Consider the connotations of the words being used, and treat your patients with courtesy and respect.

The second part of this presentation continues the discussion about communication and the importance of using appropriate words. Consider the connotations of the words being used. For example, instead of referring to a "recall" appointment, consider "follow-up visit." Recall brings to mind something that is defective. When someone is not available, it is not necessary to say that the person is "out to lunch" or "not here." Simply say that the person is "not available" and then ask to take a message. Also, consider overly used terms such as "I'll squeeze you in." It is much nicer to say "I'd like to find a place for you." One of most frustrating words to patients may be the word "policy." Rather than saying, "This is our policy," try something like, "This works best for us." Great communication is a learned trade. Be patient with yourself and keep practicing. There are a multitude of books on communication as well as CDs and DVDs. Although there are many courses we could take to help improve our communication skills, the best teacher is still practice, practice, and more practice.

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Keywords: Communication, Image, Terminology

Print Tag: Refer to original journal article
The subjective perception of dental aesthetics in adolescents is influenced by malocclusion.

**Background:** In the past, a major reason for performing orthodontic treatment was to enhance occlusion. Improvement in dental aesthetics has always been a positive outcome of orthodontic treatment, but how important is aesthetics to adolescent patients? Do teenagers actually perceive that aesthetics affects their oral health-related quality of life?

**Objective:** To investigate the effect of malocclusion and self-image on the psychosocial impacts and quality-of-life issues in adolescent patients.

**Design/Participants:** This cross-sectional study evaluated a sample of 301 adolescent subjects, with an average age of 16 years. Approximately 40% of the subjects were male, and 60% were female.

**Methods:** Several different questionnaires were given to each of these subjects. In addition, patients were examined to determine their malocclusion and their Dental Aesthetic Index (DAI). The authors used the questionnaires to determine if there was a correlation between adolescents' self-perceived variables and their need for orthodontic treatment.

**Results:** Although most students had no treatment need, at least 1 oral impact on quality of life was reported by 88% of the adolescents, and 98% of subjects showed some level of psychosocial impact of dental aesthetics. The authors clearly showed that overall scores on the psychosocial impact of the dental aesthetics scale were higher with subjects who had a higher DAI score. These results confirmed the view that adolescents attribute high importance to an attractive dental appearance.

**Conclusions:** Subjective self-perception of dental aesthetics in adolescents is influenced by occlusal conditions, oral health-related quality of life, and self-image.

**Reviewer's Comments:** I like this study. After practicing clinical orthodontics for many years, it has also been my impression that young people today regard dental aesthetics as an important factor in their physical appearance. It is perhaps much more important to them than the way their teeth occlude. (Reviewer-Vincent G. Kokich, DDS, MSD).

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Keywords: Dental Aesthetics, Adolescents, Quality of Life

Print Tag: Refer to original journal article
There is no valid evidence that performing articulator mountings improves a patient's stomatognathic health.

Background: There is a segment of orthodontists and general practitioners who believe strongly in the orthodontic gnathologic concept requiring that all cases be mounted on articulator. Will mounting all cases improve orthodontic diagnosis and treatment planning? Regardless of whether you believe in routinely mounting cases, you should know the answer to this question.

Design/Objective: The purpose of this literature review article was to dispel and debunk 10 myths of orthodontic gnathology. Review: Some of the myths addressed in this article include the concepts that occlusion and condyle position are the primary causes of TMD and that orthodontic treatment causes TMD. The authors also note that the modern view of TMD treatment is no longer gnathological or dental based, and the current evidence-based view of TMD treatment is now a biopsychosocial model. There is also no basis to the concepts that asymptomatic subjects with internal derangement need treatment and that as many as 30% of TMD asymptomatic subjects have internal derangement. Evidence-based treatment would suggest that there is no need to treat these patients because they are TMJ asymptomatic. The authors also note that the concept of centric relation (CR) has been defined in so many different ways that it would be difficult to prove that any CR position is correct for all patients. Additionally, the ability to accurately reproduce mountings is questionable.

