

How to Find the Best Noninvasive Wound Closure Device

An In-Vivo Study of the Wound-Bursting Strengths of Octyl-Cyanoacrylate, Butyl-Cyanoacrylate, and Surgical Tape in Rats.

Taira BR, Singer AJ, et al:

J Emerg Med 2010; 38 (May): 546-550

Octyl-cyanoacrylate has a higher wound-bursting strength than butyl-cyanoacrylate, which is stronger than surgical tape.

Objective: To compare the wound-bursting strengths of octyl-cyanoacrylate (Dermabond®), butyl-cyanoacrylate (Histoacryl), and adhesive tape in the form of Steri-Strips™.

Design: Randomized, controlled, blinded animal laboratory study involving 15 Sprague-Dawley rats.

Methods: After the rats were anesthetized, hair was removed on both sides of the back, treated with a depilatory lotion, and prepped with povidone-iodine and 70% isopropyl alcohol. Standardized bilateral 2-cm full-thickness incisions were made with a #15 surgical blade and then closed with 1 of the 3 materials being studied. All closure techniques were done as recommended by the manufacturer. Randomized closures were completed on all wounds. Measurements of wound-bursting strength on each of the closures were performed using a vacuum-controlled wound chamber device that measured the pressure needed to disrupt the wound closure.

Results: Thirty 2-cm incisions in 15 rats were studied. Closure failures were evaluated as either a breakdown of the closure material itself or as a loss of adhesion to the skin surface. All the wounds closed with surgical tape had adhesive failure; they ultimately peeled off the skin surface. Wounds closed with an octyl- or butyl-cyanoacrylate ultimately experienced some cohesive, adhesive, or mixed failure breakdowns. The mean wound bursting strength of the octyl-cyanoacrylate was significantly greater than that of the butyl-cyanoacrylate, and both had significantly stronger closures than did the Steri-Strips. Breakdown of butyl-cyanoacrylate adhesion to the skin surface was more common than with octyl-cyanoacrylate, whereas the latter had more cohesive failures than did the butyl-cyanoacrylate.

Conclusions: Octyl-cyanoacrylate (Dermabond) tissue adhesive has a significantly higher wound bursting strength than butyl-cyanoacrylate (Histoacryl), and both perform better than Steri-Strips.

Reviewer's Comments: The use of these noninvasive wound closure materials is now commonplace. Traditionally, they have been used in areas with low skin tension, with sutures still preferred in high-tension closures. This study demonstrated that octyl-cyanoacrylate (Dermabond), in particular, had wound-bursting strength capable of secure closure of skin wounds in most high-tension areas. (Reviewer-Sterling R. Schow, DMD).

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Keywords: Trauma, Wound Bursting, Octyl-Cyanoacrylate, Butyl-Cyanoacrylate

Print Tag: Refer to original journal article

Porcine Collage Graft Useful in Ridge Extension

Use of a Porcine Collagen Matrix as an Alternative to Autogenous Tissue for Grafting Oral Soft Tissue Defects.

Herford AS, Akin L, et al:

J Oral Maxillofac Surg 2010; 68 (July): 1463-1470

A porcine collagen graft can substitute for autologous grafts in ridge extension surgery.

Objective: To study the clinical results and desirability of the use of a porcine collagen matrix as an alternative to soft-tissue autografts.

Design/Participants: Prospective study of 30 patients requiring soft-tissue grafting for bone coverage in the oral cavity.

Methods: 30 patients requiring soft tissue grafting to cover bone or periosteum in the oral cavity were selected for inclusion. Most patients were scheduled to undergo preprosthetic ridge extension surgery. A bilayer porcine collagen matrix called Mucograft was placed over the denuded bone at the time of surgery and was held in place by a prefabricated splint. The patients were followed up at 3 and 10 days, at 2, 3, 4, and 8 weeks, and at 3 months postoperatively. Measurements were taken of the vestibular depth and width at the 3-month interval.

Results: There was significant improvement in the vestibular depth and width in all patients. No infections and no graft dehiscences were noted. New epithelialized tissue formed over the graft in all cases, and the tissue was the appropriate keratinized or unkeratinized tissue that was indigenous to the site.

Conclusions: A bilayer porcine collagen matrix graft can substitute for an autograft in most cases of ridge extension preprosthetic surgery or in operations in which autogenous soft-tissue grafting intraorally are indicated.

Reviewer's Comments: Oral surgeons have long looked for a soft-tissue substitute for autologous graft material for intraoral procedures. It looks like this porcine matrix will, indeed, fit the bill. (Reviewer-Edwin D. Joy, Jr, DDS).

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Keywords: Grafts, Soft Tissue

Print Tag: Refer to original journal article

How Does Denervation of Zygomatic Branch of Facial Nerve Affect Lower Eyelid Surgery?

Evaluation of Subciliary Incision Used in Blowout Fracture Treatment: Pretarsal Flattening After Lower Eyelid Surgery.

Kim YK, Kim JW:

Plast Reconstr Surg 2010; 125 (May): 1479-1484

Expert and gentle soft-tissue management with careful attention to hemostasis is the key to decreasing complications with eyelid surgery.

Objective: (1) To objectively compare shape changes of the lower lid after a subciliary, skin-muscle flap approach to repair unilateral blow out fractures, and (2) to investigate the role of the zygomatic branch of the facial nerve in relation to adverse cosmetic postoperative changes.

Design: Case review.

Participants: 286 patients with a mean age of 35.6 years and no history of eyelid surgery. All patients presented for surgical correction of a unilateral orbital blow-out fracture.

Methods: A standardized subciliary approach picking up a skin-muscle flap, while preserving a 3- to 5-mm pretarsal muscle strip, was used by a single surgeon to approach all blow-out fractures in this study. The operated and nonoperated sides were compared after surgery for skin laxity using the snap test and the lid distraction test, as well as pretarsal shape utilizing photographs. Three plastic surgeons (group A) and 6 medical students (group B), blinded to the provided procedures, reviewed perceptible scar, pretarsal flattening, and lower eyelid malposition represented as ectropion or increased scleral show.

Results: After an average 28-month follow-up, 13 cases (4.5%) resulted in increased skin laxity at the operated site, 10 cases (3.5%) had perceptible scars identified by both groups A and B, 10 cases (3.5%) were identified by group A with pretarsal flattening versus only 8 cases (2.8%) noticed by group B, and scleral show or ectropion was noted in 9 cases by the plastic surgeons and in 8 cases by the medical students.

Conclusions: 7.3% of cases (21 of 286) resulted in complications. Given the complication rate in this particular study, the authors do not ascribe the complication frequency to the subciliary approach with a skin muscle flap, and believe it has little to do with pretarsal flattening.

