# Who Is at Risk for Clostridium difficile-Associated Diarrhea?

*Identification of Risk Factors for the Development of Clostridium difficile-Associated Diarrhea Following Treatment of Polymicrobial Surgical Infections.*

Metzger R, Swenson BR, et al:

Ann Surg 2010; 251 (April): 722-727

Older, severely ill patients with polymicrobial infections are the most likely individuals to acquire *Clostridium difficile*-associated diarrhea after treatment.

**Objective:** To determine if there are identifiable risk factors for the development of *Clostridium difficile*-associated diarrhea in surgical patients after treatment of polymicrobial infections.
**Design:** Record review of an 11-year dataset of consecutive infections treated in surgical patients in a single hospital. Data were prospectively collected on adult surgery and trauma surgery patients.
**Participants:** 4178 intra-abdominal, surgical site, or skin or skin-structure infection patients.
**Methods:** Data were collected on patients previously treated for any infection who required readmission with a new infection including *C. difficile*-associated diarrhea. Collected data included chart reviews, patient examination findings, results of physician interviews, and reviews of pharmacy, laboratory, and microbiologic data. Patient data included age, gender, race, patient location at the time of *Clostridium* diarrhea diagnosis, pre-infection medical comorbidities, and the use or nonuse of transfusions. *C. difficile* infection was diagnosed by culture or toxin assay. All infections treated initially or at any time with metronidazole, penicillins, ureidopenicillins, cephalosporins, carbapenems, aminoglycosides, fluoroquinolones, and clindamycin were identified and categorized by the occurrence of subsequent *C. difficile*-associated diarrhea.
**Results:** 98 (2.3%) of the 4178 infection patients developed *C. difficile*-associated diarrhea. Of the 98 affected patients, 65 had been treated for intra-abdominal infections, 22 for surgical site infections, and 11 for skin or skin-structure infections. Patients who developed *C. difficile*-diarrhea were more likely to be of advanced age, have pre-existing pulmonary disease, have had a transfusion, and have acquired the infection while hospitalized. *C. difficile* patients were likely to have been on ventilator support or dialysis or to have received a transfusion. At diagnosis, the white blood cell count was 13,700. Ten of the 98 patients died, for a crude mortality rate of 12.7%. The median length of antibiotic treatment before developing *C. difficile* diarrhea was 8.5 days, and 43.9% of the patients received >1 antibiotic. Fifty percent of the patients were still receiving antibiotics when they developed the *C. difficile* infection. Patients treated with carbapenem developed *C. difficile* infection at a 3.5% rate. Patients treated with other antibiotics had a 2.1% rate of *C. difficile* infection.
**Conclusions:** Older patients with severe illness are most likely to develop *C. difficile* infections while being treated with antibiotics. No specific antibiotic class was found to be associated with an increased incidence of *C. difficile* infection.
**Reviewer's Comments:** A really interesting paper! Patients with odontogenic infections that are polymicrobial in nature often receive multiple antibiotics for a prolonged period and may develop *C. difficile*-associated diarrhea. (Reviewer-Sterling R. Schow, DMD).



Keywords: Infection,*Clostridium difficile*-Associated Diarrhea

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# Female Facial Trauma of Undetermined Origin Points to Partner Violence

*Markers for Intimate Partner Violence in the Emergency Department Setting.*

Perciaccante VJ, Care JW, et al:

J Oral Maxillofac Surg 2010; 68 (June): 1219-1224

Injury to the facial area in a female of unknown etiology points toward intermittent partner violence.

**Objective:** To determine whether defined screening questions combined with injury location provides a set of markers with better specificity toward interpersonal violence in females.
**Design:** A prospective study of patients with facial trauma of undetermined origin.
**Participants/Methods:** 300 patients reporting to the emergency department with trauma of unknown origin were entered into the study. Injury to the facial area combined with a positive response to specific questions (whether the female felt safe in her current relationship; whether she had ever been head kicked, punched, or otherwise hurt by an intimate partner; or whether the partners in the relationship worked out their tensions amicably) can lead to an etiology of personal violence in a case in which violence can be suspected.
**Results:** There was a direct correlation between injury to the facial area and positive answers to the Partner Violence Screen or the Women's Abuse Screening Tool. These are indicators of personal violence as the etiology for trauma when violence was not reported by the victim.
**Conclusions:** Positive answers to screening questionnaires, along with facial trauma, may indicate an etiology of intimate partner violence even when violence was not reported by the victim.
**Reviewer's Comments:** This is an excellent study and shows that careful screening of female patients with facial trauma of unknown origin may lead to a diagnosis of intimate partner violence, which may prevent more serious injury in the future. (Reviewer-Edwin D. Joy, Jr, DDS).



Keywords: Females, Interpersonal Violence, Screening, Emergency Department

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# Does Harvest Site Plating Reduce Fx Incidence With Osteocutaneous Radial Free Flap?

*Review of the Radial Free Flap: Still Evolving or Facing Extinction? Part Two: Osteocutaneous Radial Free Flap.*

Avery CME:

Br J Oral Maxillofac Surg 2010; 48 (June): 253-260

The addition of prophylactic internal fixation of a radius defect site after osteocutaneous radial free flap harvest significantly reduces fracture at the harvest site.

