

## Suspect Septic Arthritis With Sudden Pain, Swelling of TMJ

*Septic Arthritis of the Temporomandibular Joint: A Retrospective Review of 40 Cases.*

Cai X-Y, Yang C, et al:

J Oral Maxillofac Surg 2010; 68 (April): 731-738

Although rare, septic arthritis occurs in the TMJ and is manifested by sudden pain, swelling, and increased fever.

**Objective:** To review cases treated in the authors' clinic and to describe the characteristics of the disease and response to management.

**Design:** Descriptive study of the management of cases of septic arthritis of the TMJ treated at the authors' hospital.

**Participants/Methods:** 40 patients, 26 men and 14 women, were treated for septic arthritis of the TMJ. Demographics, symptoms, treatment methods, results, and follow-up were recorded retrospectively in all cases.

**Results:** All patients had trismus and tenderness in the TMJ, and sudden onset was characteristic. Thirty-three patients had acute malocclusion with deviation of the mandible to the contralateral side, which occurred suddenly. Increased joint effusion was confirmed by MRIs in 7 patients. Joint fluid obtained in 35 patients had a high level of neutrophils and fibrin and was cloudy and yellow in appearance. *Staphylococcus* was cultured from 5 patients' joint fluids. Treatment was by arthrocentesis and antibiotic therapy. Major sequelae occurred in 11 patients including fibrosis in 2 patients and postinfectious osteoarthritis in 9 patients.

**Conclusions:** Although rare, septic arthritis should be suspected in any patients with sudden onset of pain, swelling, and malocclusion in the area of the TMJ.

**Reviewer's Comments:** Although this is a rare disease, this paper points out that it does occur and should be suspected in cases of sudden onset of pain and swelling in the TMJ. (Reviewer-Edwin D. Joy, Jr, DDS).

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Keywords: TMJ, Septic Arthritis, Management

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MMA is at least as effective as an autotitrating positive airway pressure in treating OSAS.

**Objective:** To compare the effectiveness of maxillomandibular advancement (MMA) surgery with that of autotitrating positive airway pressure (APAP) in the treatment of severe obstructive sleep apnea-hypopnea syndrome (OSAHS).

**Design:** Prospective, randomized controlled trial.

**Participants:** 50 consecutive patients with severe OSAHS.

**Methods:** All patients had polysomnographic (PSG) evaluations (to confirm their diagnosis of OSAHS) prior to treatment and also after their treatment with MMA or APAP. The same physician specifically trained in sleep medicine evaluated all the polysomnographic studies. Parameters assessed for all patients included severity of their OSAHS, daytime sleepiness and subjective satisfaction of treatment. Complications were also recorded. Patients treated with MMA had a tracheotomy for early postoperative airway management. Surgery included sagittal ramus and LeFort I osteotomies with bimaxillary advancement an average of 11 mm with rigid osseous stabilization. Tracheostomies were maintained for 4 to 5 days, and patients were discharged within 1 week. Patients treated with APAP used a nasal mask attached to a flow generator that detected 3 parameters for autotitration; these included forced oscillation, flow limitation, and snoring.

**Results:** 25 patients were treated with MMA and 25 with APAP. For surgery patients, the mean body mass index (BMI) was 32.7, and the mean age was 49.1 years. The mean postoperative BMI was 31.4, the mean follow-up was 13 months, and the mean Apnea-Hypopnea Index (AHI) decreased from 56.8 to 8.1. The mean preoperative Epworth Sleepiness Scale (ESS) was decreased after surgery from 11.6 to 7.7. All but 1 of the surgery patients said they would repeat the procedure if necessary. Of the 25 APAP patients, 3 stopped treatment after 1 month and resorted to surgery. The mean age of the APAP patients was 48.7 years, and their mean BMI was 30.2. The mean pretreatment AHI of the APAP patients was 50.3 and was reduced to 6.3 with treatment. The mean ESS was reduced from 11.2 to 5.9 with APAP. All surgery patients had transient maxillary/mandibular paresthesias with approximately one-third with persistent, but not disturbing, paresthesia. One patient needed some orthodontic correction after surgery. With APAP, 3 patients dropped out and had surgery, 4 required multiple consultations before treatment was effective, and 2 patients needed different devices.

**Conclusions:** MMA is at least as effective as APAP in treating OSAHS and is successful when APAP is unsuccessful.

**Reviewer's Comments:** A very positive commentary on the suitability of MMA for treatment of OSAHS. The complication rates were quite low. Follow-ups were  $\geq 1$  year for all subjects with no documented significant relapse of results. Were the tracheostomies necessary? Was the length of hospitalization reasonable? (Reviewer-Sterling R. Schow, DMD).

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Keywords: Obstructive Sleep Apnea, Adults, Orthognathic Surgery, Ventilation

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## Does Widening of Maxilla Increase Risk of Avascular Necrosis?

*The Influence of Expansion on Intraoperative Bone Blood Flow in Multisegmental Maxillary Osteotomies: An Experimental Study.*

Kretschmer WB, Baciut G, et al:

Int J Oral Maxillofac Surg 2010; 39 (March): 282-286

Minimizing transverse corrections to <4 mm while sparing the descending palatine artery leads to predictable vascular recovery in multisegmental maxillary osteotomies.

**Objective:** To compare the intraoperative bone blood flow to multiple segments following 3-piece Le Fort I osteotomies.

**Design:** Prospective animal study. **Subjects:** 5 adult sheep.

**Methods:** All sheep underwent 3-piece Le Fort I osteotomies with careful preservation of all descending palatine vessels. They were subjected to measurements of maxillary blood flow utilizing a carefully calibrated laser Doppler flowmeter at 5 intervals through 4 small holes drilled both mesial and distal to the vertical osteotomy bilaterally. A fifth small hole was also drilled in the mandible as a reference measurement point, allowing the calculations to be expressed as a ratio of blood flow within each animal, thus minimizing the effects of anesthesia between subjects. A 12-mm Hyrax device was secured to each animal to allow successive expansions following segmentation. The measurement times were as follows: T1 (prior to osteotomy); T2 (following segmentation); T3 (at expansion of 4 mm); T4 (at expansion of 8 mm); and T5 (at expansion of 12 mm). The measurements were standardized with data collection continuing at each site until a recording of at least 2 minutes of stable values were obtained. The perfusion values of each maxillary segment were calculated as a percentage of the mandibular control in the same animal, and then subjected to analysis of variance, with 95% confidence intervals considered significant.

**Results:** No significant differences were noted between sides or between the premaxilla and lateral segments. Geometric means expressing a ratio of overall maxillary segment perfusion to respective mandibular perfusion showed a highly significant difference between T1 and T2, representing a reduction in perfusion between the uncut maxilla and initial segmentation osteotomies by a factor of 3.10. No differences were found between T2 and T3 or between T4 and T5; however, the difference (factor of 1.81) between T2/T3 and T4/T5 was, again, highly significant. This represented a significant reduction of perfusion in maxillary expansions >4 mm.