Conclusions: It is time to reconsider the validity of the age-old ideas of orthodontic gnathology that are based on rhetoric, blind faith, art, emotionalism, and practice management rather than on science and evidence. Reviewer's Comments: This is an excellent article that should be read by all orthodontists and shared with their referring dentists. I have seen more harm done to patients in an effort to treat them to some ideal CR position or occlusal scheme than almost anything else. If you do not routinely mount your cases on articulators, you will find support in this article. If you do routinely mount your cases, it is probably even more important for you to read this article. (Reviewer-John S. Casko, DDS, MS, PhD).

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Keywords: Orthodontic Gnathology Myths

Print Tag: Refer to original journal article
The author demonstrates successful Class II treatment using a combination of MARA for A-P correction and Invisalign for alignment and space closure.

**Background:** Treatment of significant A-P problems with clear aligner treatment has been difficult due to the lack of interarch control.

**Objective:** To describe a technique for using a Mandibular Anterior Repositioning Appliance (MARA) followed by Invisalign treatment for the correction of a Class II, division 1 malocclusion in an adolescent.

**Design:** Technique description and case report.

**Participants:** The case report involved a 13-year-old boy with a Class II deep bite malocclusion. **Discussion:** Although it is sometimes possible to proceed with the clear aligner treatment at the same time as the MARA, difficulty in wearing the lower aligner with the lingual arch makes sequential treatment more predictable. The MARA is used for growth modification and dental movement for an initial period of 12 to 15 months. After removal of the MARA and after approximately 3 months of settling, the Invisalign treatment is planned, and the aligner sequence is started.

**Results:** The case report demonstrated the Class II correction and alignment on a 13-year-old boy with sufficient dental eruption to allow good engagement with clear aligners. During the 15 months of initial MARA treatment, there was a headgear effect on the upper arch, along with downward and forward mandibular growth. After 3 months of settling, an additional 12 months of Invisalign treatment resulted in good alignment and interdigitation but a slight undercorrection of lower incisor rotations and somewhat upright upper incisors.

**Conclusions:** Combination MARA and aligner treatment allows correction of some Class II problems, but complete rotation correction and incisor torque control are still a challenge.

**Reviewer's Comments:** This seems to be a better solution for Class II correction with aligners than with the use of elastics. The MARA offers A-P correction in a growing patient with little cooperation required. The sequential treatment may take more time but offers the advantage of doing the Invisalign planning with the A-P already corrected. This case report demonstrates that finishing cases with complete rotation correction and proper incisor torque is still a challenge when using clear aligners, even if the Class II malocclusion is corrected. (Reviewer-Brent E. Larson, DDS, MS).

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Keywords: Invisalign, MARA, Class II

Print Tag: Refer to original journal article
Removal of orthodontic appliances results in a significant decrease in the number of periodontal pathogenic bacteria.

**Background:** Today, orthodontists treat more adults than in years past. Some of these adults are susceptible to periodontal disease. In order to have periodontal breakdown, specific periodontal pathogenic bacteria must be present. Is there a reduction in the frequency of these bacteria during and after orthodontic treatment?

**Objective:** To evaluate any changes that occurred in the subgingival microbiota after removal of fixed orthodontic appliances.

**Design/Methods:** This clinical study evaluated the presence of periodontal pathogens in a sample of 30 young adults. The average age of the subjects was 20 years. The sample was divided into 11 males and 19 females.

**Methods:** All subjects had orthodontic appliances in place with bands on the molars and brackets on the remaining teeth. Bacteriologic evaluations were made from the gingival sulcus around the maxillary and mandibular molars and maxillary and mandibular central incisors. These samplings were then assessed using DNA methods to determine which type of bacteria was present. Next, the orthodontic appliances were removed. Three months later, the same assessment of the periodontal bacteria was made for each of these 4 regions. The authors compared results during and after treatment to determine if the frequency of periodontal bacteria had changed.

**Results:** There was a significant reduction in the frequency of periodontal pathogens after orthodontic appliance removal.

**Conclusions:** Periodontal pathogenic bacteria present during orthodontic treatment are significantly reduced within 3 months of appliance removal.