**Objective:** (1) To review the osteocutaneous radial free flap, along with newer harvest site stabilization techniques, and (2) to consider the continuing role of this flap in head and neck reconstruction.
**Design:** Literature review.
**Methods:** Large series of review articles and observational studies utilizing long-term data were reviewed. These included current surveys of British oral and maxillofacial surgeons, as well as human and animal studies. Techniques and indications for the osteocutaneous radial free flap are described in detail, and morbidities are addressed. In particular, the major morbidity of fracture at the harvest site is considered with regard to methods of prophylactic stabilization. Prophylactic internal fixation (PIF) is reviewed as one adjunct of therapy aimed at reducing this morbidity at the harvest site.
**Results:** Somewhat limited in volume, the osteocutaneous radial free flap provides the opportunity for a well-nourished composite reconstruction of mandibular continuity defects, low-level maxillary defects, and other small maxillofacial defects. The potential morbidity at the donor site after osteotomy, namely fracture of the radius, has been reported at a rate of between 15% and 43%, no matter the method or duration of cast stabilization. In addition, there is no difference in this morbidity rate with regard to osteotomy design, although beveling is recommended, as is limiting the osteotomized segment to 30% of the cross-sectional area. The authors note that the radius fractures commonly at the narrowest point (the mid-point of the osteotomy), and that the use of a screw-hole depth gauge or Mitchell's trimmer is recommended. Utilizing PIF with bicortical fixation (either anteriorly or posteriorly at the harvest site) and spanning the osteotomized segment of defect radius with a low-profile bone plate and bicortical fixation of at least 2 screws on each side can reduce the fracture rate to nearly zero. PIF, therefore, greatly reduces the very real concern of fracture that historically clouds the osteocutaneous radial free flap reconstruction effort.
**Conclusions:** Although many reconstructive surgeons now favor harvesting fibula, ilium, or scapula for free flap reconstructions in the head and neck, the osteocutaneous radial free flap coupled with prophylactic internal fixation remains an excellent alternative in the following individuals: medically compromised, gait-challenged patients; those with significant vascular disease; and those with small-volume maxillofacial defects requiring oral lining and without expectation of implant-supported dental reconstruction.
**Reviewer's Comments:** A large, randomized, prospective study has not been accomplished to evaluate the efficacy of the prophylactic internal fixation of the osteotomized radius as described in this paper. Strengthening the radius with a bone plate, as the author notes, could lead to stress shielding and late fractures. The author has provided an excellent technique and literature review, with insightful commentary regarding potential postoperative concerns. These include the need to assess locking plates for this technique for long-term clinical success. (Reviewer-Michael L. Ellis, DDS).



Keywords: Radial Free Flap, Osteocutaneous, Plate, Prophylactic Bone Plating, Morbidity

Print Tag: Refer to original journal article

# Angle Mandibular Fx Can Be Treated With One Noncompression Miniplate

*Comparison of a Single Noncompression Miniplate Versus 2 Noncompression Miniplates in the Treatment of Mandibular Angle Fractures: A Prospective, Randomized Clinical Trial.*

Danda AK:

J Oral Maxillofac Surg 2010; 68 (July): 1565-1567

With maxillomandibular fixation, one miniplate at the superior border of the mandible is sufficient to treat an angle fracture.

**Objective:** To compare postoperative complications in 2 randomized groups of patients with unilateral angle mandibular fractures. The first group was treated with 2 miniplates, and the second group was treated with 1 miniplate.
**Design:** This was a prospective, randomized, clinical study of 2 comparable groups of patients with unilateral angle fractures of the mandible.
**Participants/Methods:** 54 patients with unilateral mandibular fractures were equally divided into 2 groups. There was no statistical difference demographically between the 2 groups. Group 1 was treated with 2 weeks of maxillomandibular fixation and 2 miniplates across the fracture site. The second group was treated in the same way except for the use of only 1 miniplate. The patients were followed up at 1, 2, 4, and 6 weeks after surgery. Complications assessed were malocclusion, infection, and wound dehiscence.
**Results:** There was no significant difference in malocclusion or in the infection rate between the 2 groups. Wound dehiscence occurred in 3 patients in group 1 and 2 patients in group 2. One patient from both groups required plate removal.
**Conclusions:** Combined with 2 weeks of maxillomandibular fixation, there was no difference in any of the parameters tested between a group of patients treated with 1 plate versus patients treated with 2 plates.
**Reviewer's Comments:** None of the criteria studied determined whether there was any incidence of nonunion in either of the groups; however, it does appear that when combined with maxillomandibular fixation for 2 weeks, there was no difference in treating the fracture with either 1 or 2 miniplates. I wonder if there would have been any difference if no miniplates were used. (Reviewer-Edwin D. Joy, Jr, DDS).



Keywords: Mandibular Angle Fractures, Treatment, Miniplates

Print Tag: Refer to original journal article

# Effect of Zoledronic Acid on Mandibular Bone Turnover

*Scintigraphic Evaluation of Mandibular Bone Turnover in Patients With Solid Tumors Receiving Zoledronic Acid.*

Van den Wyngaert T, Huizing MT, et al:

Oral Oncol 2010; 46 (March): 214-218

Compared to the femur, bisphosphonates (zoledronic acid) exert a stronger effect on mandibular bone turnover.

**Objective:** To compare the effects of bisphosphonate therapy in the ratio of mandibular bone turnover compared to other skeletal sites in patients with metastatic disease being treated with zoledronic acid.
**Design:** Nuclear semiquantitative bone scintigraphy study.
**Participants:** 40 patients with skeletal metastases from a solid tumor treated with zoledronic acid, 40 patients with metastatic disease but no treatment with zoledronic acid, and 40 controls with no malignancy who did not receive bisphosphonates.
**Methods:** The matching of subjects in the 3 groups was performed for age, gender, tumors, treatment, and disease duration. Patients receiving zoledronic acid received 4 mg of the drug intravenously every 3 to 4 weeks. All patients were imaged 3 hours after receiving IV medronate labeled with 99mTc. Whole-body scintigraphy consisting of anterior and posterior views was acquired. The skeletal uptake of the labeled bisphosphonate was analyzed semiquantitatively. Regions of interest for comparison included the mandible, both femur diaphyses, the medial soft tissues of the thigh, and the lumbar vertebrae. Scintigraphy allowed the quantification of bone turnover of one region compared to the others. In patients receiving zoledronic acid, corrected mandibular bone turnover was calculated for each patient by subtracting the ratio of bone turnover between the lumbar spine and the femur.
**Results:** The 3 groups were well matched for factors that could affect bone turnover. The mean mandibular bone turnover was 2.49 in zoledronic acid-treated cancer patients, 2.84 in cancer patients not taking bisphosphonates, and 3.0 in patients with neither cancer nor bisphosphonate treatment. The ratio of mandibular bone turnover between nonusers of bisphosphonate and bisphosphonate users was 0.95. The mean vertebral bone turnover was 3.70 in cancer patients taking zoledronic acid, 3.78 in matched cancer patients not taking zoledronic acid, and 4.01 in patient controls. The differences in tracer deposition can be explained by the reciprocal reduction of osteoblast activity and bone formation caused by bisphosphonate osteoclast inhibition. Zoledronic acid had a greater effect on mandibular than femoral or vertebral tracer deposition, causing a decrease in the mean ratio of bone turnover between the sites of up to 17%.
**Conclusions:** These results suggest that zoledronic acid, a potent nitrogen-containing bisphosphonate, exerts a stronger effect on mandibular bone turnover relative to the femur—a clue into the susceptibility of the jaws for development of osteonecrosis of the jaw.
**Reviewer's Comments:** The inhibition of bone resorption by bisphosphonate medications and the resulting reduction in bone remodeling capacity is considered the underlying cause of bisphosphonate-related osteonecrosis of the jaw. This paper suggests that zoledronic acid has a greater effect on the mandible than on other skeletal areas. (Reviewer-Sterling R. Schow, DMD).