**Conclusions:** Maxillary segmentation clearly results in reduced bony vascular perfusion initially, but the perfusion is not appreciably different when the ensuing expansion does not exceed 4 mm. Exceeding this threshold with increased widening of the maxilla then results in a perceived increased risk in avascular necrosis demonstrated by additional reductions in bone blood flow measured by laser Doppler flowmetry.

**Reviewer's Comments:** This well-controlled animal study represents immediate reductions in blood flow following maxillary segmentation via 3-piece Le Fort I osteotomies that worsen as the maxilla is widened beyond 4 mm intraoperatively by the use of a Hyrax device. The measurements in this study were taken very closely in time prior to near immediate sacrifice of the animals and do not represent or consider the immediate nourishment via diffusion and the subsequent revascularization that enhances our success with multisegment orthognathic surgery. (Reviewer-Michael L. Ellis, DDS).

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Keywords: Multisegmental Maxillary Osteotomy, Orthognathic Surgery, Bone Blood Flow

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## Complete Discectomy May Be Most Successful for TMJ Internal Derangement

*Discectomy as the Primary Surgical Option for Internal Derangement of the Temporomandibular Joint.*

Miloro M, Henriksen B:

J Oral Maxillofac Surg 2010; 68 (April): 782-789

Complete discectomy may have a better success record than other open joint procedures in controlling TMJ pain.

**Objective:** To evaluate outcomes of patients who underwent TMJ discectomy without replacement as the first surgical treatment for internal derangement after failed nonsurgical therapy.

**Design:** Retrospective study of the records of patients who underwent discectomy as the first surgical procedure for symptoms of internal derangement of the TMJ after failure of nonsurgical management.

**Participants/Methods:** The records of 24 patients with 32 operated joints were reviewed for the study. All patients had undergone complete discectomy as the first surgical procedure for the symptoms of internal derangement of the TMJ that had been refractory to nonsurgical management. The average follow-up time was 30 months (range, 2 to 60 months). Outcomes were measured by using the standardized Helkimo Anamnestic and Clinical Dysfunction Indexes. These indexes were objective and subjective measures of postoperative function and symptoms as compared to the same measurements preoperatively.

**Results:** All patients showed improvement in mandibular mobility and function, and all had a reduction of joint and muscular pain. When asked, all patients said they would undergo the procedure again if it was required.

**Conclusions:** Discectomy was a successful procedure in reducing pain and improving function in all patients who were entered into this study.

**Reviewer's Comments:** The data in this study show that, for this limited number of patients (some with a very short follow-up), complete discectomy was successful in improving pain and function in joints that had resisted nonsurgical treatment. (Reviewer-Edwin D. Joy, Jr, DDS).

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Keywords: TMJ, Internal Derangement, Discectomy

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## It Takes More Than a Panorex

### *The Prognostic Value of Panoramic Radiography of Inferior Alveolar Nerve Damage After Mandibular Third Molar Removal: Retrospective Study of 400 Cases.*

Szalma J, Lempel E, et al:

Oral Surg Oral Med Oral Path Oral Radiol Endod 2010; 109 (February): 294-302

Panoramic radiographs are not an adequate screening method to determine if radiographic signs predicting paresthesia after third molar removal are accurate.

**Objective:** To evaluate the ability of panoramic radiographic signs to help predict inferior alveolar nerve (IAN) paresthesia following removal of mandibular third molars.

**Design:** Case-control study.

**Participants:** 400 patients having removal of impacted mandibular third molars.

**Methods:** All patients had conventional panoramic radiographs as part of their evaluation for third molar removal. The predictive variables radiographically identified for potential nerve disturbance were interruption of the superior cortical line of the mandibular canal wall, diversion of the canal, narrowing of the canal, and darkening of the tooth root. Other variables were also considered, including impaction grade classification, patient age, and root curvature. The outcome variable was the presence or absence of IAN paresthesia after third molar removal. Examination of the nerve function was done 1 week after surgery objectively with light touch, direction sense, pin-prick, and 2-point discrimination. All surgeries were done with similar techniques using local anesthesia. When the nerve was visualized, an iodoform impregnated drain was placed to avoid possible nerve compression.

**Results:** 39 patients had neurosensory disturbances 1 week after surgery, while the 359 control subjects did not. The patient's mean age was 30 years. Two of the 41 instances of nerve disturbance were bilateral. Of the 39 patients who had nerve paresthesia, 31 were female. Control subjects had a mean age of 28.4 years, and just 130 of the 359 were female. In all, 61% of the surgeries were performed on women. Statistically, patients with IAN injury were likely to be older and to be female. The frequencies of nerve disturbance from the signs evaluated radiographically were 14% when the superior canal cortical line was interrupted, 5.8% with canal diversion, 5.5% when the canal appeared narrowed, and 12.3% when the root was darkened. When  $\geq 2$  of these signs were seen together, the incidence of nerve disturbance was 15.3%.

**Conclusions:** The most reliable indicator for avoiding nerve paresthesia during third molar removal was the absence of the signs evaluated in this study. The presence of  $\geq 1$  of these signs is a potential, but not a reliable, indicator of possible paresthesia. The strongest indicator, in this study, of possible nerve disturbance was darkening of the root, while interruption of the superior cortical line and canal diversion were weak indicators. The bottom line is that panoramic radiographs are not satisfactory for predicting IAN disturbance after third molar surgery.

**Reviewer's Comments:** So what are the indicators for ordering a cone-beam CT scan or another more sophisticated study, and how accurately can they predict a problem? Or, do we do a coronectomy? Lastly, how do we advise our patients? The clinical scenario and our informed consent process are ultimately what we have to rely upon. (Reviewer-Sterling R. Schow, DMD).

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Keywords: Third Molar Removal, Inferior Alveolar Nerve Damage, Panoramic Radiography

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## Review of Mandibular Biomechanics Related to Reconstruction

*Biomechanics of Mandibular Reconstruction: A Review.*

Wong RCW, Tideman H, et al:

Int J Oral Maxillofac Surg 2010; 39 (April): 313-319

Forces on reconstructed mandibles are not well understood, and there exists no ideal method to assure success over the long term.

**Objective:** To review mandibular biomechanics and published methodologies of mandibular reconstruction.

**Design:** Literature-based review. **Materials:** Multiple bioengineering, human, and animal experimental articles were identified to provide a review of biomechanics, with emphasis on factors related to mandibular reconstruction.