Reviewer's Comments: Even the medical students could identify cosmetic shortcomings in this study! There was no demonstrable difference in the subjective postoperative complications as identified by both trained plastic and reconstructive surgeons, and by the medical students. The pretarsal flattening and lid retraction presumed to be secondary to denervation of the orbicularis oculi may be well founded given the medial side innervation of this muscle by the buccal branch of the facial nerve and its impairment after damage induced by Moh's surgery or dacryocystorhinostomy. The authors in this study do not consider traumatic etiology as a possible cause of decreased muscle tone in the periorbita, only noting that, preoperatively, "...an accurate assessment of the laxity on the fractured side was difficult." Comparing the posttraumatic approach after immediate resolution of edema with that of never-before injured or operated tissue as encountered in blepharoplasty is, perhaps, optimistic. (Reviewer-Michael L. Ellis, DDS).

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Keywords: Subciliary Incision, Pretarsal Flattening, Orbital Blow-Out Fracture

Print Tag: Refer to original journal article

Cone Beam CT 3-D Reconstruction Can Predict Soft-Tissue Changes After Surgery

Facial Soft Tissue Esthetic Predictions: Validation in Craniomaxillofacial Surgery With Cone Beam Computed Tomography Data.

Bianchi A, Muijldermans L, et al:

J Oral Maxillofac Surg 2010; 68 (July): 1471-1479

Three-dimensional reconstructs taken from cone beam computed tomography can be used to predict soft-tissue changes after orthognathic surgery, and the use of cone beam CT makes this technique economically feasible.

Objective: To validate new soft-tissue simulation computer software using data acquired by cone beam CT that makes it possible to predict final soft-tissue changes.

Design: Prospective study designed to test a computer software model for the prediction of surgical results.

Participants/Methods: 10 patients requiring orthognathic surgery were entered into the study. They had preoperative cone beam CT scans and conventional workup using cephalometric and panoramic x-rays. Three dimensional models were made using computer software. Photographs for mapping were also taken. The soft-tissue and bony changes were established using computerized virtual surgery. The surgery was then accomplished on the patients, and 6 months after surgery, the same records were repeated. The predicted soft-tissue changes done preoperatively were measured and statistically compared with the actual soft-tissue changes resulting from the surgery.

Results: Most of the soft-tissue changes that resulted from surgery were within the threshold of 2 mm established by the authors for reliability of the method. Those outlier changes that did not fit were changes in the lips and in the chin, which were not accurately predicted by the model.

Conclusions: Cone beam CT 3-dimensional reconstructions can be used with significant accuracy to predict soft-tissue facial changes after orthognathic surgery.

Reviewer's Comments: Orthognathic surgeons have long looked for some way to predict soft-tissue changes in the face after orthognathic surgery. With modern computer reconstructions, it appears that we are approaching the ability to do so, and the use of cone beam CT brings this technique into economic feasibility. (Reviewer-Edwin D. Joy, Jr, DDS).

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Keywords: Orthognathic Surgery, Diagnosis

Print Tag: Refer to original journal article

Oral Cancer in Young Patients -- Does Smoking and Drinking Affect Disease?

Never-Smokers, Never-Drinkers: Unique Clinical Subgroup of Young Patients With Head and Neck Squamous Cell Cancers.

Harris SL, Kimple RJ, et al:

Head Neck 2010; 32 (April): 499-503

In recent years, the incidence of head and neck squamous cell carcinoma has increased in younger patients, many of whom do not have the usual risk factors of tobacco or alcohol use.

Objective: To compare young head and neck squamous cell carcinoma patients who have a history of alcohol and tobacco abuse with a similar group of patients with similar lesions who did not abuse these substances.

Design: Comparative study of patient records and findings from new patients.

Participants: 78 patients between the ages of 18 and 39 years, all of whom had head and neck squamous cell carcinoma.

Methods: All patients included in the study had newly diagnosed and previously untreated squamous cell carcinoma of the oral cavity, oropharynx, hypopharynx, or larynx. Clinical and pathologic data were collected from the patients' charts. The patients were considered to be smokers if they had a current or past history of daily cigarette smoking. They were considered to be drinkers if they had a drink a day, on the average. Tumor recurrence was noted if a new tumor was found in a treated area. Recurrence and survival times were determined from the date of initial diagnosis to the date of recurrence diagnosis or death.

Results: There were 42 male and 36 female patients. Median follow-up was 42 months. Fifty patients had a history of current or prior alcohol and tobacco abuse, while 28 did not. Nonsmoking, nondrinking patients were diagnosed with carcinoma at a younger age (mean, 31.5 years) compared with smoking and drinking patients (mean, 35.5 years). Of the nonsmoking and nondrinking patients, 75% were female and 89% were white. These patients were also much more likely to have primary tumors involving the tongue. There was no significant difference between the 2 groups in the proportion of node-positive disease or relapse-free survival, which was 48% at 10 years. However, for 10-year overall survival, the nonsmoking, nondrinking patient survival rate was 71% compared to only 46% for the tobacco and alcohol abusers.

Conclusions: Young patients with head and neck squamous cell carcinoma have unique clinical profiles depending on their use or nonuse of alcohol and tobacco. Nonsmoking and nondrinking carcinoma patients are most likely to be white females with primary tongue lesions. Compared to smokers and drinkers with similar lesions, their relapse-free survival is not improved. Further research into the molecular profile of these young cancer patients is needed.

Reviewer's Comments: The incidence of head and neck squamous cell carcinoma in younger patients has been slowly increasing in spite of a decrease in cigarette smoking overall. Much research on this changing epidemiology has implicated the human papillomavirus (HPV) and its association with these tumors. HPV-associated tumor patients are usually younger, are less likely to smoke and drink, and have a nearly equivalent male-to-female ratio. They also appear to have a better response to treatment. (Reviewer-Sterling R. Schow, DMD).

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Keywords: Pathology, Immunology, Head and Neck, Squamous Cell Carcinoma

Print Tag: Refer to original journal article

Can Masseter Motor Nerve Improve Facial Paralysis?

Facial Animation With Free-Muscle Transfer Innervated by the Masseter Motor Nerve in Unilateral Facial Paralysis.

Bianchi B, Copelli C, et al:

J Oral Maxillofac Surg 2010; 68 (July): 1524-1529

Using the gracilis muscle innervated by the masseter motor nerve, facial paralysis can be corrected.

Objective: To evaluate the effectiveness of the masseter motor nerve in providing innervation to a muscle transfer for lower facial reanimation.

Design: A retrospective chart review of the records of patients who had surgery using a vascularized gracilis muscle transfer innervated by the masseter motor nerve.

