days' postoperatively. All samples were plated and cultured, and antibiotic sensitivities and resistance were determined. All babies were fed via a nasogastric tube for 7 days to reduce the potential for wound contamination.

Results: At the time of surgery, 38 babies showed normal oral flora, and the remaining babies had 15 different pathogenic organisms. The most frequent pathological organisms identified included *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Candida albicans*, and *Escherichia coli*. At postoperative day 2, 13 pathological organisms were identified, and the spectrum remained relatively similar during the next 2 samples. Wound complications were found in 9 babies. Five patients developed oronasal communications. The remainder had lesser wound breakdown. Two of the babies who developed an oronasal communication had routine oral flora cultures, and 3 had the following pathogens associated with the breakdown: *Enterobacter agglomerans* and *Enterobacter cloacae*, *Haemophilus influenzae*, and *Serratia marcescens*. Babies with partial wound breakdown had *S. aureus* cultured from the sites. Microorganisms showed resistance to the most commonly utilized antibiotics: Augmentin, ampicillin, and first- and second-generation cephalosporins.

Conclusions: A wide spectrum of organisms can be cultured from soft-palate clefts, and many of the pathogens showed a high degree of resistance to the more commonly used antibiotics. The pathogens isolated that are commonly associated with the colon and urinary tract probably represent cross-contamination from parents changing diapers.

Reviewer's Comments: This interesting paper reveals the degree of antibiotic resistance seen in a given population. All of the babies were hospitalized for the entire 7 days. It would be interesting to see if the pathogen levels would change if the babies were sent home. I was also amazed at the degree of cross-contamination secondary to changing diapers. That, in itself, is an alarming finding. (Reviewer-David M. Grogan, DMD).

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Keywords: Palate, Reconstruction, Infection, Antibiotics

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