**Methods:** Mandibular biomechanics are described to set the stage for reconstructive considerations in the second part of the paper. Biomechanics vocabulary logically precedes discussions of stresses involved in mandibular deformation secondary to trauma and pathology and subsequent reconstructions. Bone loading forces including tension/compression, shear, torsion, and bending, either physiologic or pathologic, are reviewed. The geometry and function of the mandible, along with stress-strain relationships, yield strengths resulting in permanent deformation, elastic limits, ultimate (breaking) strength, and other physical and material properties related to bone and its macrostructure are described. Multiple methods used to study mandibular stress distribution, from finite element analysis to photoelastic modeling and strain gauge analyses, are reviewed, noting that all methods have limitations secondary to structure, supportive muscle function, and dynamic moment arms dependent on occlusal load or external force application. Force considerations are highlighted by a review of deformation of specific areas of the mandible, focusing on lines of shear and compressive forces resulting in sagittal bending expressed as tension at the inferior border and compression at the superior border. These forces, described by Champy as ideal lines for internal fixation, have changed the way we think about and provide surgical care for angle fractures, reducing the need for larger bone plates in many instances.

**Results:** A review of functional biomechanics is followed by a review of mandibular reconstruction with free, pedicled, particulate or tissue-engineered grafts. The reduction in bite forces following mandibular reconstruction is noted to be reduced as much as 76%. Bone plates with locking screws reduce screw loosening and allow the reconstruction to function as a hybrid unit with qualities of both internal and external fixation. With regard to vascularized flaps, some have concluded that the fibula best replaces the material properties of the mandible, while others conclude that iliac crest is superior. Engineered bone marrow stroma and resorbable scaffolds continue to be studied, along with bone morphogenetic proteins and orthopedic designed endoprosthetics with bone cements.

**Conclusions:** Many models have been described in an attempt to reduce the morbidities associated with mandibular reconstruction. Consideration of basic biomechanics is imperative as more predictable methods are sought to achieve excellence in mandibular functional reconstructions.

**Reviewer's Comments:** The authors provide a comprehensive review of the mandibular reconstruction literature, coupled with the general biomechanical principles of stress in a complex system. Locking plate and screw systems allow surgical latitude and reduce plate stresses brought on by overbending; however, tissue-engineered bone and biologic scaffolds will likely yield greater reconstructive success in the future. (Reviewer-Michael L. Ellis, DDS).

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Keywords: Biomechanics, Strength, Mandible, Reconstruction

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## BRONJ -- Late Complication in Patients With Dental Implants

*Bisphosphonate-Related Osteonecrosis of the Jaw Associated With Dental Implants.*

Lazarovici TS, Yahalom R, et al:

J Oral Maxillofac Surg 2010; 68 (April): 790-796

In patients with dental implants, BRONJ seems to occur as a late complication rather than immediately after surgery.

**Objective:** To present a large series of patients with dental implants who have bisphosphonate-related osteonecrosis of the jaw (BRONJ) following intravenous or oral bisphosphonate therapy.

**Design:** Retrospective study of patients with the diagnosis of BRONJ who had dental implants placed.

**Participants/Methods:** 145 patients diagnosed with BRONJ were followed. Of these, 27 developed the disease associated with dental implants. Their management and outcomes of treatment were described in the study. The results of the management were described.

**Results:** Of the 27 patients who developed BRONJ associated with dental implants, all were treated with oral antibiotics over a long period (up to 1 year). The time between placement of the implants and the development of BRONJ was recorded. Classification of surgically related BRONJ was given for those in whom the disease developed within 6 months of placement of the implants; classification of nonsurgically related was disease that developed after 6 months. Most of the disease occurred after 6 months; therefore, the majority was classified as nonsurgically related. Sixteen of the patients (59%) had their implants removed as a result of the disease. The vast majority of patients had resolution of the BRONJ with long-term antibiotic therapy and/or removal of the implants.

**Conclusions:** BRONJ occurs as a late complication of the insertion of dental implants rather than related to the surgery. Since BRONJ is a late complication rather than the result of surgery, patients who receive dental implants should be followed for long periods following insertion.

**Reviewer's Comments:** This study shows that in patients with dental implants who are on oral or IV bisphosphonates, follow-up should probably be lifetime. (Reviewer-Edwin D. Joy, Jr, DDS).

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Keywords: Dental Implants, Bisphosphonate, Osteonecrosis of the Jaw

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### 3-D Analysis Can Be Useful for Evaluating OSA

*Comparison of Cone-Beam CT Parameters and Sleep Questionnaires in Sleep Apnea Patients and Control Subjects.*

Enciso R, Nguyen M, et al:

Oral Surg Oral Med Oral Path Oral Radiol Endod 2010; 109 (February): 285-293

The presence and severity of OSA is associated with a narrow lateral dimension of the airway, increasing age, male gender, and high-risk Berlin questionnaire.

**Objective:** To study cone-beam CT (CBCT) scans of patients with obstructive sleep apnea (OSA) and snorers in order to develop a prediction model for OSA based on CBCT imaging.

**Design:** Prospective case-control study.

**Participants:** 80 patients--34 snorers and 46 OSA patients.

**Methods:** All 80 subjects were recruited through mail and flyers from patients, faculty, and staff at the University of Southern California School of Dentistry. All the subjects had a 2-night baseline ambulatory sleep study. The snoring patients, who served as controls, all had an apnea-hypopnea index (AHI) <10 events per hour. The OSA patients all had an AHI >10 events per hour. Each subject had a CBCT scan done while in a supine position. All subjects also answered the Berlin questionnaire, which has 3 categories of questions relating to sleep and snoring patterns, daytime sleepiness, and related symptoms. Using the CBCT scans, DICOM images were used to define volumetric regions of interest in the oropharyngeal airway. When the axial slice in the oropharyngeal airway was located that had the smallest computed cross-sectional area, its anteroposterior (AP) and lateral dimensions were measured.

**Results:** The snorers and OSA subjects were different in mean age, body mass index, and neck circumference. OSA subjects were heavier, older, and had bigger necks. Forty-two of the 46 OSA subjects were males as were about two thirds of the snorers. Snorers were 7 years younger than the OSA subjects and had a mean neck circumference 1.6 inches narrower. There was no significant difference in groups as to race or ethnicity. There were no significant differences between snorers and OSA patients in median airway AP dimension, airway length, vertical soft palate or horizontal palate length, or total airway volume. Subjects with OSA generally had a slightly more spherical airway shape than snorers and a narrower lateral airway dimension. The Berlin questionnaire sensitivity, specificity, and positive and negative predictive values against ambulatory somnographic data were 67.4%, 52.9%, 66.0%, and 54.5%, respectively, in OSA screening.

**Conclusions:** Males are 28 times more likely to have OSA than females, people aged >57 years are 7.5 times more likely than younger individuals to have OSA, and the Berlin questionnaire "high-risk" responders are 5.8 times more likely to have OSA. Finally, subjects with an upper lateral airway dimension that is small (<17 mm) are 3.9 times more likely to have OSA.