Participants/Methods: 15 patients with unilateral facial paralysis underwent surgery for the correction of this condition. The gracilis muscle was taken from the leg along with its nerve, artery, and blood vessel and transferred to the affected side of the face. This transfer was done through a preauricular incision elevating a flap in the Superficial Muscular Aponeurotic System layer of the face. Only a small part of the muscle was actually taken and used. It was sutured to the commissure of the oral cavity and to the upper lip anteriorly and to the zygomatic fascia posteriorly. The motor nerve of the masseter muscle was then identified at the base of the dissection and anastomosed to the motor nerve of the muscle. The artery and vein from the muscle transfer was then anastomosed to the facial artery and vein in the surgical site. All patients had been videotaped and photographed preoperatively with attention to facial expression, oral motor function, and speech. In the 15 patients evaluated in this study, the masseter motor nerve was used for innervation in 8 patients, and a cross facial nerve graft was used in 7 patients. Reinnervation of the muscle took approximately 3.5 months. Postoperatively, all patients had smile training by the speech language pathologist.

Results: All patients in the masseteric nerve group had excellent results. In patients with difficulty controlling liquids before surgery, there was no spontaneous drooling afterward with adequate capability to control oral fluids. All patients were happy with the aesthetic and functional results and reported that their facial movement was a good representation of a smile.

Conclusions: The use of the masseteric nerve along with a gracilis muscle transfer can successively treat unilateral facial paralysis.

Reviewer's Comments: This very interesting paper shows a successful method of treating the challenging problem of unilateral facial paralysis. (Reviewer-Edwin D. Joy, Jr, DDS).

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Keywords: Grafts, Vascularized, Masseter Muscle Nerve, Facial Paralysis

Print Tag: Refer to original journal article

Maintaining Crestal Bone Around Implants

Peri-Implant Bone Level Around Implants With Platform-Switched Abutments.

Fickl S, Zuhr O, et al:

Int J Oral Maxillofac Implants 2010; 25 (May-June): 577-581

Shifting the microgap of the implant-abutment junction away from the outer edge of the implant and neighboring bone by platform shifting seems to limit crestal bone remodeling.

Objective: To determine if the crestal bone height around dental implants is affected by using a platform-switching protocol.

Design: Prospective clinical evaluation.

Participants: 36 patients who had multiple implants placed.

Methods: All patients were treated by the same surgeon; 5-mm diameter Osseotite Certain implants with an acid-etch surface and an internal connection were placed and covered with a 4.1-mm cover screw and then submerged. Control implants were Osseotite Certain 4-mm diameter internal connection fixtures. The control fixtures were also placed subcrestally and submerged with a 4.1 mm (regular diameter) cover screw. After a 3- to 6-month healing period, second-stage surgery and placement of an implant-supported provisional prosthesis was accomplished. Definitive prostheses were completed 3 months later. Marginal bone levels around each of the implants were evaluated radiographically at placement of the definitive restoration and 1 year later.

Results: The 5-mm diameter platform-switched implants (n=75) made up the test group. The control group included 14 of the regular-diameter fixtures. All the implants in both groups osseointegrated and were restored. All the patients completed the 1-year follow-up evaluation. For the platform-switched implants, the mean crestal bone loss at the time of definitive prosthesis insertion was 0.30 ± 0.07 mm. For the non-platform-switched implants, the crestal loss at this time was 0.68 ± 0.17 mm. By the 1-year follow-up, crestal loss was a mean of 0.39 ± 0.07 mm and 1.00 ± 0.22 mm for the platform-switched and non-switched fixtures, respectively. The differences between the groups were not statistically significant.

Conclusions: Platform switching appears to influence peri-implant crestal bone remodeling.

Reviewer's Comments: I did not like this paper and was surprised it made it past reviewers for publication. The comparisons were between implants of 2 different sizes that were placed differently with respect to the crestal bone. The results indicate that platform switching may help preserve crestal bone levels, but adequate comparisons and controls were not made in this study. (Reviewer-Sterling R. Schow, DMD).

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Keywords: Implants, Bone Level, Abutments

Print Tag: Refer to original journal article

Salvage Surgery Affects Survival in Recurrent Oral Cancer

Survival Analysis and Risk Factors for Recurrence in Oral Squamous Cell Carcinoma: Does Surgical Salvage Affect Outcome?

Sklenicka S, Gardiner S, et al:

J Oral Maxillofac Surg 2010; 68 (June): 1270-1275

When a recurrence occurs after surgical treatment of squamous cell carcinoma, salvage surgery can markedly increase survival, whereas radiation and chemotherapy alone have no effect.

Objective: (1) To review the outcomes and recurrence rates of oral squamous cell carcinoma by primary surgical resection with or without radiation or chemotherapy; (2) to identify factors that affect recurrence rates; and (3) to determine whether salvage surgery statistically affects survival of the patient.

Design: Retrospective review of the records of patients treated for squamous cell carcinoma of the oral cavity with surgery with or without adjunctive radiation or chemotherapy.

Participants/Methods: 155 patients with squamous cell carcinoma of the oral cavity were included. The size of the tumor, pathologic features of the tumor, presence of positive lymph nodes, patient age, gender, and time from original treatment to any recurrence were all evaluated. The type of treatment that the patient underwent (surgery alone, adjunctive chemotherapy, radiation, or both) was also evaluated. Whether there was a recurrence was measured, as was time to recurrence. Fifteen percent of the patients had a recurrence. The stage of the tumor, size, pathologic features, and whether radiation, radical neck dissection, or chemotherapy was used had no effect on recurrence. The stage of the tumor had a marked effect on survival of the patient, as did the histologic grade of the tumor and whether there were positive nodes. Patients who had recurrence were treated by surgery, radiation, or chemotherapy.

Results: There was a significant improvement in the survival of patients who had salvage surgery. No increase in survival was seen in patients who had radiation or chemotherapy alone as treatment for their recurrence.

Conclusions: Salvage surgery increases the survival in patients with recurrent oral squamous cell carcinoma; however, radiation or chemotherapy has no effect on survival.

Reviewer's Comments: This is an interesting study, although it suffers from the retrospective nature of the design and a relatively small number of patients. (Reviewer-Edwin D. Joy, Jr, DDS).

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Keywords: Oral Squamous Cell Carcinoma, Recurrence, Survival

Print Tag: Refer to original journal article

Is Bony Reconstruction Needed for Posterior Mandible Reconstruction?

A Prospective Analysis of Bony Versus Soft-Tissue Reconstruction for Posterior Mandibular Defects.

Hanasono MM, Zevallos JP, et al:

Plast Reconstr Surg 2010; 125 (May): 1413-1421

Successful selection of a mandibular microvascular reconstruction technique requires consideration of multiple factors, including the patient's comorbidities and anatomic limitations.

Objective: To prospectively compare vascularized bone flaps and soft-tissue free flaps utilized in posterior mandibular reconstruction.

Design: Prospective, nonrandomized study.

Participants: 74 consecutive patients requiring microvascular free flap reconstruction for posterior mandibular defects.