Keywords: Solid Tumors, Mandibular Bone Turnover, Zoledronic Acid

Print Tag: Refer to original journal article

# Closed vs Open Tx of Subcondylar Fractures -- Which Gives Better Results?

*Open Versus Closed Treatment of Unilateral Subcondylar and Condylar Neck Fractures: A Prospective, Randomized Clinical Study.*

Danda AK, Muthusekhar MR, et al:

J Oral Maxillofac Surg 2010; 68 (June): 1238-1241

There is no difference in functional results between open and closed treatment of mandibular condylar fractures.

**Objective:** To compare closed treatment with open reduction and internal fixation for unilateral subcondylar and condylar neck fractures.
**Design:** Prospective, randomized, clinical study.
**Participants/Methods:** 32 patients with unilateral condylar fractures were divided into 2 groups of 16 each and randomly assigned to be treated with closed reduction or with open reduction and rigid fixation. Patients were followed up for an average of 22 months. Mandibular function, including maximum opening, lateral excursions, protrusion, joint pain, and malocclusion, was measured at the last follow-up visit. The 2 groups were statistically compared for these parameters.
**Results:** The open reduction group showed a slightly better result in all parameters tested; however, these differences were not statistically significant. There was a statistically significant improvement in anatomic alignment of the condyle in the open reduction group.
**Conclusions:** There was a slightly better result in all parameters in the open reduction and rigid fixation group, but it did not achieve statistical significance. There was a statistically significant better result in condylar anatomic alignment in the open reduction rigid fixation group.
**Reviewer's Comments:** This difference favoring open reduction would probably have been statistically significant if the group size was larger. The results in this study do not strongly support the conclusion since the statistical significance may be due to an inadequate sample size. (Reviewer-Edwin D. Joy, Jr, DDS).



Keywords: Unilateral Subcondylar Fractures, Condylar Neck Fractures, Reduction/Fixation

Print Tag: Refer to original journal article

# Knowing the Indications for Use of Osteocutaneous Forearm Free Flaps

*Functional Outcomes of Fibula and Osteocutaneous Forearm Free Flap Reconstruction for Segmental Mandibular Defects.*

Virgin FW, Iseli TA, et al:

Laryngoscope 2010; 120 (April): 663-667

The functional outcomes of osteocutaneous radial forearm reconstruction of smaller mandibular segmental defects are comparable to those obtained using fibula free flaps.

**Objective:** To compare the osteocutaneous radial forearm free flap to the fibular free flap to show that it provides equivalent functional outcomes and improved morbidity in mandibular reconstruction.
**Design:** Retrospective record review.
**Participants:** 168 patients requiring free flap reconstruction of segmental mandibular defects were included.
**Methods:** Fibula free flaps were used to reconstruct 117 (69.5%) of the mandibular defects and an osteocutaneous radial forearm free flap was used for 51 (30.5%). The radial flap was used in patients with a mean age of 63.7 years compared to a mean age of 59 years for patients receiving fibula free flaps. The follow-up mean times after reconstruction were 31 months when fibula flaps were used and 20.4 months when radial flaps were used. Anterior mandibular defects were treated most often with the fibula flap and lateral defects most often with radial flaps. Malignancy was the most common indication for segmental mandibulectomy and free flap reconstruction. Functional data after surgery were accumulated through a retrospective chart review.
**Results:** At the last follow-up visit, 72.6% of the fibula-reconstructed patients and 79.1% of the radial flap patients could manage an oral diet with some modifications. The length of hospitalization for both groups was just over 9 days. Only 5.8% of the radial flap patients received dental implants, and all required some additional grafting. Only 1% of the fibula flap patients received dental implants. In regard to complications, 17.9% of the fibula patients and 25% of the radial flap patients had early complications, usually skin paddle loss with the fibulae and infection with the radial flaps. Late complications were seen with 11.9% of fibula reconstructions and 13% of radial reconstructions. Malunion was most common with fibula flaps and hardware exposure was most common with radial flaps.
**Conclusions:** When the defect to be reconstructed is appropriate, osteocutaneous radial forearm free flaps provide comparable functional outcomes to fibula free flaps without the morbidity of the latter.
**Reviewer's Comments:** For defects ≥10 cm in length, the free fibula is likely a better choice for mandibular defect reconstruction. However, harvest of the fibula results in around 3 months of gait disturbance, which can effectively cripple elderly patients. Patients with lower extremity peripheral vascular disease are also poor candidates for fibula reconstruction. Of interest was the low number of free flap patients who received implant-supported prostheses. The reality, at least in my experience, is that very few of these patients can afford implant reconstruction and third-party coverage is rare or insufficient. (Reviewer-Sterling R. Schow, DMD).



Keywords: Osteocutaneous Radial Forearm Free Flap, Fibular Free Flap

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# Chlorhexidine Gel Safely Prevents Dry Socket in Patients With Bleeding Disorders

*Randomized, Double-Blind Study of Effectiveness of Intra-Alveolar Application of Chlorhexidine Gel in Reducing Incidence of Alveolar Osteitis and Bleeding Complications in Mandibular Third Molar Surgery in Patients With Bleeding Disorders.*

Torres-Lagares D, Gutierrez-Perez JL, et al:

J Oral Maxillofac Surg 2010; 68 (June): 1322-1326

The single intra-alveolar application of 0.2% chlorhexidine gel intraoperatively seems to reduce the incidence of alveolar osteitis after removal of impacted third molars in patients with bleeding disorders.