**Reviewer's Comments:** This all makes sense--I think. There are lots of numbers, tables, and illustrations, which were interesting to put together. The conclusions are not a surprise. (Reviewer-Sterling R. Schow, DMD).

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Keywords: Systemic Disorders, Cone Beam CT, Obstructive Sleep Apnea

Print Tag: Refer to original journal article



## Data Sparse on Long-Term Success With Locking Systems

*Scope and Limitations of Methods of Mandibular Reconstruction: A Long-Term Follow-Up.*

Maurer P, Eckert AW, et al:

Br J Oral Maxillofac Surg 2010; 48 (March): 100-104

Mandibular reconstruction plates do not fare well in the irradiated field, and often must be explanted secondary to intraoral and extraoral dehiscences and exposures.

**Objective:** To review stability and complications of immediate mandibular reconstruction with conventional reconstruction plates, and to correlate treatment with findings therein.

**Design:** Retrospective records review.

**Participants:** 102 consecutive resection patients were included: 73 men and 29 women with a mean age of 55 years and mean follow-up of 66 months.

**Methods:** A records review determined health and habits, age and diagnosis, surgical treatment and extent of the resection, treatment and hospital course, adjuvant therapies, complications, and follow-up. The data were subjected to the Statistical Package for the Social Sciences to identify influences of treatment upon the reconstruction plate and outcomes. Risk factors were subjected to log-rank tests and *P* values <0.05 were significant. Regression analysis clarified effects of multiple variables on results. Defects were categorized by the standard international HCL system, with H including the area from the symphysis up to and including the condyle, C representing the central mandible between the canines, and L describing the lateral mandible from the canine area to the base of the articular process excluding the condyle. Reconstructions were either solely with reconstruction plates with or without a condylar element, or included only free bone grafts secured with 2.0-mm mini-plates. Overall, 52% of defects were class L. Following contouring of the plate prior to resection, standard titanium reconstruction plates were secured with three 2.7-mm bicortical nonlocking screws on each side of a defect in 73 patients. Twenty-six iliac crests and 4 fibula grafts were provided in 30 of 102 patients. Four patients received a condyle prosthesis fixed to the residual mandible.

**Results:** The overall success rate of these reconstructions was 64%. Defects spanned by a reconstruction plate achieved a 63% success, and those defects addressed with miniplate-bone reconstruction enjoyed a 66% success rate. Forty patients underwent premature explantation of the reconstruction plate. Five were due to screw loosening, 5 were due to plate fractures, and 27 because of intraoral or extraoral dehiscence and plate exposure. Eighteen of 27 plate exposures had radiotherapy, resulting in a statistically significant lower success rate in this category, though notably it was not dose dependent. Size of the tumor or defect represented as scored by the HCL classification showed no influence on success or failure. Smoking, alcohol, and age statistically increased failure rates.

**Conclusions:** Alloplastic reconstruction results in a 37% complication rate, consistent with previous reports. Those with a poor prognosis, or who are awaiting clear margins and tissue maturation for an intended secondary reconstruction, certainly benefit from immediate alloplastic reconstruction.

**Reviewer's Comments:** This paper provides many of the same conclusions of other previously published studies. This study looks only at alloplastic reconstruction with nonlocking plates and screws, and acknowledges that the data are yet sparse to comment on long-term successes with locking systems. (Reviewer-Michael L. Ellis, DDS).

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Keywords: Mandibular Reconstruction, Alloplastic Reconstruction, Devices, Complication

Print Tag: Refer to original journal article

## Osteonecrosis of Jaws Can Be Caused by Drugs That Inhibit Osteoclasts

*Osteonecrosis of the Jaw in a Patient on Denosumab.*

Aghaloo T, Felsenfeld AL, Tetradis S:

J Oral Maxillofac Surg 2010; 68 (May): 959-963

Osteonecrosis of the jaw may be associated with other drugs than bisphosphonates. Any drug that inhibits the normal function of osteoclasts may be related to this condition.

**Objective:** To present a case of osteonecrosis of the jaws caused by denosumab, an inhibitor of osteoclast activity.

**Design:** Case report study of a patient with multiple medical problems presenting with osteonecrosis of the jaw caused by a drug other than a bisphosphonate.

**Participants/Methods:** One patient with osteonecrosis of the jaw is presented with symptoms and medical history. Possible pathophysiology of osteonecrosis related to osteoclast activity is presented.

**Results:** A 65-year-old patient with multiple medical problems on multiple medications but not on a bisphosphonate drug presented with osteonecrosis of the jaws for >8 weeks duration. Before the disease resolved, the patient died from other medical causes.

**Conclusions:** Osteonecrosis of the jaw may be associated with other drugs than bisphosphonates. Any drug that inhibits the normal function of osteoclasts may be related to this condition.

**Reviewer's Comments:** This is an interesting study and the first published case of osteonecrosis of the jaws related to a drug other than a bisphosphonate. (Reviewer-Edwin D. Joy, Jr, DDS).

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Keywords: Osteonecrosis, Denosumab

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## Sporadic and NBCCS KCOTs May Behave Similarly in Aggressiveness

*Keratocystic Odontogenic Tumor Associated With Nevroid Basal Cell Carcinoma Syndrome: Similar Behavior To Sporadic Type?*

Figueroa A, Correnti M, et al:

Otolaryngol Head Neck Surg 2010; 142 (February): 179-183

There is no evidence to indicate that KCOTs in NBCC are more aggressive and infiltrative than sporadic KCOT lesions, therefore, surgical plans should not be influenced by the fact that a KCOT is a sporadic or NBCCS-associated lesion.

**Objective:** To analyze and compare the expression of proliferative markers and p53 in keratocystic odontogenic tumor (KCOT) sporadic type and KCOT associated with nevoid basal cell carcinoma syndrome (NBCCS).

**Design:** Cross-sectional comparative study.

**Participants:** 19 patients with KCOT--12 with sporadic lesions and 7 with KCOT associated with NBCCS.

**Methods:** 5- $\mu$ m thick sections from lesions in all 19 patients were used to complete immunohistochemical analysis for monoclonal antibodies for proliferation cell nuclear antigen (PCNA), Ki-67 protein, and p53 protein. The intent was to determine whether the presence or distribution of these factors made a difference in the degree of aggressiveness of the KCOT lesions, sporadic, or NBCCS associated.