Methods: The surgeon's discretionary selection of the procedure (based on characteristics including extremity vascular status) resulted in 2 groups. After resections secondary to both malignant and nonmalignant disease, 24 patients received a vascularized free fibula osteocutaneous bone flap (VBF), and 50 patients received a soft-tissue free flap (STF) either from the rectus abdominis (n=3) or anterolateral thigh (n=47). The resections included at least the condyle and ramus to the mandibular angle. Standard data collected included age, tobacco use, comorbidities, radiation and chemotherapy treatment, defect and reconstruction specifics, hospital stay, and deviation and range of motion after reconstruction. ASA classification and the Kaplan-Feinstein medical comorbidity were both determined and recorded. Aesthetic outcomes and the level of disfigurement were evaluated as follows: preoperative and postoperative photographs of 36 patients were made (16 bone flaps and 20 soft-tissue flaps) for rating by 20 blinded observers. All data were subjected to multiple statistical analyses.

Results: Patients receiving the VBF averaged 47 years of age, and those receiving the STF averaged age 62 years. STF patients also exhibited a higher average ASA classification of 3.1 and had more comorbidities, compared to an ASA of 2.3 found in the VBF group. Larger and more anterior defects were treated more frequently by the VBF, whereas defects with complex soft-tissue deficits and significant extremity comorbidities were more often reconstructed with an STF. Differences in the total length of surgery, time in the ICU, and days in the hospital for both procedures were insignificant at levels less than $P=0.09$, as were the surgical complications at the donor and recipient site. Photographs assessed by plastic surgeons and laypersons revealed no significant difference in the grading of disfigurement between groups. The range of postoperative "crossbite" was greater for the STF (0 to 16 mm) than that measured in the VBF (0 to 6 mm). Range of motion was >39 mm in both groups.

Conclusions: The VBF, used here in a nonrandomized, younger, and healthier population in need of a larger reconstruction, fared better functionally than the STF when the amount of crossbite was compared. Most other outcomes were similar between the 2 techniques.

Reviewer's Comments: The authors of this paper note, and the photographs reflect, an ipsilateral open bite after reconstructions of both types. Their explanation of success is that the open bite "disappears on maximal jaw contraction." Other than these shortcomings (which include a nonrandomized method of group assignment and relatively short follow-up), the authors provide a nice review of the comparable outcomes inherent in these 2 successful, postablative reconstructive techniques. (Reviewer-Michael L. Ellis, DDS).

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Keywords: Reconstruction, Vascularized Bone Flap, Soft-Tissue Free-Flap

Print Tag: Refer to original journal article

GERD Common in TMD Patients

Prevalence of Temporomandibular Disorders in Patients With Gastroesophageal Reflux Disease: A Case-Controlled Study.

Gharaibeh TM, Jadallah K, Jadayel FA:

J Oral Maxillofac Surg 2010; 68 (July): 1560-1564

Many patients with gastroesophageal reflux disease, which has a high psychological component, also have temporomandibular dysfunction, which is closely related to environmental stress and depression.

Objective: To investigate the association between temporomandibular dysfunction (TMD) and gastroesophageal reflux disease (GERD) by assessing the prevalence of TMD in patients with GERD compared to a similar control group of GERD-free subjects.

Design: Prospective study of patients with a diagnosis of GERD seen in a gastroenterology clinic. The incidence of TMD in these patients was compared to that of a GERD-free control group.

Participants/Methods: 60 consecutive patients diagnosed with GERD by a gastroenterologist were entered into the study; 60 GERD-free subjects matched by gender and age were used as a control group. Patients in the study group were interviewed and examined for signs of stress and symptoms of TMD. The control group underwent the same evaluation.

Results: The GERD patients had more than twice the number of diagnoses of TMD than did the control group.

Conclusions: Patients with GERD also have the characteristics and, therefore, show the manifestation of temporomandibular disorder at twice the rate as a similar control group of patients who are GERD-free.

Reviewer's Comments: This is an interesting study and shows that patients with GERD should be advised by their gastroenterologist of the possibility of developing TMD, and patients with TMD should be advised of the possibility of developing GERD. (Reviewer-Edwin D. Joy, Jr, DDS).

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Keywords: TMD, GERD

Print Tag: Refer to original journal article

Submandibular Gland Tumors -- Evaluation and Treatment

Primary Tumors of the Submandibular Glands: A Retrospective Study Based on 41 Cases.

Ziglinas P, Arnold A, et al:

Oral Oncol 2010; 46 (April): 287-291

The preoperative assessment of submandibular gland tumors is difficult because of a lack of specific symptoms differentiating between benign and malignant lesions.

Objective: To review the preoperative assessment and treatment of submandibular gland neoplasms.

Design: Retrospective records review.

Participants: 41 patients with submandibular gland tumors.

Methods: Demographic data were compiled for each of the patients. Lesions were asymptomatic masses evaluated with fine-needle aspiration cytology in 33 instances, with CT scans in 12 patients, and with MRI for 12 patients. Ultrasound imaging was also performed for 6 lesions. Benign lesions were treated with excision of the gland. Malignant tumors were treated with combined modalities, three-fourths including a neck dissection and 16 with radiation therapy at 60 to 70 Gy. The mean follow-up time for patients with benign lesions was 5.1 years, and the mean follow-up time for patients with malignant lesions was 4.4 years.

Results: 21 patients had malignant tumors (usually adenoid cystic carcinoma [n=9]), 2 had mucoepidermoid tumors, 2 had squamous cell carcinomas, and 2 had salivary duct or adenocarcinomas. The average time between patient recognition of the tumor and first medical evaluation was 37 months for patients with benign tumors and 25 months for those with malignant lesions. Seventeen of the 20 benign tumors were pleomorphic adenomas. None of the benign tumors recurred. Five of the 21 patients with malignant tumors had a recurrence. The 2-, 5-, and 10-year survival rates of patients with a malignant tumor were 84%, 75%, and 36%, respectively. In the diagnostic process, 11 of 15 cases evaluated with fine-needle aspiration cytology were correctly identified. Clinical signs that developed with malignant lesions before diagnosis included pain, lymphadenopathy, pruritus in the submandibular region, and both lingual and hypoglossal nerve dysfunction.

Conclusions: The lack of symptoms with both benign and malignant tumors of the submandibular gland makes their diagnosis difficult. Benign tumors of the gland are effectively treated by surgical removal. Malignant tumors need to be treated aggressively, and a neck dissection is usually recommended. Adjuvant radiation therapy should be used with high-grade malignancies when resection margins are positive and when there is nodal metastasis.

Reviewer's Comments: Fortunately, tumors of the submandibular gland are not common. When they do occur, almost 50% are malignant, usually an adenoid cystic carcinoma. Differentiation between benign and malignant, based on history and clinical findings, is difficult. (Reviewer-Sterling R. Schow, DMD).