**Objective:** To evaluate the efficacy of the intra-alveolar use of chlorhexidine gel in the prevention of alveolar osteitis and bleeding complications after extraction of impacted third molars in patients with bleeding disorders.
**Design:** Randomized, double-blind, prospective clinical trial.
**Participants/Methods:** 38 patients with bleeding disorders were divided into 2 groups. All patients required the removal of a mandibular impacted third molar. Twenty-four patients were in the experimental group and 14 in the control group. The experimental group had the removal of a third molar and the application of chlorhexidine gel into the alveolar socket. The control group had the same procedure but did not have the bio-adhesive gel application. The sockets were then sutured. The number of cases of alveolar osteotomy in the 2 groups was compared statistically. The number of bleeding complications in each group was also compared statistically.
**Results:** There were 4 cases of alveolar osteitis in the control group and 1 case in the experimental group. This was not statistically significant. There were 7 bleeding complications in the control group and 3 bleeding complications in the experimental group. This difference was not statistically significant.
**Conclusions:** Although not statistically significant, there was a lower incidence of alveolar osteitis in the experimental group than in the control group. There was also a reduced incidence of bleeding in the experimental group than in the control group. Although not statistically significant, there was a reduced incidence of alveolar osteitis in the chlorhexidine group. There was also less bleeding in the chlorhexidine group.
**Reviewer's Comments:** Although the difference in the 2 groups was not statistically significant, this was probably due to the small number of patients in each group. A larger number of patients entered in the study probably would have resulted in statistically significant differences. (Reviewer-Edwin D. Joy, Jr, DDS).



Keywords: Dentoalveolar Surgery, Chlorhexidine Gel, Bleeding Complications

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# Are Pain Pumps Worth the Money?

*Continuous Bupivacaine Infusion in Iliac Bone Graft Donor Sites to Minimize Pain and Hospitalization.*

Sbitany H, Koltz PF, et al:

Cleft Palate Craniofac J 2010; 47 (May): 293-296

Continuous bupivacaine infusion into iliac crest bone graft donor sites significantly reduces postoperative pain, analgesic requirements, and length of hospital stay.

**Objective:** To evaluate the effectiveness of a continuous infusion of bupivacaine in the iliac crest donor site for reducing postoperative pain and length of hospitalization.
**Design:** Retrospective chart review.
**Participants:** 40 iliac harvest patients -- 20 of whom had intraoperative placement of a bupivacaine infusion pump.
**Methods:** The medical records of 40 patients who underwent alveolar bone grafting using autologous anterior iliac crest donor areas were reviewed. All bone harvests were done by the same surgeon. The first 20 patients had a routine definitive closure of their donor site with no indwelling catheter. The last 20 patients had identical harvests but at donor site closure, an indwelling local anesthetic infusion pump catheter was placed. The pump was programmed to administer 0.25% bupivacaine at a rate of 2 cc per hour. The pain pump catheter was placed within the cavity left in the iliac crest by the cancellous bone harvest. Catheter perforations allowed anesthetic delivery in the iliac crest and in the area of periosteal stripping. Data compiled included postoperative opioid analgesic use, self-reported pain indices, length of hospital stay, and complications.
**Results:** The 2 groups of patients were well matched demographically. The pain pump catheters were left in place an average of 3 days. Mean length of hospital stay was 2.9 ± 0.8 days when a pain pump was not used and just 1.4 ± 0.5 days when a pump was used. Mean pain scores the day of surgery were 6.1 for non-catheter patients and just 2.3 on a 10-point scale when a pump was used. On postoperative day 1, mean pain scores were 5.1 for the non-pump patients and 1.5 for those who had a pump.
**Conclusions:** Using a pain pump continuously infusing 2 cc per hour of 0.25% bupivacaine in iliac crest donor sites significantly reduces postop narcotic requirements, perceived postop pain, and the length of hospitalization.
**Reviewer's Comments:** We routinely use a pain pump in our iliac crest and costochondral graft donor sites. The cost of the pump is small compared to the reduction in hospitalization time and the improved postoperative course the patients experience. (Reviewer-Sterling R. Schow, DMD).



Keywords: Grafts, Bupivacaine, Pain, Length of Stay

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# Problems With Bite, Function Are Prime Reasons for Undergoing Orthognathic Surgery

*Motivating Factors for Patients Undergoing Orthognathic Surgery Evaluation.*

Proothi M, Drew SJ, Sach SA:

J Oral Maxillofac Surg 2010; 68 (July): 1555-1559

Although appearance is mentioned by most patients, the prime reason for seeking orthognathic surgery is functional problems with the bite or jaw function.

**Objective:** To examine primary motivations for orthognathic surgery, as well as an evaluation of symptoms exhibited by these patients.
**Design:** Retrospective chart review of patients who had undergone orthognathic surgery.
**Participants/Methods:** A survey questionnaire of 501 patients aged >12 years who underwent orthognathic surgery was reviewed. Prime questions included were the patients' age, gender, does the problem affect appearance, does the problem affect speech or swallowing, what is the prime motivation for seeking surgery, and could the patient identify from pictures in the survey their own facial deformity.
**Results:** Although 76% of patients stated that there was a problem with their appearance, the majority of patients picked out a bite problem as the motivation for seeking surgery.
**Conclusions:** Although most patients recognized an esthetic component to their problem, the main purpose for seeking surgery was identified as a functional problem. Functional problems seemed to be the prime motivating factor in seeking orthognathic surgery.
**Reviewer's Comments:** This is an interesting study that may, indeed, be biased if the patients knew that only functional problems would lead to financial coverage for their surgery by a third party payer. (Reviewer-Edwin D. Joy, Jr, DDS).



Keywords: Orthognathic Surgery, Symptoms, Primary Motivations

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# Use of ADM in Alveolar Cleft Grafting Prevents Postop Graft Exposure

*Autologous Bone Grafting With Adjunctive Use of Acellular Dermal Matrix for Alveolar Cleft Defects: Early Outcomes.*

Clavijo-Alvarez JA, Vecchione L, et al:

Cleft Palate Craniofac J 2010; 47 (March): 116-121

Using acellular dermal matrix augmentation of mucosal coverage in cleft repair does not improve healing time but can improve graft incorporation by preventing graft exposure.