**Reviewer's Comments:** This is important information for orthodontists. In some of our adult patients, periodontal disease can develop and worsen during orthodontic treatment. Perhaps in some of these cases, in order to reduce the potential for bone loss, it may be best to remove orthodontic appliances for 3 to 6 months in order to get the disease under control, and then proceed with rebracketing of the teeth. This study has shown that simply by removing the appliances, the numbers of bacteria are reduced significantly. (Reviewer-Vincent G. Kokich, DDS, MSD).

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Keywords: Periodontal Bacteria, Fixed Appliances

Print Tag: Refer to original journal article
Maxillary expansion in the primary dentition appears to normalize facial symmetry and palatal volume in children with unilateral posterior cross-bite.

**Background:** The ideal timing of treatment for unilateral posterior cross-bite (CB) is unclear.

**Objective:** To measure the facial asymmetry and palatal volume in a group of subjects with unilateral posterior CB treated in the primary dentition and compare them to an age-matched control group.

**Design:** Prospective clinical trial with controls.

**Participants:** 30 children (age, 4.9 years) with unilateral posterior CB and 28 children of similar age without malocclusion.

**Methods:** 3-D facial laser scans were done of each subject before expansion and 6 months later. Scans of the control subjects were performed at similar times. Laser scans were also done of maxillary dental casts before and after treatment to determine palatal volume. Facial asymmetry was measured by comparing the laser scan to a mirrored ideal, and the asymmetry was measured in the upper, middle, and lower face. The facial asymmetry of the CB children was compared to that of controls before and after expansion. Palatal volumes were compared in a similar manner.

**Interventions:** All CB children had a fixed acrylic expander in place for 2 months, with the same device worn as a removable retainer for an additional 2 months.

**Results:** Before expansion, the CB group showed greater asymmetry than controls in the lower face, but no differences in the upper or middle face. After expansion, there was no difference in asymmetry between groups. The palatal volume was less in the CB children prior to treatment, but was similar to that of controls after treatment.

**Conclusions:** Maxillary expansion in the primary dentition appears to normalize facial symmetry and palatal volume in children with unilateral posterior CB.

**Reviewer’s Comments:** This is certainly positive evidence that expansion treatment in the primary dentition helps improve facial symmetry. One challenge is that this study does not compare treatment in the primary dentition to treatment provided in the mixed dentition, a time when many CBs are corrected. Therefore, we do not know whether similar results would be obtained at a later stage after the incisors are erupted. The authors also acknowledge that long-term follow-up would be beneficial to see if the short-term benefits measured in this study are lasting. (Reviewer-Brent E. Larson, DDS, MS).

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**Keywords:** Posterior Cross-Bite, Early Treatment, Maxillary Expansion, Asymmetry

Print Tag: Refer to original journal article
Condylar morphology is significantly correlated with higher or lower occlusal force values.

**Background:** Some patients tend to clench or brux their teeth. This produces forces on the occlusion, but also produces a force on the mandibular condyle against the skull. Does this application of force cause alteration in condylar morphology?

**Objective:** To estimate mandibular condyle morphology in detail and to investigate the clinical relationship between occlusal force and mandibular condyle morphology using 3-D imaging.

**Design/Participants:** This prospective trial evaluated the relationship between occlusal force and condylar morphology in 40 female patients with malocclusion. The sample consisted of 16 patients with Angle Class I malocclusion, 13 patients with Angle Class II malocclusion, and 11 patients with Angle Class III malocclusion.

**Methods:** In each of these subjects, the occlusal force was evaluated with the Dental Occlusion Pressuregraph. The occlusal force was calculated 3 times for each individual. Next, the sample was divided into 2 groups: the high-force and the low-force groups. The 3-D cone-beam images were made of the condyles of each of these subjects in the frontal plane and sagittal plane. These condyles were then measured and traced to determine their morphology 3-dimensionally. The high-force and low-force groups were compared relative to condylar morphology.

**Results:** The long axis length and the radii of the condyle in the axial plane, as well as the radius in the frontal plane, were all significantly correlated with occlusal force. Certain measurements of the radius in the frontal plane were not significantly correlated with occlusal force.