**Results:** 86% of NBCCS and 75% of sporadic KCOTs were positive for PCNA. When analyzing for p53 expression, 42% of sporadic KCOTs and just 14% of NBCCS KCOTs were positive. Expression of Ki-67 was weakly positive in 1 NBCCS-associated KCOT and in none of the sporadic lesions. In both types of lesions, strong expression for PCNA was observed in the odontogenic epithelium in the basal and spinous layers. Evaluations of a potential association between the PCNA and Ki-67 markers, as well as Ki-67 and p53, showed no association. Finally, immunopositivity of PCNA and p53 markers did not show much variation between sporadic and syndromic KCOT lesions.

**Conclusions:** The most often expressed marker in both sporadic and syndrome-associated KCOT lesions was PCNA followed by p53. Since there was no correlation between the expressions of p53 and PCNA and the type of KCOT, this suggests these lesions may behave similarly in terms of aggressiveness. Surgical plans should not be influenced by the fact that a KCOT is a sporadic or NBCCS-associated lesion.

**Reviewer's Comments:** I was pleased to see this paper because I've always wondered if there was a difference in how these lesions behaved. If there is, based on this study, it's not because of significant differences in expression of PCNA, p53, or Ki-67. (Reviewer-Sterling R. Schow, DMD).

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Keywords: Pathology & Immunology

Print Tag: Refer to original journal article

## When Planning a Rhinoplasty, Look at the Chin as Well

*Assessment of the Chin in Patients Undergoing Rhinoplasty: What Proportion May Benefit From Chin Augmentation?*

Ahmed J, Patil S, Jayaraj S:

Otolaryngol Head Neck Surg 2010; 142 (February): 164-168

Female rhinoplasty patients, more often than males, would be likely to benefit from chin augmentation procedures as well.

**Objective:** To determine the incidence of microgenia in a group of patients being seen for rhinoplasty.

**Design:** Preoperative photograph evaluation.

**Participants:** Photographs of 94 patients who had undergone rhinoplasty in the authors' institution.

**Methods:** To include the patients' photos in the study, they had to have been taken with the patient in repose with clearly visible and calculable esthetic dimensions. Four frequently used methods of chin analysis, all of which analyze the chin in a horizontal plane, were applied to the images. These methods were described by Silver, Gonzales-Ulloa, Legan, and Burnstone, and finally by Merrifield. Each method is briefly explained in the text. The digital photographs were independently analyzed by 2 experienced surgeons and the values indicating microgenia were taken as positive when both evaluators agreed.

**Results:** 58 males and 36 female patients had photographs available for evaluation; 6 of these were not suitable for analysis. For many of the rhinoplasty patients, the different methods of analysis indicated that they would also benefit from chin augmentation. Depending on the method, 17% to 62% of male patients and 42% to 81% of female rhinoplasty patients had apparent horizontal microgenia. Using the Gonzales-Ulloa and Merrifield analyses, females had statistically significant microgenia as a group compared to males. There was also a trend in favor of more females with microgenia using the Legan, Burnstone, and Silver analyses, but this trend did not reach significance.

**Conclusions:** Significant numbers of patients seeking rhinoplasty might also benefit from chin augmentation. When evaluating patients for rhinoplasty, the chin should also be addressed.

**Reviewer's Comments:** The authors recommend using >1 method to evaluate and plan surgery for the deficient chin. In contrast to many "other specialty" surgeons that address only the most obvious deformity, the authors emphasize the malocclusions and facial relationships. (Reviewer-Sterling R. Schow, DMD).

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Keywords: Orthognathic Surgery, Microgenia, Rhinoplasty

Print Tag: Refer to original journal article

## Antibiotic Selection for Acute Sinusitis--Azithromycin or Amoxicillin/Clavulanate?

*Azithromycin Extended Release Vs Amoxicillin/Clavulanate: Symptom Resolution in Acute Sinusitis.*

Marple BF, Roberts CS, et al:

Am J Otolaryngol 2010; 31 (January-February): 1-8

After 5 days of treatment, more patients with acute bacterial sinusitis treated with extended release azithromycin had symptom resolution than patients treated with amoxicillin/clavulanate.

**Objective:** To compare the effectiveness of treating acute sinusitis with a single 2-g dose of azithromycin extended release or a 10-day course of amoxicillin/clavulanate.

**Design:** Prospective randomized open-label observational study in patients with acute bacterial sinusitis of between 7 and 30 days duration.

**Participants:** 378 patients who received a single 2-g extended release dose of azithromycin and 371 patients who received 10 days of amoxicillin/clavulanate 875 mg/125 mg every 12 hours for acute sinusitis.

**Methods:** All subjects had signs or symptoms of acute maxillary sinusitis of 7 to 30 days duration including pain, pressure, tightness, and congestion that became worse with percussion, movement, and positional change. Other symptoms included purulent nasal drainage, fever, coughing, and postnasal drainage. Patients were randomly assigned to 1 of the 2 treatment groups and maintained a diary with twice-daily entries to record symptom presence and severity and side-effects such as diarrhea, abdominal discomfort, treatment compliance, and use of additional medications. The patients were interviewed 12 and 28 days after starting treatment. The primary end point was self-reported resolution of symptoms at day 5. Patients were asked about time to symptom resolution, sinus-related quality of life, need for additional visits, and success or failure of treatment.

**Results:** There were no significant demographic differences between the 2 groups of patients. In total, 29.7% of patients treated with single-dose azithromycin compared to just 18.9% of those treated with amoxicillin/clavulanate had symptom resolution by day 5. By the end of the 28-day period, the symptom resolution percentages were 67.4% and 63.0% for the azithromycin and amoxicillin/clavulanate groups, respectively. In both groups, about 11% of patients needed an additional antibiotic prescription. Adverse events during treatment were about equal in both groups and none were serious--the most common being abdominal discomfort, which was more common in the azithromycin group on the first day after dosing. Relapse rates were not different in 28-day outcome evaluations between both groups.

**Conclusions:** Single-dose extended release azithromycin was more effective in providing early symptom relief in acute sinusitis patients than amoxicillin/clavulanate.

**Reviewer's Comments:** Other studies have questioned the value of antibiotic treatment for acute sinusitis if symptoms are treated and drainage improved. It's too bad this study didn't have a third group of patients included to make this comparison. (Reviewer-Sterling R. Schow, DMD).

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Keywords: Acute Sinusitis, Treatment, Symptom Resolution

Print Tag: Refer to original journal article

## Medpor Implants Provide Satisfactory Genioplasty Results

*Comparison of Genioplasty Using Medpor and Osteotomy.*

Park JY, Kim SG, et al:

Oral Surg Oral Med Oral Path Oral Radiol Endod 2010; 109 (February): e26-e30

The amount of anterior movement achieved using Medpor chin implants is more stable than with genioplasty by osteotomy 6 months after surgery.

**Objective:** To compare treatment results when doing osteotomy or Medpor implant genioplasties measuring anteroposterior change in both soft and hard tissues.