**Objective:** To evaluate the use of acellular dermal matrix in grafting of alveolar cleft defects as an additional layer of soft-tissue coverage to protect the bone graft.
**Design:** Retrospective review.
**Participants:** 35 alveolar cleft patients.
**Methods:** The patients included in the study were consecutively treated, with 15 of 35 incorporating acellular dermal matrix (ADM) into the nasal and/or oral mucosal repairs. The hope was that the additional layer of soft tissue coverage would help protect the bone graft from exposure or loss during the healing process. Patients included were followed a minimum of 3 months. Outcomes looked at oral mucosal suture line integrity, time to complete mucosal healing, bone graft exposure, graft incorporation, and canine eruption through the graft site. A group of randomly selected control patients, who did not have ADM but were operated on by the same surgeon, was selected.
**Results:** If a compromised nasal or oral cleft lining repair was noted, a piece of ADM was sewn to the oral side of the nasal lining repair or to the cleft side of a defective oral mucosa repair. The ADM material was always adjacent to the bone graft, with nasal or oral mucosa repair between the ADM and the external environment. A delay in oral mucosa suture line healing was noted in 30% of control cases and in 20% of ADM patients. Average time for complete mucosal healing in both groups was 4 weeks. Oral mucosa suture line disruption that allowed bone graft exposure occurred in 30% of control cases, but in none of the patients where ADM supplemented the mucosal closure. Bone graft incorporation was not significantly different between the 2 groups nor was canine eruption through the grafted area.
**Conclusions:** The use of ADM to improve mucosal closure over alveolar cleft bone grafts improved mucosal healing, prevented graft exposure, and had no negative effect on graft incorporation.
**Reviewer's Comments:** This is a very interesting, nicely illustrated paper. I have not used ADM materials in this type of surgery, but can think of several instances when it could have been helpful. (Reviewer-Sterling R. Schow, DMD).



Keywords: Grafting, Alveolar Cleft Acellular Dermal Matrix

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# Can CT Help Predict Postoperative Paresthesia?

*Cortical Integrity of the Inferior Alveolar Canal as a Predictor of Paresthesia After Third-Molar Extraction.*

Park W, Choi JW, et al:

J Am Dent Assoc 2010; 141 (March): 271-278

A loss of inferior alveolar canal cortical integrity is a good indicator of possible sensory loss after third molar removal.

**Objective:** To see if there is a relationship between postoperative removal of mandibular third molar paresthesia and the preoperative determination of loss of canal cortical integrity as determined by computed tomography (CT).
**Design:** Retrospective cohort study.
**Participants:** 179 patients who had 259 mandibular third molars removed.
**Methods:** All patients had been referred to the authors for removal of impacted third molars. Each patient had a routine clinical and panoramic radiographic evaluation. If the panoramic film showed any evidence of increased risk for inferior alveolar nerve damage, the patients then had preoperative CT imaging. All 179 patients completed the preoperative CT imaging with 1-mm slice thickness. Third molar removal was completed thereafter and the patients were followed 1 and 7 days after surgery. If there was postoperative paresthesia, a follow-up was recommended each week for 1 month and then each month thereafter. Neurologic deficits were evaluated using cold, pinprick, brushstroke, and 2-point discrimination evaluations. Patients were grouped as those with no contact between tooth roots and the mandibular canal, contact between the root and the intact cortical canal border, and tooth root contact with the canal with interruption of the canal's cortical outline.
**Results:** The overall incidence of inferior alveolar nerve paresthesia was 4.2% after mandibular impacted third molar removal. In the 2 groups of patients whose canal cortical outlines remained intact, even if the root was in contact, there was only 1 case of paresthesia (<0.5%). When there was third molar root contact with the canal with loss of a radiographic cortical outline, the postoperative paresthesia rate was 11.8%. When the canal's cortical outline was interrupted, there was a 20-fold increased risk of paresthesia following third molar removal compared to situations where the cortical outline was radiographically intact. The incidence of paresthesia increased to up to 21.4% when the loss of cortical outline was observed on ≥3 image slices.
**Conclusions:** Radiographic cortical interruption of the mandibular canal associated with an impacted third molar's root in contact with the canal indicates a higher risk of paresthesia when the tooth is removed.
**Reviewer's Comments:** When panoramic images indicate a high risk for postoperative paresthesia associated with mandibular third molar removal, a CT scan may help the surgeon develop an alternative treatment plan, such as a coronectomy. (Reviewer-Sterling R. Schow, DMD).



Keywords: Paresthesia, Third Molar Extraction, CT

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# Sinus Floor Elevation May Increase Bone Volume Without Using Grafts

*Indirect Sinus Floor Elevation for Osseointegrated Prostheses. A 10-Year Prospective Study.*

Agamy EM, Niedermeier W:

J Oral Implantol 2010; 36 (March-April): 113-121

An indirect method of sinus floor elevation with immediate implant placement without grafting can successfully increase bone volume in moderately atrophic posterior alveolar areas.

**Objective:** To evaluate the indirect or closed maxillary sinus floor elevation technique for insertion of osseointegrated implants.
**Design:** Prospective clinical evaluation.
**Participants:** 31 patients, each of whom received at least 2 posterior maxillary implants.
**Methods:** Patients selected for this clinical and radiographic evaluation needed at least 2 implants. One implant was placed using a standard technique and one was placed along with indirect or closed sinus floor elevation. Study implant sites were prepared to be 1 to 2 mm beneath the sinus floor. A specially designed instrument inserted through the prepared site was used to greenstick fracture and elevate the sinus floor along with the sinus membrane. The implant was then placed. Average implant length for the study implants was 12 mm. The average available residual alveolar bone height was 9.82 mm. Control implants were placed in alveolar processes with an average 15.5-mm bone height. Implants were placed using a 2-stage technique and were allowed a healing period of approximately 9 months before prosthetic loading. Panoramic radiographs were taken immediately after fixture placement, before loading, and 24 months after loading to evaluate bone gain in the sinus floor. No grafts were placed.
**Results:** 31 control implants were placed; 1 failed before loading and another 2 failed after 20 months. Forty-seven study implants were placed, and 3 failed 2 months after loading. Implant failures were independent of the treatment method. There were no sinus complications following surgery. The average amount of sinus floor elevation was 2.95 mm with an increase of apical bone thickness in study implant sites of 1.85 mm. Crestal bone level changes were not significantly different between the study and control implants.
**Conclusions:** The indirect/closed sinus lift without grafting is an effective technique for implant placement in moderately atrophied posterior maxillary alveolar processes.
**Reviewer's Comments:** This is a clearly presented paper with patients having implants placed to act as the control fixtures in areas where adequate alveolar bone was available. New sinus floor bone was formed without placing graft material. (Reviewer-Sterling R. Schow, DMD).