**Conclusions:** Occlusal force, in general, is correlated with long axis length and the lateral and posterior radii of the mandibular condyles.

**Reviewer's Comments:** I enjoyed this study and believe that the authors’ methodology was satisfactory. The depiction of the change in force was interesting, especially since it was evaluated in a 3-D manner using cone-beam technology. (Reviewer-Vincent G. Kokich, DDS, MSD).

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Keywords: Occlusal Force, Condyle Morphology

Print Tag: Refer to original journal article
When used for SME to correct PXB, there is no difference in long-term stability when comparing the Haas appliance, the hyrax appliance, and the quad-helix appliance.

**Background:** The Haas appliance, the hyrax appliance, and the quad-helix appliance are all commonly used to correct posterior cross-bites (PXB) by expanding the maxillary arch. When used for slow maxillary expansion (SME) at a rate of 1 turn or 0.25 mm every other day, is there a difference in long-term stability when these 3 appliances are compared? Because you have a choice of using each of these 3 appliances, this is important information to know.

**Objective:** To evaluate the short- and long-term effects of SME with the Haas, hyrax, and quad-helix appliances on PXB correction stability.

**Participants:** The sample for this study consisted of 160 patients with PXB who were treated with the Haas, hyrax, or quad-helix appliance to expand the maxillary arch. **Intervention:** The subjects in this study were divided into 3 groups of individuals who were treated with the Haas appliance, the hyrax appliance, or the quad-helix appliance to expand the maxillary arch. Study models were taken prior to expansion, after expansion, and at least 2 years following expansion. The long-term expansion stability for each of the groups was then compared statistically.

**Results:** PXB expansion using SME had a stability rate of 84%, and there was no difference when the Haas, hyrax, or quad-helix appliances were compared. Long-term stability was slightly improved for patients who were treated earlier versus later in the mixed dentition and for patients who wore a removable retainer after active expansion.

**Conclusions:** When SME is used to correct PXBs, it has good long-term stability.

**Reviewer’s Comments:** I was impressed by the results of this study, although I was somewhat surprised that there was no difference when the quad-helix appliance was compared to the 2 other jack screw appliances. Although this study would have been improved by having a sample of patients who had rapid maxillary expansion when compared with stability rates reported in other studies for rapid maxillary expansion, the results of SME in this study are impressive. I should note that the average age of the patients at the three different stages of treatment were 8, 9 and 13 years, respectively. (Reviewer-John S. Casko, DDS, MS, PhD).

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Keywords: Slow Maxillary Expansion, Appliances, Tx Response, Stability

Print Tag: Refer to original journal article
What Factors Affect Image Quality of CBCT Images?

The Influence of Body Mass Index, Age, Implants, and Dental Restorations on Image Quality of Cone Beam Computed Tomography.

Ritter L, Mischkowski RA, et al:


In this retrospective study, BMI and gender do not appear to affect CBCT image quality, but dental restorations and age do.

**Background:** The effect that age, gender, body mass index (BMI) and dental restorations have on cone beam CT (CBCT) image quality is not known. Defining these factors could result in recommendations for adjustment of exposure parameters to optimize image quality.

**Objective:** To investigate the effect that age, gender, BMI, and dental restorations have on the subjective quality of CBCT images.

**Design:** Retrospective study using existing CBCT images. **Material:** 50 CBCT images taken on subjects of different ages, genders, and a variety of BMIs and dental restorations.

**Methods:** All images were subjectively scored by 4 different experienced practitioners. The images were rated for exposure quality, ability to visualize 6 anatomic structures, ease of seeing pathology, and apparent artifacts. These ratings were compared to data about the individual's age, gender, BMI, and dental restorations.

**Interventions:** All images were taken using standard exposure settings on a Sirona Galileos machine.

**Results:** The patient's gender and BMI did not have any apparent relationship to perceived image quality or readability. The image quality tended to decrease as the subject's age increased and as the presence of dental restorations increased. The ability to see certain anatomic structures, such as the nasal floor or mental foramen, was decreased by age, but not affected by restorations.