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Keywords: Pathology, Immunology, Submandibular Gland Tumors, Treatment

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Composite Grafts for Sinus Lifts With BioOss

Maxillary Sinus Augmentation With Autologous Bone Harvested From the Lateral Maxillary Wall Combined With Bovine-Derived Hydroxyapatite: Clinical and Histologic Observations.

de Vicente JC, Hernández-Vallejo G, et al:

Clin Oral Impl Res 2010; 21 (April): 430-438

A mixture of autologous bone taken from the lateral maxillary sinus wall and bovine hydroxyapatite can be successfully used for sinus lifts and subsequent implant support.

Objective: To evaluate the clinical efficacy of a mixture of autologous bone, harvested from the lateral wall of the maxillary sinus, with bone shavers and bovine-derived hydroxyapatite as a graft for sinus lifts.

Design: Prospective clinical and histologic study.

Participants: 34 patients.

Methods: The need for sinus floor elevation was made with panoramic radiographs, and for some patients, with a CT scan as well. The 34 patients, all with severe maxillary atrophy, had 12 sinus lift graft augmentation procedures. All surgeries were performed by the same surgeon using a lateral sinus wall approach. Autologous bone was harvested from the lateral sinus wall with a bone shaver until the wall was reduced to a thin layer. The remaining bone on the lateral wall was removed using a bur, and the sinus membrane was elevated. The area to be grafted was filled with a composite graft containing the harvested autologous bone and BioOss®. The amount of autologous bone ranged from 0.5 to 2 mL. After graft placement, a bioresorbable porcine-derived collagen membrane was placed over the lateral window. Implants (90) were placed after 9 months of graft consolidation in 32 cases. In the other patients, implants were able to be stably placed at the time of grafting. In the 14 patients whose implants were placed secondarily, a biopsy of the regenerated tissue was obtained using a 4-mm diameter trephine drill. All patients received a final fixed prosthesis. Patients were evaluated at 3- to 6-month intervals for 1 year and then annually.

Results: Mucosal tears occurred in 12% of the cases during grafting and either needed no treatment or were patched with a biodegradable membrane. One implant was lost. Histologic evaluation showed retained BioOss particles embedded in new bone. Newly formed bone was mature and compact. No inflammatory cells were seen around the residual BioOss particles. Newly formed bone made up 29% of the grafted area. Anorganic bovine bone made up approximately 21% of the graft volume and soft tissue made up approximately 50%.

Conclusions: Autologous bone harvested from the lateral maxillary wall mixed with a demineralized particulate bovine bone placed in sinus augmentations results in a predictable outcome. Newly regenerated bone in these grafts support implant osseointegration.

Reviewer's Comments: Another interesting, well-written paper attesting to the success of sinus lift procedures for implant placement. The choice of grafting material does not seem to be as important to bone regeneration as does its ability to maintain space while new bone is formed. (Reviewer-Sterling R. Schow, DMD).

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Keywords: Sinus Lift, Grafts, Autologous Bone, Bovine-Derived Hydroxyapatite

Print Tag: Refer to original journal article

How Does Mandibular Advancement Affect Airway Space?

Effects of Mandibular Advancement on Upper Airway Dimension and Collapsibility in Patients With Obstructive Sleep Apnea Using Dynamic Upper Airway Imaging During Sleep.

Choi J-K, Hur Y-K, et al:

Oral Surg Oral Med Oral Path Oral Radiol Endod 2010; 109 (May): 712-719

Mandibular advancement with a positioner device increases oropharyngeal diameter while decreasing collapsibility during midazolam-induced sleep.

Objective: To observe the effects of mandibular advancement with a dental protrusion appliance on oropharyngeal dimension and collapsibility in patients with obstructive sleep apnea (OSA).

Design: Prospective radiographic study.

Participants: 16 adults (13 males and 3 females) with mild to severe OSA.

Methods: All patients had completed polysomnographic evaluation of their OSA, had an adequate number of teeth to retain a mandibular positioning device, and had no evidence of temporomandibular joint disease. Silicone mandibular positioners were constructed on molar and premolar teeth to hold the mandible in its normal position and another to reposition the mandible to 67% of its maximum protruded position. Ultrafast CT imaging was used to evaluate changes in the upper airway during normal tidal ventilation during wakefulness and sleep in a supine position and then during midazolam-induced sleep in the same position. Cross-sectional areas of the airway in each mode were measured on the images with an automatic tracing device. Comparable tracings were made in the high retropalatal (HRP) region, the low retropalatal region (LRP), the high retroglossal area (HRG), and in the low retroglossal area (LRG).

Results: Mean minimum cross-sectional areas decreased 36.5%, 67.8%, 75.5%, and 65.8% at HRP, LRP, HRG, and LRG, retrospectively, when normal supine sleep airway dimensions were compared to awake dimensions in the same areas. When the mandible was advanced with the protruding appliance during sleep, the dimensions of HRP, LRP, HRG, and LRG increased 75.7%, 141.3%, 128.1%, and 119.9%, respectively. Oropharyngeal collapsibility indices during sleep at each level from highest to lowest increased 70.3%, 110.4%, 190.3%, and 156.9% during sleep but decreased 29.1%, 23.2%, 21.4%, and 34.1% when the mandible was advanced during sleep.

Conclusions: Mandibular advancement to approximately two-thirds of the maximum protrusion with a positioning appliance increases oropharyngeal dimension and decreases oropharyngeal collapsibility during induced sleep in many OSA patients.

Reviewer's Comments: Potential alterations in occlusion and the potential for joint disturbances make these appliances more acceptable for short-time use in diagnosis and treatment planning for bimaxillary surgery than for a permanent solution for OSA in my mind. The changes observed in this study are impressive, but no long-term follow-up documented compliance with long-term use or their effectiveness during sleep. (Reviewer-Sterling R. Schow, DMD).

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Keywords: OSA, Upper Airway, Mandibular Advancement

Print Tag: Refer to original journal article

We May Need to Reconsider Postoperative Monitoring for OSA Surgery Patients

The Early Postoperative Course of Surgical Sleep Apnea Patients.

Rotenberg B, Hu A, et al:

Laryngoscope 2010; 120 (May): 1063-1068

The incidence of significant respiratory events needing intervention in the early postoperative period after obstructive sleep apnea surgery is low.

Objective: To follow the early postoperative course of patients having surgery to treat obstructive sleep apnea (OSA).

Design: Prospective observational cohort study.

Participants: 121 patients with polysomnography proven OSA.