Keywords: Implants, Survival Rates, Sinus Elevation

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# DynaMatrix Increases Amount of Attached Keratinized Gingiva

*The Clinical Efficacy of DynaMatrix Extracellular Membrane in Augmenting Keratinized Tissue.*

Nevins M, Nevins ML, et al:

Int J Periodontics Restorative Dent 2010; 30 (March-April): 151-161

Keratinized attached mucosa augmented with an extracellular matrix membrane has excellent color, blends well, and is more aesthetic than similar augmentations with free gingival grafts.

**Objective:** To compare the effectiveness of an extracellular matrix membrane with that of an autogenous gingival graft in increasing the width of attached keratinized mucosa.
**Design:** Prospective, randomized, comparative, split-mouth clinical study.
**Participants:** 6 patients with an inadequate amount of attached keratinized gingiva on the facial aspect of the mandibular posterior teeth bilaterally were included.
**Methods:** The patients, 5 women and 1 man with a mean age of 41 years, all had <2 mm of attached keratinized gingiva on the facial aspect of the mandibular posterior teeth bilaterally. Periodontal evaluations, including probing depth and measurement of the keratinized gingiva, were done at baseline and later at 13 weeks. At that time, clinical photographs were taken, and differences in clinical measurements between baseline and at 13 weeks after surgery were compared. After randomization by sides, split-thickness supra-periosteal dissections with incisions at the junction of attached gingiva and alveolar mucosa were done to lower vestibular depth. Gingival grafts of uniform thickness obtained from the hard palate or a DynaMatrix extracellular membrane were stabilized on the periosteal graft bed with sutures. A periodontal dressing covered the surgical sites and was left in place 2 weeks. Patients were followed up 2, 4, 6, 8 and 13 weeks later. A 4-mm punch biopsy from both control and test sites was obtained at the 13-week visit for histologic evaluation.
**Results:** All patients healed with no serious adverse events. Tissue healing and maturation were similar in both membrane and gingiva grafted areas. At 8 and 13 weeks after the surgery, the postoperative result was maintained and stable and mature. The sites grafted with the extracellular membrane blended well with the surrounding soft tissues without the typical "tire-patch" appearance usually seen with gingival grafts. With the membranes, the demarcation between the graft and the surrounding tissue was better aesthetically and much less noticeable. Histologically, no membrane remnants were noted in the 13-week postoperative punch biopsy specimens, and the overlying epithelial tissue was keratinized. The thickness of the biopsy specimens was 349 µm in the gingival graft sites and 294 µm (on average) for the membrane-grafted sites.
**Conclusions:** DynaMatrix extracellular membrane is a viable substitute for autogenous gingival grafts for increasing the amount of attached keratinized gingiva.
**Reviewer's Comments:** This membrane is obtained from the submucosa of the small intestine of pigs. Its processing retains the composition of matrix molecules of types I, III, IV and VI collagen, glycosaminoglycans, and growth factors. This is a well-written paper with an excellent discussion. (Reviewer-Sterling R. Schow, DMD).



Keywords: Grafts, Keratinized Mucosa, Augmentation, DynaMatrix

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# CBCT Imaging Helpful in Tx Planning

*Evaluation of Maxillary Sinus Anatomy by Cone-Beam CT Prior to Sinus Floor Elevation.*

Neugebauer J, Ritter L, et al:

Int J Oral Maxillofac Implants 2010; 25 (March-April): 258-265

Imaging with cone-beam CT in planning sinus lifts can help identify the presence, orientation, and size of sinus septa.

**Objective:** To determine the incidence, size, location, and morphology of maxillary sinus septa using high-resolution isotropic cone-beam computerized tomography (CBCT).
**Design:** Retrospective CBCT study.
**Participants:** 1,029 consecutive patients who had CBCT examinations as a part of their evaluation for posterior maxillary implants and sinus lifts, for trauma evaluation, evaluation prior to orthodontic treatment, or for evaluation of sinus disease were included.
**Methods:** All patients had appropriate clinical evaluations and recording of pertinent demographic and medical histories. All CBCT images were reviewed by 3 evaluators experienced in oral radiology. The observers were able to adjust the contrast and brightness of the images and to use the zoom function provided by the visualization software program. Sinus septa were identified and plotted using axial, coronal, and sagittal views. When septa were identified, their height was measured and their orientation determined.
**Results:** Maxillary sinus septa were found in 33.2% of the sinuses and in 47% of the patients. Age, sex, or right and left side had no significant effect on the presence or absence of sinus septa. Most of the patients with sinus septa had 1 septa in 1 sinus. However, 8.7% of the patients had up to 3 septa per sinus. Most septa were located in the first molar region followed by the second molar area, third molar area, and premolar areas. The mean septal height was 11.7 ± 6.08 mm for sagittally oriented septa and 7.3 ± 5.8 mm for septa with a transverse orientation. Maximum septa height was 37 mm.
**Conclusions:** Sinus septa are found in almost 50% of patients, at least in this large sample. Because most of the common complications of sinus lifts are sinus membrane perforations, usually in the area of sinus septa, CBCT imaging to determine the presence, size, and orientation of septa is helpful in treatment planning.
**Reviewer's Comments:** For many, if not most patients who will need sinus lifts, CBCT examinations may be a standard of care, especially if there is a possibility of sinus disease, to determine sinus volume, to estimate the amount of grafting material needed, and to localize sinus septa. (Reviewer-Sterling R. Schow, DMD).



Keywords: Maxillary Sinus Septa, Cone-Bean CT, Sinus Floor Elevation

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## Include a Careful Medical History at All Initial Dental Examinations

*Management of Patients at Risk of Osteoradionecrosis: Results of Survey of Dentists and Oral & Maxillofacial Surgery Units in the United Kingdom, and Suggestions for Best Practice.*

McLeod NMH, Bater MC, Brennan PA:

Br J Oral Maxillofac Surg 2010; 48 (June): 301-304

A careful medical history that queries for head and neck cancer and radiotherapy should be part and parcel to all initial dental examinations.