**Conclusions:** Gender and BMI do not appear to affect image quality of CBCT images of the dentofacial area. Image quality does seem to decrease with increasing age, perhaps due to decreased cortical bone thickness.

**Reviewer's Comments:** The conclusions of this study were not specific enough to determine specific exposure adjustments for certain situations, such as imaging of older patients. We now know that increasing age may negatively affect image quality, but we do not know if a specific exposure adjustment could compensate. It is encouraging that BMI did not affect image quality, because there have been studies indicating a negative effect on CT images of other parts of the body. (Reviewer-Brent E. Larson, DDS, MS).

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Keywords: CBCT, Image Quality

Print Tag: Refer to original journal article
The author concludes that their study shows a significant improvement in alterations of the condyle on the panoramic radiograph and a trend toward normalization of the posterior rotation of the mandible. 

Reviewer's Comments: Patients with JIA and involvement of the condyle are typically referred to an orthodontist due to the significant effect on mandibular growth along with posterior rotation of the chin and an increase of the mandibular plane angle. The information contained in the article about the improvement in long-term outcome was valuable. It is good for orthodontists to know that the severity of the disease diminishes with time, so that planning of surgical correction in these patients should probably wait until the disease has subsided so that the appropriate decisions regarding eventual jaw position can be made more appropriately. (Reviewer-Vincent G. Kokich, DDS, MSD).
Implementing a staff bonus plan based on practice productivity and collections may be a way to effectively reduce variable overhead in a down economy.

**Background:** A recent survey by the American Dental Association indicates that most dentists experienced a drop in performance in the fourth quarter of 2008 compared with the third quarter. Strategically looking at the overhead expenses in your practice can be 1 way to reduce the negative effects of the down economy on your practice.

**Design/Objective:** The purpose of this guest presentation article was to discuss a strategic approach to overhead control in your practice.

**Results:** A recent survey by the American Dental Association indicates that most dentists experienced a drop in performance in the fourth quarter of 2008 compared with the third quarter. If the downturn in the economy is affecting your practice negatively, you basically have 2 things that you can do. One is to reduce fixed overhead and the other is to reduce variable overhead. Because reducing fixed overhead can be difficult, reducing variable overhead appears to offer more opportunity. In this article Dr. Levin presents a number of questions that can be asked to help you decide which areas of variable overhead can be appropriately reduced. He strongly warns, however, that taking wholesale cost cutting measures to reduce overhead will likely have a long-term negative effect on your practice.

**Conclusions:** While it is tempting to engage in wholesale cost cutting to reduce variable overhead during a down economy, before doing this, you should carefully consider the long-term effects on your practice.

**Reviewer’s Comments:** Given the current state of our economy, this was a very timely article. Although it was directed primarily at general dentists, the principles discussed by Dr. Levin apply equally to an orthodontic practice. While it is difficult to experience a decrease in net income as a result of the depressed economy, it is important to very carefully evaluate which expenses in your practice can be reduced without having a long-term negative effect on patient care and satisfaction. (Reviewer-John S. Casko, DDS, MS, PhD).

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Keywords: Controlling Overhead, Down Economy

Print Tag: Refer to original journal article
Is There a Link Between Sucking Habits, Posterior Cross-Bite in Young Children?

Prevalence of a Posterior Crossbite and Sucking Habits in Brazilian Children Aged 18-59 Months.

Bandeira Macena MC, Tornisiello Katz CR, Rosenblatt A:

Eur J Orthod 2009; 31 (August): 357-361

In this study from Brazil, >40% of children up to age 5 years engaged in thumb, finger, or pacifier sucking, but only 10% had evidence of a posterior cross-bite.

**Background:** Non-nutritive sucking habits are common among children in many countries, and their possible role in the development of posterior cross-bites needs further investigation.

**Objective:** To determine the prevalence of sucking habits and posterior cross-bites in a representative sample of Brazilian children from 18 months to 5 years of age.