**Design:** Retrospective comparative study.

**Participants:** 33 patients having chin augmentations.

**Methods:** There were 2 groups of patients included in the study--14 who had an osteotomy genioplasty and 19 whose genioplasty was done with a Medpor implant. Patients were allowed to choose which procedure they wanted to be done. Patients in both groups may also have had sagittal ramus and Le Fort osteotomies. The incision used for the genioplasty was the same for both osteotomies and implants. Fixation of the osteotomized genioplasty was accomplished with miniplates and screws. Medpor implants were stabilized with miniscrews. All patients were followed a minimum of 6 months following their surgery. Lateral cephalometric films were taken before surgery, within a week after surgery, and 6 months later. Changes in hard and soft tissues in an anteroposterior direction were noted as was the amount of relapse.

**Results:** Patients having an osteotomy genioplasty had an average 4.49 mm advancement compared to 7.05 mm advancement with the Medpor implants. When an osteotomy was done, the mean advancement was initially 5.08 mm, which relapsed 0.71 mm over 6 months. With the osteotomy, the mean soft tissue advancement at pogonion was 4.89 mm and the mean relapse after 6 months was 0.81 mm (18.59%). When the Medpor implant was used, the mean relapse at soft tissue pogonion was 14.56%. Mean soft tissue thickness before surgery at pogonion was 13.29 mm before osteotomy and 13.02 mm before placing the implant. This tissue thinned to 13.11 mm and 12.94 mm after osteotomy or implant placement, respectively. After using an implant, there seemed to be a bit less soft tissue relapse than when an osteotomy was done.

**Conclusions:** When proper evaluation is done and when used appropriately, Medpor implants can provide satisfactory genioplasty results.

**Reviewer's Comments:** Studies have shown that Medpor must be carefully handled to avoid infection. The authors soaked it in antibiotic solutions before implanting. Unfortunately, the authors did not address hard- or soft-tissue vertical changes in this study--only horizontal changes. (Reviewer-Sterling R. Schow, DMD).

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Keywords: Orthognathic Surgery

Print Tag: Refer to original journal article

## More About Lateralization of the Inferior Alveolar Nerve

*The Use of Piezosurgery to Mobilize the Mandibular Alveolar Nerve Followed Immediately by Implant Insertion: A Case Series Evaluating Neurosensory Disturbance.*

Bovi M, Manni A, et al:

Int J Periodontics Restorative Dent 2010; 30 (February): 73-81

Using piezosurgery to lateralize the inferior alveolar nerve for implant placement can improve the ability to avoid significant neurosensory disturbances.

**Objective:** To evaluate inferior alveolar neurosensory disturbance after nerve lateralization using piezosurgery.

**Design/Participants:** Clinical case series involving 9 patients.

**Methods:** 10 inferior nerve lateralization procedures were completed on the 9 patients to increase the vertical available bone for implant placement. Before the procedure, CT scans revealed a mean of 6.4-mm residual alveolar process between the ridge crest and the mandibular canal. Nerve lateralization was accomplished using a piezosurgery device. The procedure is nicely described and illustrated in the paper. Twenty implants were placed in the areas of nerve lateralization in a 2-stage procedure. Second-stage surgery and prosthetic loading were done 4 months later. Patients were observed weekly after surgery until function return of the inferior alveolar nerve and then 1, 2, 3, 6, 12, 24, and 36 months later. The same surgeon did all the procedures and follow-ups. Neurosensory tests at each visit included a light touch test, a pain test, and a 2-point discrimination test. The control area for comparison during testing was the opposite nerve or, in bilateral procedures, the upper lip.

**Results:** All of the patients had at least some degree of diminished neurosensory function. By 2 weeks after surgery, the function of the nerve was judged to be fully restored in 8 of the 10 areas. The other 2 sites were considered to have full function after 8 weeks and 3 months, respectively. None of the implants failed, and all patients were successfully restored.

**Conclusions:** Inferior alveolar nerve lateralization with piezoelectric surgery appears to be a successful way to increase bone volume for implant placement with minimal neurosensory disturbance.

**Reviewer's Comments:** The paper provides a detailed description of the surgical technique employed in this clinical evaluation as well as of the neurosensory testing methods. It is a short, interesting read, particularly for those who use or are considering acquiring a piezoelectric device. (Reviewer-Sterling R. Schow, DMD).

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Keywords: Implants, Piezosurgery, Neurosensory Disturbance

Print Tag: Refer to original journal article

## A Close Look at 126 Patients With 201 Mandible Fractures

*A Retrospective Study of Mandibular Fracture in a 40-Month Period.*

de Matos FP, Arnez MFM, et al:

Int J Oral Maxillofac Surg 2010; 39 (January): 10-15

Fracture patterns and complications of treatment are largely predictable in an urban population, and an early trip to the operating room increases patient comfort.

**Objective:** To identify and evaluate the epidemiology, treatment, hospital course, and complications of patients identified with facial trauma that included mandible fracture.

**Design:** Retrospective chart and radiologic review.

**Participants:** 126 patients (100 males, 26 females) with 201 mandibular fractures.

**Methods:** 700 facial trauma files were reviewed, identifying 126 patients with mandibular fracture with or without other facial injury. Data collection on the population consisted of normal epidemiological considerations including but not limited to fracture patterns and treatments. Preoperative and postoperative radiographs were obtained. A single oral and maxillofacial surgeon used rigid internal fixation (RIF) and no postoperative maxillomandibular fixation. Multiple size plating systems were used, with minimized surgeon's preference for specific systems. Standard postoperative follow-up visits were utilized, that is, weekly for 1 month and then monthly.

**Results:** Fractures were predominantly found in males on the order of 4:1 over females. In this Brazilian study, 80% were Caucasian, 24% were mixed race, and 6% were Afro-Brazilian. Most subjects were in their third decade. Forty percent of patients were treated the same day, and 60% were treated an average of 3.8 days after their injury. Patients were discharged approximately 1.1 days after surgery. Forty-eight percent of patients had social risk factors including smoking, alcohol, IV drug abuse, non-IV drug abuse, and mixtures thereof. Ninety-one percent of patients reported pain, 78% reported malocclusion, and 25% had neurosensory deficits. Signs of fracture included facial swelling (78%), decreased mandibular motion (55%), and malocclusion (48%). The usual etiologies were accidents involving cars, motorcycles, and bikes. Eighty percent of the car accident victims were wearing seat belts, and all motorcyclists were wearing helmets. Fracture patterns included condyle (28%), body (25%), symphysis (22%), angle (18%), ramus (4%), and coronoid (2%); 109 patients were treated surgically via various approaches, and 17 were treated with soft diet and physiotherapy. Of the 284 plates utilized, 252 were 2.0-mm systems. Two plates were used in most fractures: a monocortical plate in the tension zone, and a bicortical plate in the compression zone. Antibiotic use was consistent only in the intraoperative period. Neurosensory disturbance (23%) and infection (8%) were the most common complications. Eight percent of patients failed follow-up examination in this study.