**Objective:** To determine specific actions taken by dentists and oral and maxillofacial surgeons (OMS) to identify previous head and neck radiation and risk factors for osteoradionecrosis (ORN), how these patients are managed who require extractions, and the evidence present for these practices.
**Design:** Random postal survey.
**Participants:** 60 dentists and 117 OMS received questionnaires.
**Methods:** Practitioners were queried regarding patient extraction management for patients with a history of head and neck radiotherapy or patients with ORN. The participants were also queried regarding specific patient questions about cancer or radiotherapy history as part of the usual work-up. Mouthwashes, antibiotics, hyperbaric oxygen therapy (HBO), and the use of vasoconstrictors were all considered, as well as the level of care assigned with regard to practitioner experience.
**Results:** With a response rate in the low 50% range, <10% had protocols in place for managing ORN at-risk patients. While 52% of the dentists specifically asked about a history of cancer, only 35% asked patients about head and neck radiation. Twenty-nine percent recommended prophylactic antibiotic coverage for current radiotherapy patients, and 16% recommended antibiotics for those with a history of radiation to the head and neck. A high majority (range, 78% to 91%) of OMS recommended preoperative chlorhexidine mouthwash, pre- and postoperative antibiotic prophylaxis, and vasoconstrictors in these patient populations, and 40% recommended HBO for those with a history of radiotherapy. A majority of dentists requested specialty level consultation for ORN and radiotherapy patients; however, in OMS units, the patients were referred to junior level practitioners.
**Conclusions:** Most dentists do not ask about cancer and radiotherapy history. There are multiple inefficiencies present in an evidenced-based approach to the treatment of this patient population, at least as expressed by this random survey. The poor response rate may also be indicative of uncertainty of protocols in place to address the head and neck cancer patient with a history of radiation.
**Reviewer's Comments:** Although a lot of measures seem sensible (eg, chlorhexidine mouthrinses, the avoidance of vasoconstrictors, antibiotic prophylaxis, treatment by experienced surgeons, and HBO therapy), there is little evidenced-based research to establish broad and stringent guidelines for these practices. This study is likely an accurate reflection of current practices and represents a broad and ill-defined approach to management of the ORN at-risk head and neck cancer patient with a history of radiotherapy. (Reviewer-Michael L. Ellis, DDS).



Keywords: Radiotherapy, Osteoradionecrosis, Oral Surgery, Medical History

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# Immediate Implant, Restoration Retains Peri-Implant Soft Tissue Shape

*Immediate Implant Placement and Restoration in the Esthetic Zone: A Prospective Study With 18 Months of Follow-Up.*

Tortamano P, Camargo LOA, et al:

Int J Oral Maxillofac Implants 2010; 25 (March-April): 345-350

After removal of teeth in the maxillary esthetic zone, immediate implant placement and restoration can be performed, and this should retain the peri-implant soft tissue shape and dimension.

**Objective:** To evaluate peri-implant soft tissue stability around immediately placed and restored implants in the maxillary aesthetic zone.
**Design:** Prospective clinical evaluation.
**Participants:** 12 healthy patients, each of whom had a maxillary central incisor that needed to be removed and replaced, were included.
**Methods:** Each patient had a thorough clinical and radiographic evaluation. Oral hygiene instruction was provided, as was any needed periodontal treatment. Impressions were made, and photographs were taken. The incisor was removed taking care to preserve the buccal cortical bone. A periodontal probe was used to check the osseous walls of the socket for dehiscence or fenestration defects. A tapered Straumann implant 12 mm in length was placed in each site with a 4.8-mm width at the alveolar crest. Any residual gap between the implant and the alveolar bone was not filled with graft material, and no membranes were placed. Immediate provisional restorations were placed that were completely in contact with the surrounding soft tissues. The provisional restorations were kept out of occlusal contact. Six weeks later, final restorations were placed. Patients were seen in follow-up at 3, 6, 12, and 18 months later. At each follow-up, the residual dental papillae were measured, as was the length of the clinical crown. These dimensions were compared to those recorded preoperatively.
**Results:** All 12 patients completed 18-month follow-up visits. Primary implant stability was obtained in each case, and there were no complications. None of the implants failed. Most of the patients had satisfactory periodontal soft tissues before the procedure, and at the 18-month follow-up, no significant changes in the peri-implant soft tissues were noted. The length of the definitive restoration also remained stable with no clinical elongation of the crown. The soft tissue dimensions remained stable, and the aesthetic contours achieved after placement of the final restoration were maintained.
**Conclusions:** After removal of teeth in the aesthetic zone, immediate implants with immediate restorations can be placed, and this should retain the peri-implant soft tissue shape and dimension. The contours of both the provisional and final restorations should be shaped to support the soft tissues similar to the tooth that was removed.
**Reviewer's Comments:** This nicely reported clinical study is worth reading if immediate implant placement and restoration is planned. Both the description of the technique and the excellent discussion contain several helpful hints. Unfortunately, the paper did not comment on osseous fill and contouring around peri-implant voids at the long-term follow-up since we know that good soft tissue maintenance is also dependent on the underlying osseous support. (Reviewer-Sterling R. Schow, DMD).



Keywords: Implants, Aesthetic Zone, Placement & Restoration

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# Nasal Function May Be Impaired After UCLP Treatment

*Objective Assessment of the Nasal Airway in Unilateral Cleft Lip and Palate—A Long-Term Study.*

Mani M, Morén S, et al:

Cleft Palate Craniofac J 2010; 47 (May): 217-224

Nasal impairment is measurable in unilateral cleft lip and palate subjects on the affected side long term.