**Design:** Large scale, epidemiologic study.

**Participants:** 2750 Brazilian children from age 18 months to 5 years whose parent agreed to participation as part of an immunization program.

**Methods:** The parent or guardian of each child was interviewed to obtain information about age, gender, and the presence of a sucking habit. A clinical examination was completed by trained dental students who recorded the presence and location of any posterior cross-bite.

**Results:** Overall, 43.5% of the children engaged in a finger-, thumb-, or pacifier- sucking habit, with the pacifier much more common. Ten percent of the entire sample demonstrated a posterior cross-bite, with the percentage increasing with age. An association was detected between cross-bite and a pacifier-sucking habit (OR, 1.46), meaning that the chance of having a cross-bite went up approximately 50% if a pacifier habit was present.

**Conclusions:** There was a high prevalence of non-nutritive sucking habits in this sample of young children, but <1 in 4 with a sucking habit developed a posterior cross-bite.

**Reviewer’s Comments:** This study was not designed to determine a cause and effect relationship between sucking habits and posterior cross-bite, but rather to see if the two were associated. The weak association discovered indicates that the sucking habits may increase the risk of developing a posterior cross-bite, but that other factors are more important. The authors suggest that genetics and respiratory function may be 2 of the other factors involved. (Reviewer-Brent E. Larson, DDS, MS).

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Keywords: Cross-Bite, Thumb Sucking, Pacifiers, Genetics

Print Tag: Refer to original journal article
This paper reports on 140 subjects who had surgical correction of protruding ears. Most procedures were done under local anesthesia and only minor complications were noted.

**Background:** Treatment of overall facial aesthetics can sometimes involve correction of excessive protrusion of the ears.

**Objective:** To provide a technique overview and case series of surgical treatment for prominent ears.

**Design:** Technique description and case series review.

**Participants:** 140 subjects, who had surgical correction of prominent ears by the primary author, were included. There were twice as many females as males, and the average age was 25 years.

**Methods:** All 140 cases were reviewed to determine the age, gender, surgical side, complications, and results. A follow-up telephone survey was conducted to determine patient satisfaction. Descriptive statistics were used to summarize results.

**Interventions:** Subjects had an incision made on the posterior surface of the ear for access. The cartilage was abraded and reshaped to the desired form. The ear was initially held in position by sutures until scarification occurred for permanent positioning.

**Results:** 95% of the patients had bilateral correction, and a few had unilateral revision of previous surgery. Eighty percent of the subjects had the operation under local anesthesia only, while 13% had general anesthesia because of other procedures being done at the same time. No serious complications, such as hematomas or infections, were noted in this sample. The minor complications recorded were mostly related to suture extrusion or granulation, and 2 subjects had residual asymmetry. The telephone survey was completed by approximately 60% of the subjects, and 90% of those were satisfied with the results and thought their ears had been corrected.

**Conclusions:** Surgical correction of prominent ears is a relatively low-risk procedure with high patient satisfaction ratings.

**Reviewer's Comments:** As orthodontists and surgeons use facial aesthetics to plan optimal treatment, there are sometimes issues outside the normal bounds of our treatment zone that affect appearance; the ears can be one of those issues. This article informs us that there are techniques available to address prominent ears if necessary. The surgery described in this paper is attractive because, if desired, it can be done under local anesthesia, it has few complications, and most importantly, patients are generally very satisfied with the results. (Reviewer-Brent E. Larson, DDS, MS).

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Keywords: Aesthetics, Prominent Ears, Surgery

Print Tag: Refer to original journal article
In a group of 29 mild-to-moderate sleep apnea patients, a reduction in blood pressure was seen at 3 months, and this reduction was maintained at the 3-year follow-up.

**Background:** Treatment of obstructive sleep apnea (OSA) with continuous positive airway pressure (CPAP) improves blood pressure, but it is unknown whether oral appliances have the same positive effect.

**Objective:** To measure the change in blood pressure in a group of OSA patients treated with oral appliances both short-term (3 months) and long-term (3 years).