Methods: All patients had surgery by the same practitioner. Three separate categories of surgical intervention were considered as were combination procedures. Included were nasal septoplasties ± turbinectomies, palatal surgery to include uvulopalatopharyngoplasty (UPPP) with/without palatal flap or expansion sphincteroplasty, and radiofrequency tongue-base ablation. Each patient had a presurgical sleep study with at least a diagnosis of mild OSA within 6 months, as well as a preoperative Epworth Sleepiness Scale measurement. After surgery, all patients were monitored in a step-up care unit by nursing staff familiar with managing the respiratory complications of OSA surgery. Follow-up after surgery consisted of 4 hours in recovery, 20 hours in the step-up unit, and another 24 hours of monitoring on the ward. Oxygen saturations were continuously monitored and continuous positive airway pressure (CPAP) was started if apneic episodes or saturations below 90% over 10 seconds without self-correction were noted.

Results: The 199 patients ultimately included in the study had a mean preoperative apnea-hypopnea index of 31.6. The mean body mass index was 30.9, and the mean neck circumference was 39.6 cm. Forty-seven of the patients used CPAP. Regardless of the type surgery or combination of procedures performed, no surgical complications occurred. Nursing intervention in response to complications of the OSA surgery was rare. Only 3.4% of the patients had any OSA-related complications; all required CPAP for a time, and all had been previous CPAP users. These patients had also received multilevel surgeries.

Conclusions: The respiratory complication rate in the postoperative period for this group of OSA surgery patients was much lower than current protocol designs indicate. Decisions about the best level of postoperative monitoring needed for OSA surgery patients may need to be reconsidered.

Reviewer's Comments: Of course the papers' discussion covers different monitoring protocols and recommendations and considers the length of surgery, type of anesthetics used and analgesic requirement on postop complication potentials. For a fairly large sample size group, there were very few complications. (Reviewer-Sterling R. Schow, DMD).

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Keywords: OSA, Surgical Treatment, Postoperative Care

Print Tag: Refer to original journal article

Viable Option For Immediate Edentulous Arch Rehabilitation

Immediate Rehabilitation of the Edentulous Jaws With Full Fixed Protheses Supported by Four Implants: Interim Results of a Single Cohort Prospective Study.

Agliardi E, Panigatti S, et al:

Clin Oral Impl Res 2010; 21 (May): 459-465

Four anterior maxillary or mandibular axial and canted implants can be used to immediately support transitional and definitive fixed restorations if initial implant stability is adequate.

Objective: To evaluate, prospectively, the outcomes of immediately loaded full-arch fixed protheses supported by combinations of axillary and inclined implants in patients with edentulous jaws.

Design: Prospective clinical and radiographic evaluation, with up to 5 years of follow-up.

Participants: 173 edentulous patients.

Methods: Patients of any age and gender were included in the study. All had a need for extensive prosthetic rehabilitation. Radiographic screening was done with panoramic radiographs and CT. All surgeries were done by a single surgeon. All the patients were treated with an immediately loaded implant supported full fixed prosthesis supported by 4 implants in the mandible or maxilla. The implants placed in the intraforaminal area of the mandible or the anterior maxilla were either Brånemark System MKIV, Nobel Speedy Groovy, or Nobel Biocare AB fixtures. The distal implants were inclined approximately 30° posteriorly relative to the occlusal plane. Multiunit abutments were connected, and provisional protheses delivered. In the maxilla, the inclined implants were placed to just engage the anterior wall of the maxillary sinus. After initial follow-up visits, the patients were seen 6 and 12 months after restoration and then annually up to 5 years. At each follow-up, radiographs were taken to assess marginal bone levels.

Results: Final protheses were inserted 4 to 6 months after implant placement. A total 692 implants were placed. Mean patient age at surgery was 57.3 years. There were 72 maxillary and 101 mandibular full-arch protheses delivered, all supported by 4 implants. Eighty-nine percent of the patients have had their prosthesis in function at least 1 year. There were no surgical complications. Four axial implants in the maxilla and 1 tilted implant in the mandible failed within 6 months, but all were successfully replaced. The only prosthetic complication was fracture of the transitional acrylic prosthesis in about 15% of the cases. After 1 year of function, the average marginal bone loss was 0.9 ± 0.7 mm in the maxilla and 1.2 ± 0.9 mm in the mandible, with no significant differences between axial or tilted implants.

Conclusions: Combinations of axially placed and tilted implants can be used in both jaws for immediate rehabilitation with reduced morbidity and high patient satisfaction.

Reviewer's Comments: This technique continues to work very well for patients in our center. Usually, however, we tend to use 6 maxillary implants with the 4 anterior implants axially positioned. (Reviewer-Sterling R. Schow, DMD).

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Keywords: Implants, Edentulous Mandible/Maxilla, Immediate Loading, Tilted Implants

Print Tag: Refer to original journal article

Super Glue -- Is It Neurotoxic?

Cyanoacrylate in Nerve Repair: Transient Cytotoxic Effect.

Landegren T, Risling M, et al:

Int J Oral Maxillofac Surg 2010; 39 (July): 705-712

Epineural anastomosis with conventional microsuturing is the standard for nerve repair; however, cyanoacrylate may someday find its place as a reasonable complementary or alternative technique if neurotoxic effects can be minimized.

Objective: To evaluate the neurocellular toxicity of cyanoacrylate homologues and compare that of ethyl-cyanoacrylate (ECA) and butyl-cyanoacrylate (BCA).

Design: In vitro controlled study. **Materials:** This benchtop study compared 2 commonly available cyanoacrylates. Evobond® (ECA), a common household super glue, was compared against Histoacryl® (BCA), a surgical skin closure material, with regard to cytotoxicity.

Methods: Cultured neuroblastoma cells, SH-SY5Y, were plated and grown and then exposed to either ECA or BCA. A controlled culture medium provided moisture during the 5-second initial polymerization of the cyanoacrylates. Cell cultures unexposed to the cyanoacrylates were used as controls. Cell cultures were followed for 4 weeks, during which phase contrast microscopy was used to examine each culture well at 24 hours and at 1, 2, 3, and 4 weeks. Measurements of affected (cell-free zone of death or halo) culture areas were recorded. 51CR assay measured adhesive-induced cell death at 24 hours, at 1 week, and at 4 weeks. Cell morphology was analyzed with immunofluorescence, with representative cells examined from outside the halo. Data were subjected to appropriate statistical analyses.

Results: The cyanoacrylates created a circumferential zone of death, much like an antibiotic disk on a bacterial culture. The measurements of these "halos" resulted in a wider zone with the ECA group, though it was not statistically significant from that of the BCA group. Between days 7 and 14, the zone decreased in size with both groups and continued to become smaller over the next 2 weeks, representing cell recovery in this time period. The ECA halo disappeared as cell growth occurred back toward the margin of the ECA group. The BCA group decreased also, but continued to have a significantly wider halo than the ECA group at the end of the study. 51CR assays revealed no significant differences between each group's cell death at any time in the study, and no significant differences in cell morphology was noted with fluorescent phase contrast microscopy.