**Conclusions:** Traffic accidents, violence, and falls resulted in predictable fracture patterns and epidemiologic distributions of data. RIF is an excellent technique, providing early functional return and patient comfort. No difference in early versus late treatment was noted in this population.

**Reviewer's Comments:** Early application of a bridal wire, defined as a wire dental splint, provides patient comfort until such time that definitive care may take place. Perioperative antibiotics for fracture patients is likely sufficient in the absence of overt facial lacerations, gross contamination, or lengthy delay to the operating room. (Reviewer-Michael L. Ellis, DDS).

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Keywords: Facial Trauma, Mandibular Fracture, Epidemiology, Treatment

Print Tag: Refer to original journal article



### 3-D Inlay, Onlay Grafting of Posterior Maxillary Defects

*Inlay–Onlay Grafting for Three-Dimensional Reconstruction of the Posterior Atrophic Maxilla With Mandibular Bone.*

Cordaro L, Torsello F, et al:

Int J Oral Maxillofac Surg 2010; 39 (April): 350-357

Sufficient periosteal releasing incisions are essential to ensure complete coverage and tension-free closure over bone-grafted sites.

**Objective:** To examine surgical and prosthetic results obtained when 3D reconstruction of posterior partially edentulous maxillary defects is utilized to address horizontal and vertical volume deficits in the face of a pneumatized maxillary sinus.

**Design:** Prospective study of 86 consecutively enrolled patients requiring reconstruction of posterior maxillary volume deficits to enable implant placement and dental rehabilitation.

**Participants:** 12 female and 4 male patients with a mean age of 51 years were included (19% of those considered). Patients requiring combination sinus grafting, along with horizontal and vertical augmentation from an intraoral source, were considered for inclusion. Active periodontal disease, smoking >10 cigarettes per day, minor bony volume deficits, or general poor health resulted in participant non-inclusion.

**Methods:** Photographs, panoramic intraoral radiographs, and CT scans were obtained on all patients for diagnostic purposes. All included participants required sinus augmentation as demonstrated on the diagnostic images. This was accomplished with milled bone processed after block mandibular harvest from the external oblique ridge or chin, and sometimes mixed with anorganic bovine particulate allograft (ABB) when necessary to expand sinus volume or contour block edges. Other blocks obtained were utilized to reconstruct vertical (>12 mm from edentulous ridge to occlusal plane) and horizontal deficits (<4 mm width). The harvested blocks were fixated with 1.5-mm lag screws. Resorbable collagen membranes were used to cover all ABB conjunctive graft sites. Careful intraoperative direct bone measurements were recorded at initial and post-augmentation sites, as well as at surgery immediately before implant placement 4 months after the initial grafting. Antibiotic coverage, antimicrobial rinses, pain medications, and close follow-up were standardized. The implants were loaded at 12 weeks, and were considered successful at 1 year if devoid of pain, suppuration, mobility, or resorption >1.5 mm. Wilcoxon tests were considered significant at  $P < 0.05$ .

**Results:** Mean horizontal augmentation was 5.5 mm, and this resorbed to 4.3 mm (22% loss of width). Mean vertical augmentation was 3.2 mm, and this resorbed to 2.1 mm (34% loss of height). All maxillary vertical onlay augmentation, when coupled with the sinus inlay augmentation, allowed placement of maxillary implant of at least 10 mm in height. All horizontal augmentations allowed placement of implants either 4.1 or 4.8 mm in diameter. These resultant gains in width and height enabling successful implant placement and restorations were statistically significant. No grafts were lost, and 49 implants were successful.

**Conclusions:** 3D reconstruction of posterior maxillary defects by completing simultaneous onlay and inlay grafting can indeed be successful.

**Reviewer's Comments:** Interestingly, the amount of vertical augmentation of the sinus was not measured. Vertical augmentation is a more difficult venture and is less predictable, and this is well known. The small sample size may have contributed to the 100% grafting, implant, and prosthodontic success. (Reviewer-Michael L. Ellis, DDS).

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Keywords: Bone Graft, Atrophic Maxilla, Sinus Floor Elevation

Print Tag: Refer to original journal article

## Considerations for Implant Retention of Nasal Prostheses

*Implant-Retained Nasal Prosthesis for Reconstruction of Large Rhinectomy Defects: The Salisbury Experience.*

Ethunandan M, Downie I:

Int J Oral Maxillofac Surg 2010; 39 (April): 343-349

Careful modification of the pyriform rim, coupled with anterior nasal septum and inferior turbinate reduction prior to skin grafting, is the key to success when restoring a rhinectomy defect with an implant-retained prosthesis.

**Objective:** To review key treatment concepts enhancing the success of rhinectomy treatments involving full-thickness defects and implant-supported prostheses.

**Design:** Retrospective analysis of rhinectomy treatments with descriptive statistics.

**Participants:** 34 rhinectomy patients reconstructed with implant-supported prostheses following full-thickness excision of basal cell carcinomas (16), squamous cell carcinomas (15), or salivary tumors (3).

**Methods:** Possible demographic factors influencing success were acquired and analyzed with Fisher's exact test (considered significant at  $P < 0.05$ ), including smoking, defined pathology, extent of excision, radiotherapy, hyperbaric oxygen therapy (HBO), implant length and location, single or staged procedures, method of prosthesis retention, and success rates of implants and/or prostheses. Techniques were also standardized for success, and comments regarding methods to enhance success were offered by the authors.

**Results:** 111 implants were placed in 34 patients after rhinectomy to offer stability to a nasal prosthesis. Implant success was unaffected by histology, sex, or age of the patient. Implants in smokers (13%) failed more frequently than in non-smokers (7%). Pre-implant radiotherapy had a higher incidence of implant failure than post-implant radiotherapy. Those with radiotherapy primarily received HBO, with a similar frequency of failure of implants whether the radiation was received before or after implant placement. Short implants failed more frequently than longer implants. Implants in the orbital rim and maxilla fared worse than those placed in the floor of nose, glabella, or zygoma. Overall implant success was 89% (99 of 111). Seventy-one implants placed in the nose resulted in 5 failures; all failures were in those who received pre-implant placement radiation. Two-stage procedures and implants restored with bars failed more frequently than one-stage procedures and implants restored with magnets.

**Conclusions:** Simplified surgery and magnet retention with one-stage implants of sufficient length placed in the nasal floor, with a skin-graft optimized non-irradiated bed in a non-smoker, enhances the success of implants utilized to support a nasal prosthesis after full-thickness rhinectomy. Anterior nasal septum reduction and inferior turbinoplasty, and skin grafting the nasal defect, allows adequate access for implant placement, prosthesis stability, and hygienic maintenance for the implants and prosthesis.