**Design:** Prospective clinical trial using consecutive patients.

**Participants:** 29 consecutive subjects with mild-to-moderate sleep apnea referred for an oral appliance.

**Methods:** OSA was verified by use of a portable polysomnography device, and response to the oral appliance was determined by repeat polysomnography at 3 months. Blood pressure readings were taken at baseline, 3 months after starting the oral appliance, and after 3 years of wearing the oral appliance.

**Results:** 25 of the 29 patients responded well to the oral appliance and continued in the study (86%). Among the 29 patients, 26 were hypertensive prior to the study. There was a reduction in systolic blood pressure by 15 mm Hg and diastolic pressure by 10 mm Hg after 3 months. Twenty-two of the 25 subjects were available for long-term follow-up, and the reduction in blood pressure was stable 3 years after the start of oral appliance treatment.

**Conclusions:** The use of oral appliances for the treatment of OSA has the potential to significantly decrease blood pressure and, therefore, may have a positive effect on overall health.

**Reviewer's Comments:** The association of OSA with long-term chronic health problems may be due in part to hypertension. The facts that long-term improvements in blood pressure can be seen with oral appliances and that most subjects were still wearing their appliances regularly after 3 years indicates the significant value of these appliances in the treatment of OSA. As orthodontists, we are still concerned about the dental changes that can be seen after long-term use of oral appliances and we will continue to modify appliance design to minimize these changes. (Reviewer-Brent E. Larson, DDS, MS).

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*Keywords:* Obstructive Sleep Apnea, Oral Appliance, Blood Pressure

*Print Tag: Refer to original journal article*
According to this study, 1 year after secondary bone grafting, 84% of the original cleft defect was filled with bone and there was adequate bone for implant placement in >80% of the graft sites.

**Background:** The outcome of secondary bone grafting has been largely assessed by 2-D radiographic techniques that are not capable of assessing bone volume.

**Objective:** To measure the success of secondary bone grafting in cleft children by use of 3-D cone beam imaging.

**Design:** Prospective clinical trial of consecutive patients.

**Participants:** 21 consecutive subjects undergoing secondary bone grafting; 17 were unilateral clefts and 4 were bilateral. The average age of patients at the time of grafting was 10.5 years.

**Methods:** Cone beam imaging was done on each individual just before grafting and again at least 1 year after grafting. The volume of the alveolar cleft defect was measured before grafting and 1 year later; the difference in the defect size represented the amount of bone fill. Other factors, such as original defect size, the presence of a lateral incisor, canine root development, age, gender and surgeon, were compared to the degree of graft retention to look for parameters related to successful grafting.

**Interventions:** Subjects had orthodontic expansion prior to grafting and the bone graft was taken from the iliac crest in all individuals.

**Results:** The average bone fill after 1 year was 84% of the original defect size. There was no difference in bone fill between unilateral and bilateral clefts, and there were also no differences related to the age, gender, canine development, presence of lateral incisors, or defect size. The method of volume measurement was found to be very reproducible.

**Conclusions:** Secondary bone grafting is very successful, with 84% of the defect remaining filled after 1 year.

**Reviewer's Comments:** When considering that no differences were found in this study for any of the parameters (such as size of defect, canine root development, and the presence of lateral incisor), we must remember that the sample size was quite small, and, therefore, any differences would have to be very large to be detected. I was encouraged by the 84% retention of bone fill and that the bone dimensions were sufficient in most cases to allow implant placement. It remains to be seen whether that bone volume can be maintained until an age where implant placement is possible. (Reviewer-Brent E. Larson, DDS, MS).

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Keywords: Cleft Lip, Cleft Palate, Bone Grafting, Cone Beam CT

Print Tag: Refer to original journal article
Effects of Shape, Length, Thread Design on Mini-Implant Retention

Effects of Taper Shape, Dual-Thread, and Length on the Mechanical Properties of Mini-Implants.
Angle Orthod 2009; 79 (September): 908-914

Dual-thread implants provide better mechanical stability than other types of mini-implants.

**Background:** Today, mini-implants are commonly used to enhance orthodontic anchorage. However, occasionally these implants become loose. Several designs of mini-implants with different lengths are possible. What is the best design and length for maximum stability?