Conclusions: Over-the-counter super glue and surgical-grade cyanoacrylate performed without significant differences with regard to cell toxicity in this well controlled in vitro cell culture study. The authors conclude that toxicological evidence does not exist to infer preference for BCA over ECA for peripheral nerve repair.

Reviewer's Comments: Although the initial toxicity in both groups was similar, the authors report that the "cell-free zones," represented as halos around the cyanoacrylates in media, remained significantly wider at the end of the study in the BCA group. This excellent basic science article demonstrates well the characteristics and toxicity of ECA and BCA. Given the high contact angle and high viscosity of ECA, it is more easily applied and contained in a specific area than the less viscous BCA. Reducing the focus size, and thus volume, of cyanoacrylate for specific site administration intuitively reduces overall toxicity in a nerve repair application. (Reviewer-Michael L. Ellis, DDS).

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Keywords: Nerve Repair, Cyanoacrylate, Synthetic Adhesive, Cytotoxic, SH-SY5Y

Print Tag: Refer to original journal article

Comparing Neurosensory Deficit After BSSO vs DO

Evaluation of Alveolar Nerve Function After Surgical Lengthening of the Mandible by a Bilateral Sagittal Split Osteotomy or Distraction Osteogenesis.

Baas EM, de Lange J, Horsthuis RBG:

Int J Oral Maxillofac Surg 2010; 39 (June): 529-533

Condylar resorption, and thus relapse, is thought to be less with distraction osteogenesis than with bilateral sagittal split osteotomy, due to the gradual condylar loading.

Objective: To compare inferior alveolar nerve (IAN) function following mandibular advancement via bilateral sagittal split osteotomy (BSSO) versus distraction osteogenesis (DO), weighing the postoperative impairment group against those resulting in no neurosensory deficit.

Design: Retrospective cohort study.

Participants: 65 patients with completed mandibular advancements (30 with intraoral DO and 35 with BSSO).

Methods: The method of surgery included desires of the patient and parents, as well as surgeon recommendations. Careful BSSO or DO procedures were provided in a standard fashion, with well recognized surgical technique on all patients. IAN function was evaluated at least 1 year following surgery using pin prick and a 3.22 Semmes-Weinstein monofilament. A 75% correct response to pin prick and the monofilament, after 4 stimuli bilaterally, was scored as a positive response. Statistical analyses compared variables between groups, and regression analysis compared the proportion of the neurosensory impaired group with the unimpaired group to eliminate confounding variables.

Results: Nearly 18% of nerves (23/130) tested resulted in neurosensory deficit; 14 nerve deficits were from the BSSO group, resulting in 3 anesthetics and 11 paresthesias. Nine nerve deficits were observed in the DO group, resulting in 2 anesthetics. The mean age of those with IAN deficits was 33 years. Males were at equal risk compared to females, and young patients were no better off than the elderly. The mean age in the impaired group was higher due to the fact that the females in the study were significantly older. In the unimpaired group, BSSO procedures were utilized for 52% of the cases, and DO accounted for 48%. The mean magnitude of advancement was greater in the impaired group, particularly in females. As a whole, patients <25 years of age did not enjoy a protective reduction in risk secondary to age.

Conclusions: The logistic regression analysis in this study eliminated the age, gender, and advancement confounding variables and inferred no significant difference in neurosensory changes comparing BSSO and DO at 1 year following mandibular advancement.

Reviewer's Comments: Increased age and big advancements contribute to increased risk of IAN deficits, particularly in females as represented here. The BSSO intuitively engenders risk to the nerve over that of DO. The results, as presented in this study, are somewhat confounding in spite of the regression analysis. The authors admit that this study is underpowered and recognize the need for a prospective, randomized clinical trial. (Reviewer-Michael L. Ellis, DDS).

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Keywords: Mandibular Advancement, Distraction Osteogenesis, BSSO, Alveolar Nerve

Print Tag: Refer to original journal article

Postoperative Complaints May Predict Impairment After Tx of Mandibular Condyle Fx

Complaints Related to Mandibular Function Impairment After Closed Treatment of Fractures of the Mandibular Condyle.

Niezen ET, Bos RRM, et al:

Int J Oral Maxillofac Surg 2010; 39 (July): 660-665

Regaining the range of motion and maximal incisal opening is the key to success in the management of mandibular condyle fractures utilizing closed reduction.

Objective: To evaluate the association between patient complaints after closed treatment of condyle fractures and resultant functional mandibular impairment.

Design: Prospective cohort clinical study with a 1-year follow-up.

Participants: 114 Dutch speaking patients with at least 6 months of follow-up data, all devoid of psychiatric disorders, developmental disability, or temporomandibular disorder/myofascial pain dysfunction history, and all with a condyle fracture <1 week old.

Methods: Radiographic identification and scoring of dislocation of the condylar head (yes or no), displacement (grossly, not, or minor), capsular involvement (intra- vs extracapsular), and deviation of the fracture segment (yes or no) was accomplished. Stable occlusions following injury resulted in treatment by observation. Unstable occlusion or apertognathia >1.5 mm received arch bars and guiding elastics. Rigid fixation was not utilized in this study, and all arch bars were removed after 6 weeks. All were counseled regarding a soft diet with texture advancement following 3 weeks, and all patients were followed at 1, 3, 6, and 12 weeks following the initial event. Pain, decreased opening, joint sounds, and occlusal problems were queried at the first visit, and the patients were encouraged and reminded in a standardized fashion to return at 6 and 12 months. Follow-up examinations evaluated TMJ palpation to assess pain, maximal opening, excursive movements, and protrusion. Patients completed the 17-item Mandibular Function Impairment Questionnaire (MFIQ), which has a scoring range of 0 to 68, where zero represents no impairment. A visual analog scale (VAS) was utilized for pain intensity, and patients rated their occlusion. The SPSS statistical package was used to assess the factors associated with perceived impairment.

Results: 88 patients completed the 12-month follow-up period, and 26 completed 6 months. Condylar neck fractures were most frequent (50% of patients), and 75% of the fractures were sustained in a traffic accident. At the end of the follow-up period, occlusion was described as "good" by 76%, mean maximal opening was 51.9 mm, 9% experienced pain per the VAS, and 39% had a score ≥ 1 on the MFIQ (mean, 3.4). Absolute excursive movement differences were small. The chance of impairment increased when pain was present and decreased when maximal opening was larger (protective).

Conclusions: Pain, reduced opening, increased age, patient's perception of occlusion, and large differences in left and right excursive movements are indicators/predictors of risk for mandibular impairment following closed condylar fracture treatments.

Reviewer's Comments: The authors demonstrate the data in a very organized fashion, and the regression analysis math is well explained and expressed in an understandable and meaningful manner, enabling the reader to follow the calculations of the risk of mandibular impairment with a given set of example variables. This patient population must be rehabilitated aggressively with regard to function and maximum opening, accordingly, they will fare better postoperatively. (Reviewer-Michael L. Ellis, DDS).