**Reviewer's Comments:** Although retrospective and descriptive, this is an excellent review of a minimally reviewed topic in our literature. The authors' description of specific surgical attention to pyriform rim reduction and follow-on skin grafting is imperative to allow access for bicortical implant placement in prosthetically convenient positions. This technique provides a stable and hygienic implant base for a nasal prosthesis. (Reviewer-Michael L. Ellis, DDS).

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Keywords: Rhinectomy, Nasal Reconstruction, Nasal Prosthesis, Osseointegration, Craniofacial Implants, Radiotherapy

Print Tag: Refer to original journal article

## Is Mandibular Advancement as Stable for Younger Patients as for Adults?

*Long-Term Stability of Adolescent Versus Adult Surgery for Treatment of Mandibular Deficiency.*

Proffit WR, Phillips C, Turvey TA:

Int J Oral Maxillofac Surg 2010; 39 (April): 327-332

Be sure to consider long-term postoperative changes during the informed consent process, particularly in patients nearing the end of adolescence.

**Objective:** To evaluate changes at 1 and 5 years after mandibular advancement in adolescents who recently completed growth compared to adults, and to evaluate quality of life and satisfaction issues of each patient base.

**Design:** Retrospective radiographic and clinical record review.

**Participants:** 2 groups of patients were evaluated: 32 younger patients (females aged  $\leq 16$  years, and males aged  $\leq 18$  years) versus 52 adult patients (females aged  $\geq 17$  years, and males aged  $\geq 19$  years).

**Methods:** Mandibular advancement surgery with rigid fixation was provided to all patients, with or without simultaneous maxillary surgery. All lateral cephalometric radiographs were digitized, and changes in specific landmark positions at 1 and 5 years after surgery were measured as means and percentages. Standard analysis of covariance was used for measurements between the 2 groups. Additionally, questionnaires looking at treatment satisfaction, quality of life, occlusion, facial sensation, and functional problems were completed by a subset of patients, and unpaired *t*-tests compared ratings of the 2 groups.

**Results:** The mean posterior relapse was greater in the younger patients (-3 mm) than in the older patients (-0.3 mm), demonstrated at B-point, gonion, and pogonion. More than 50% of the younger group demonstrated posterior movement of pogonion between 2 and 4 mm between 1 and 5 years, and an additional 25% of this younger group had relapse  $>4$  mm posteriorly at the same point. Only 15% of the mature group exhibited posterior changes between 2 and 4 mm in this time period, while none of the mature group had  $>4$  mm of relapse at pogonion. Horizontal changes at condylion were insignificant in both groups, and horizontal changes at gonion expressed as a percentage difference were similar between groups. Vertical changes in B-point were noted as more likely to move up in the younger group, with 15% of this group exhibiting  $>4$  mm superior change in the position of B-point. Both groups showed a predominant downward movement of gonion. The mean mandibular plane angle decreased overall in the older group and increased in the younger group. Although no statistically significant difference was noted in the satisfaction or psychosocial surveys between groups, the younger group reported higher satisfaction and fewer problems.

**Conclusions:** Cephalometric changes continue in the 1- to 5-year period after orthognathic surgery whether due to relapse, late growth expression, or compensatory remodeling. In this study, the less mature group experienced a greater posterior change of chin position than that observed in the more mature group.

**Reviewer's Comments:** This is a nice study demonstrating more stable orthognathic results in adults than children. No big surprises here, but, as the authors state, the surgery performed in younger age groups is usually accomplished early due to social issues combined with more noticeable dentofacial deformities. (Reviewer-Michael L. Ellis, DDS).

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Keywords: Stability, Adolescent, Adult, Surgery, Mandibular Deficiency

Print Tag: Refer to original journal article

## Is Mandibular Motion Improved After Orthodontic Plus Surgical Therapy?

*Mandibular Kinematics After Orthognathic Surgical Treatment: A Pilot Study.*

Sforza C, Ugolini A, et al:

Br J Oral Maxillofac Surg 2010; 48 (March): 110-114

Functional adaptation of the TMJ is a remarkable success multiplier in combined orthodontic and surgical therapies.

**Objective:** (1) To evaluate TMJ kinematics after orthognathic surgery; (2) to assess the effect of morphology on postoperative mandibular movements; and (3) to look at the relationship of morphology and function in this dentofacial deformity population.

**Design:** Prospective clinical pilot study with 7 to 49 months of follow-up.

**Participants:** 14 adult patients with skeletal malocclusions devoid of TMJ signs or symptoms; 5 patients were Class II, and 9 patients were Class III. Forty-four healthy test subjects served as controls.

**Methods:** All patients underwent preoperative orthodontics and received a variety of surgical interventions designed to alleviate their skeletal malocclusions. The patients then continued postoperatively with finishing orthodontics. All 14 patients were evaluated with 3-D TMJ movement analysis, and the data were compared with that of a group of 44 subjects (controls) with Class I ideal occlusions and healthy joints. The SMART System video-captured mandibular measurements and static and dynamic motion data via 6 predetermined, reproducible, passive markers. A coordinate system defined an intercondylar axis, a mandibular plane, and a cranial plane for 3 repetitions, and a mean value was computed for each test subject. Mathematical modeling separated rotation and translation, providing relative contribution percentages with each frame capture. Patient data and test subject data were analyzed with non-parametric testing, and rank correlations were done with Bonferroni corrections as indicated.

**Results:** Class III patients were significantly older than the control population. Class II patients had a larger mandible than did controls. Patients had less movement described as incisor displacement than did controls. Percentage movement, defined as pure rotation, was larger in Class II patients than in controls. Mandibular length is a predictor of maximum incisor opening (MIO), but mandibular width is not. The MIO was significantly less in the postsurgical group of patients than in the healthy controls and was unrelated to the percentage of rotation.

**Conclusions:** Translational condylar movements were inferior in the patients receiving orthognathic surgery when measured against the control group. Functional adaptation of the TMJ after orthognathic surgery (represented as condylar remodeling, changes in lateral pterygoid muscle function, changes in the temporomandibular ligament, or neuromuscular feedback) may explain the variability of movement patterns between the postsurgical patients and the control group.

**Reviewer's Comments:** The lack of presurgical kinematic data in the orthognathic surgery patient group seriously compromises the validity of this pilot study, along with a statistically weak size difference between test subjects and controls and a widely variable follow-up period. Although the authors state that "mandibular movement was well restored by orthodontic treatment combined with orthognathic procedures," which is likely to be true, this study offers little to corroborate this tenant. (Reviewer-Michael L. Ellis, DDS).

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Keywords: TMJ, Operation, 3-Dimensional Movement

Print Tag: Refer to original journal article