**Background:** Unilateral cleft lip and palate (UCLP) is associated with deformity of the midface, often requiring multiple surgical treatments to help correct both form and function. However, despite the improvement surgery provides, clinical problems can still remain, especially with the function and appearance of the nose. Long-term data using objective measures of nasal function after surgery have not been previously described in the literature.
**Objective:** To compare long-term nasal function after 1-stage and 2-stage palatal closure for UCLP.
**Design:** Retrospective review.
**Participants:** 83 patients who were treated for a complete UCLP between 1960 and 1987 at Uppsala University Hospital in Sweden were included. The mean time after primary surgical treatment was 32 years. A total of 128 consecutive records were found for this time period, but some patients had associated syndromes, were living abroad, or failed to respond to the invitation to participate.
**Methods:** Patients treated from 1960 to 1977 were treated with a 1-stage palatal closure surgery. For this surgery, the palate was elongated and closed by shifting mucoperiosteal flaps medially and posteriorly. This left exposed bone that healed by secondary intention. After 1977, the soft palate was closed at around 6 months of age, and then a second surgery to close the hard palate was performed at 2 years of age. Nasal volume and cross-sectional area were objectively measured with acoustic rhinometry, using reflected sound. Airflow and pressure during respiration were measured using rhinomanometry to calculate resistance to airflow. Finally, odor identification was assessed using the Scandinavian Odor Identification Test (SOIT).
**Results:** The nasal function on the cleft side was found to be impaired compared to both the unaffected side and to age-matched controls. This impairment consisted of a significantly smaller volume and cross-sectional area, as well as higher resistance at inspiration and expiration. On the cleft side, there were no significant differences between the 2 surgical techniques, but the 1-stage surgery showed a significantly larger nasal volume on the non-cleft side. The SOIT score was significant lower in the UCLP patients compared to controls, but only the 2-stage surgery showed a significant change when analyzed separately.
**Conclusions:** UCLP subjects show long-term impairments in nasal function after palatal closure surgery. No significant differences were found between a 1-stage and 2-stage surgery on the cleft side.
**Reviewer's Comments:** One of the challenges when comparing treatment strategies for cleft conditions is that the outcome is not known for many years. In this case, the average patient was examined 32 years after palate repair surgery. These results underscore the continued challenges for cleft patients long after reconstructive surgery—in this case, the restriction of nasal airflow through the cleft side of the nose whether a 1- or 2-stage palatal closure was used. (Reviewer-Brent E. Larson, DDS, MS).



Keywords: Cleft Lip & Palate, Nasal Function

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# No Long-Term Changes in Condylar Position After Mandibular Surgical Setback

*The Assessment of the Short- and Long-Term Changes in the Condylar Position Following Sagittal Split Ramus Osteotomy (SSRO) With Rigid Fixation.*

Kim Y-I, Jung Y-H, et al:

J Oral Rehabil 2010; 37 (January 25): 262-270

After mandibular setback, the condyle was initially in a more posterior, but concentric, position and then returned to a slightly more anterior position by the time of long-term follow-up.

**Background:** Condylar position, although a controversial issue, is important for orthodontists because it may affect skeletal relapse and long-term stability. Additionally, some advocate an ideal condylar position to reduce the risk for temporomandibular joint disorder (TMD). Examination of surgical cases is especially important, because large skeletal changes are being made. However, most previous studies have only examined changes in the condylar long axis and not other assessments of condylar position.
**Objective:** To compare the short-term and long-term changes in condylar position following sagittal split ramus osteotomy (SSRO).
**Design:** Retrospective.
**Participants:** 26 adult patients (15 men, 11 women; mean age, 22.3 ± 3.2 years) with mandibular prognathism who underwent SSRO surgery with rigid fixation were included. All patients were healthy, with no severe asymmetry or TMD symptoms.
**Methods:** Condylar position was assessed using cone-beam computed tomography (CBCT). A CBCT was obtained for each subject prior to surgery, at 6 months after SSRO surgery, and during retention (18 months postoperative). Changes in the condylar axis were examined in 3 planes of space. Condylar position within the glenoid fossa was also measured.
**Results:** The mean setback for the SSRO surgery was 7.5 mm, with an average relapse of 1.6 mm. Right and left condylar angles were significantly different in the axial plane (rotated inwards) but not in the other planes of space. The condyles also tended to be in an anterior position prior to surgery, have a more concentric position 6 months postoperative, and return to a more anterior position by the post-retention period. No signs or symptoms of TMD were found in any patient.
**Conclusions:** SSRO with rigid fixation can alter condylar position shortly after surgery, and changes still occur between 6 and 18 months post-surgery. Patients in this study all adapted well to the new condylar position.
**Reviewer's Comments:** It was interesting to note that the condylar position was altered after surgery, but by the time of long-term follow-up the position was nearly back to the presurgical position. Since this happened between 6 and 18 months after surgery, it was likely due to a combination of remodeling and mandibular positioning changes. (Reviewer-Brent E. Larson, DDS, MS).



Keywords: TMJ, Condylar Position, Orthognathic Surgery, CBCT

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# Acetaminophen Plus Ibuprofen Relieves Postop Oral Surgery Pain

*Combined Acetaminophen and Ibuprofen for Pain Relief After Oral Surgery in Adults: A Randomized Controlled Trial.*

Merry AF, Gibbs RD, et al:

Br J Anaesth 2010; 104 (January): 80-88

Ibuprofen plus acetaminophen provides very good pain relief after oral surgery.

**Background:** NSAIDs are often used to treat postoperative pain. Acetaminophen is also used to treat postoperative pain at a dose of 4 g/day. A combination of NSAIDs plus acetaminophen (Maxigesic®) is available for use in the marketplace.
**Objective:** To evaluate the efficacy of Maxigesic in comparison to single use of either acetaminophen or ibuprofen in postoperative pain relief.
**Design:** Randomized, blinded, prospective, clinical study.
**Participants:** Adult patients having oral surgery (wisdom tooth or teeth extraction).
**Methods:** Patients were randomly assigned following the exclusion criteria according to the protocol to either group: (1) acetaminophen 500 mg plus ibuprofen 150 mg per tablet; (2) acetaminophen 500 mg per tablet; or (3) ibuprofen 150 mg per tablet. The patients were asked to take the tablets according to their randomization before the operation and then 4 times per day, up to 48 hours. If the pain relief was not adequate, fentanyl IV was given in the hospital or codeine after discharge. Pain was recorded on a 100 m visual analog scale (VAS) in a certain time order. The VAS ratings and the area under the curve (AUC) divided by time at rest and on activity was the primary outcome of the study. Side effects were also recorded. Pharmacokinetic data (plasma concentrations of acetaminophen and ibuprofen) were obtained through blood samples from 30 patients. Data were analyzed using SPSS version 15.0. A one-tailed $P \leq 0.05$ was statistically significant.
**Results:** 135 patients participated and 122 were analyzed. Time-adjusted AUCs were significantly lower at rest and on activity in the combined drug group than in either of the other two.
**Conclusions:** The combination of ibuprofen and acetaminophen provides very good pain relief after oral surgery.
**Reviewer's Comments:** The data are consistent with other studies showing that the combination of ibuprofen and acetaminophen provides more pain relief than application of either drug on its own. However, the optimal dosage has not been evaluated yet and could modify the pain relief. (Reviewer-Olga Plattner, MD).



Keywords: Oral Surgery, Postoperative Pain, Acetaminophen, Ibuprofen

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