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Keywords: Mandibular Condyle Fracture, Mandibular Function, Pain, Occlusion

Print Tag: Refer to original journal article

Postoperative Dosing of Ketoprofen Delays Pain Onset

Preemptive Effect of Ketoprofen on Postoperative Pain Following Third Molar Surgery. A Prospective, Randomized, Double-Blinded Clinical Trial.

Kaczmarzyk T, Wichlinski J, et al:

Int J Oral Maxillofac Surg 2010; 39 (July): 647-652

Ketoprofen provides a better analgesic effect when administered within 1 hour after surgery, as opposed to before surgery, and reduces the amount of analgesic rescue medicine required in the first 12 hours.

Objective: To determine the preemptive effects of oral ketoprofen when administered prior to third molar surgery versus a placebo or ketoprofen administered following third molar surgery.

Design: Randomized, prospective, double-blind clinical trial.

Participants: 100 healthy patients between 18 and 60 years of age presenting for removal of wisdom teeth requiring at least a partial bony impaction with bone removal.

Methods: A single oral surgeon provided extractions, with standardized surgical and local anesthesia regimens, to patients randomized into 3 groups: pre-treatment (pre-group); post-treatment (post-group); and no treatment (no-group). The pre-group received 100 mg oral ketoprofen 1 hour preoperatively and 1 hour postoperatively. The post-group received 100 mg oral placebo 1 hour preoperatively and 100 mg oral ketoprofen 1 hour postoperatively. The no-group got a placebo 1 hour before surgery and 1 hour after surgery. A visual analogue scale (VAS) from 0 to 100 mm, representing no pain to worst pain, was used for patient measurements at hourly intervals over 12 hours. The first 2 pain episodes requiring a rescue medication, as well as total rescue analgesic use, and the number of patients without this need were all recorded. Multiple statistical analyses were used to examine all data within and between groups, and a *P* value of <0.05 was significant in this study.

Results: 96 patients completed the study, with no age, gender, time of surgery, or VAS significance noted at baseline. A significant difference in the VAS was noted between groups between the fourth and twelfth hours after surgery, and interventions significantly affected pain sensation in the twelfth hour with respect to time, the effect of group, and group related to time. The time to the first rescue medication was statistically significant between groups, as was the VAS score at the time the rescue medication was required. The second rescue medication time and VAS scores at that time were not significant between groups. The groups differed significantly with regard to total analgesic intake, particularly with the pre/no groups and post/no groups. Importantly, the groups differed significantly when evaluating the number of patients in each group not needing any analgesia outside the original study dose: the pre/no groups and post/no groups were identified as significantly different, whereas the pre/post groups showed no significant difference.

Conclusions: This study suggests that postoperative dosing of ketoprofen delays the onset of pain, lessens the pain intensity, and lessens the need for rescue medications when compared to preoperative dosing or a placebo, and the results may be due to the half-life and rapid onset of ketoprofen, peaking at 60 to 90 minutes, while the local anesthetic was effective.

Reviewer's Comments: Considering the nonsteroidal anti-inflammatory drug half-life and time titrating it to action at the time of maximum prostaglandin production secondary to tissue insult (60 minutes postoperative) is a good method of reducing nociceptive response and thus postoperative discomfort. The authors nicely review basic pain science in this study. (Reviewer-Michael L. Ellis, DDS).

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Keywords: Preemptive Analgesia, Ketoprofen, Third Molar Surgery, Pain, VAS

Print Tag: Refer to original journal article

DO and CO Surgery Have Comparable Outcomes in CLP Patients

Maxillary Distraction Versus Orthognathic Surgery in Cleft Lip and Palate Patients: Effects on Speech and Velopharyngeal Function.

Chua HDP, Whitehill TL, et al:

Int J Oral Maxillofac Surg 2010; 39 (July): 633-640

Moderate maxillary advancement in the cleft lip and palate patient may be accomplished by either distraction osteogenesis or conventional orthognathic surgery with comparable effects on speech and velopharyngeal function.

Objective: To compare the effects of distraction osteogenesis (DO) and conventional orthognathic surgery (CO) in cleft lip and palate (CLP) patients with regard to speech and velopharyngeal function (VF).

Design: Clinical, randomized controlled trial.

Participants: 21 nonsyndromic CLP patients requiring a 4- to 10-mm advancement of the maxilla, along with mandibular procedures if indicated.

Methods: After completion of necessary grafting and orthodontic procedures, the CO group (n=25) completed standard Le Fort 1 advancement with segmentalization (if indicated) and bone plate and screw fixation, and the DO group (n=22) had standard bone cuts and mobilization with internal distractors applied and tested prior to closure. All surgeries were accomplished by the same surgeon. The DO group, following 3 days of latency, was then advanced at 1 mm per day until the desired maxillary position was accomplished. Speech and VF changes were assessed preoperatively with nasoendoscopy and at 3, 12, and 24 months postoperatively by a single investigator. A 3- to 5-minute standardized speech sample was obtained at each examination. For diagnosis, VF was classified and described for VF movement, consistency, and pattern of closure following multiple examiners blinded and randomized video evaluation. Resonance, nasal emission, and articulation were recorded during an exam by a speech pathologist, and the recordings were randomized and then rated by consensus of 2 speech pathologists. A nasometer measured nasal and oral acoustic energy via a headset and 2 microphones, and a ratio of these measurements was expressed in a percentage as nasalance.

Results: 16 CO and 11 DO patients completed the nasoendoscopy, with the remainder refusing the assessment. Statistically, there was no significant difference in the 2 groups with respect to VF outcomes described as "improvement," "deterioration," and "no change." Additionally, there was no correlation with regard to amount of advancement and VF. Eleven DO patients and 11 CO patients completed resonance analysis, with 2 of the DO patients exhibiting preoperative and postoperative hypernasality, and 4 of the CO patients demonstrating hypernasality postoperatively. Overall, the hypernasality was not statistically significant in or between the 2 groups, and the amount of advancement showed no correlation to resonance.

Measurements of nasal emission and nasalance showed no statistical significance or correlations with advancement, surgical technique, or VF.

Conclusions: Conventional orthognathic surgery and DO result in comparable outcomes when considering VF and speech disturbance measures in a population of CLP patients.

Reviewer's Comments: Presurgical counseling for those with CLP deformities should certainly include a discussion of velopharyngeal insufficiency and possible speech changes. The authors point out that adaptive mechanisms of the velopharyngeal anatomy are variable and unpredictable, no matter the surgical technique selected. (Reviewer-Michael L. Ellis, DDS).

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Keywords: Distraction, Orthognathic Surgery, Cleft, Speech, Velopharyngeal Function

Print Tag: Refer to original journal article