**Objective:** To evaluate the influence of taper shape, micro-thread, and length of mini-implants on their initial stability.

**Design:** Experimental study performed in the laboratory.

**Methods:** 2 different types of mini-implant lengths were used. One length was 6 mm and the other was 8 mm, but both had a diameter of 1.6 mm. The authors tested cylindrical, tapered, and dual-thread mini-implants. These were inserted into experimental bone-like material, and the maximum insertion torque, maximum removal torque, torque ratio, removable angular momentum, and time of maximum insertion torque were assessed.

**Results:** The results of this study showed that the cylindrical shape had the lowest insertion torque and removal torque for each of the different lengths. Although the tapered shape showed the highest maximum insertion torque in each length, the dual-thread shape showed significantly higher maximum removal torque, torque ratio, and maximum insertion torque in each length. The longer length group showed significantly higher measurements than the shorter length mini-implants.

**Conclusions:** The dual-thread shape and longer length showed the best removal torque and insertion torque compared to the other styles and types of mini-implants.

**Reviewer's Comments:** It appears that the modification of thread, such as dual-thread, may be less harmful to the surrounding tissue because of the lower insertion torque. This modification may also provide short and small mini-implants better mechanical stability with a high removal torque. (Reviewer-Vincent G. Kokich, DDS, MSD).

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Keywords: Mini-Implants, Mechanical Properties

Print Tag: Refer to original journal article
Celecoxib significantly reduces stress and orthodontically related tooth pain associated with activating an orthodontic appliance.

**Background:** A common problem related to orthodontic treatment is the tooth pain that is perceived after adjustment of orthodontic appliances. Although the pain is not significant, some patients experience increased stress related to this tooth pain. Nonsteroidal anti-inflammatory drugs (NSAIDs) have been used to reduce orthodontic pain. While celecoxib has been shown to be effective in relieving pain in other types of surgery, will it reduce postorthodontic pain and stress experimentally?

**Objective:** To investigate the effect of celecoxib on pain and stress during tooth movement by observing behavior in an animal model. **Design/Subjects:** Laboratory experiment involving 28 male rats.

**Methods:** The animals were divided into 4 groups, 2 control groups and 2 experimental groups. An orthodontic appliance was placed to deliver a force between the first molar and adjacent premolar. In one of the groups, celecoxib was given 1 hour before activation of the orthodontic appliance. In group 2, the celecoxib was given before activation, and then saline was given during the experiment. In the control group, saline was given before the force application; the fourth group simply had a passive appliance. The animals were observed to determine their level of stress, which indicated the degree of pain involved in the tooth movement.

**Results:** Results showed that the stress of the animals was significantly reduced and compared favorably with the passive control groups when celecoxib was injected before and during the experiment. The pre-emptive administration of celecoxib reduced pain as demonstrated by the lower pain and stress scores in the experimental groups.

**Conclusions:** The administration of celecoxib 1 hour before activating an orthodontic appliance, followed by 2 days of drug intake, reduced the levels of pain and discomfort produced by orthodontic treatment in rats as evidenced by pain-related behaviors.

**Reviewer’s Comments:** Although this was an animal study, its results and conclusions are important. The use of a NSAID, such as celecoxib, could be a beneficial means of controlling pain in orthodontic patients who are extremely sensitive to activations of orthodontic appliances. (Reviewer-Vincent G. Kokich, DDS, MSD).
Decreasing pitch and the presence of fluting increases pull-out strength of mini-screw implants.

**Background:** Today, mini-screw implants are a popular means of increasing anchorage for orthodontic treatment. While a wide variety of mini-screw implants are available, the stability of mini-screw implants is a concern. Does the pitch of the screw or the presence of longitudinal fluting affect the stability of mini-implants?

**Objective:** To evaluate the effects that pitch and fluting have on primary stability of mini-screw implants.

**Design:** Laboratory experimental.

**Methods:** The placement torque and pull-out strength of experimental mini-screw implants were compared. Three different levels of pitch were tested, including 1 mm, 1.25 mm, and 0.75 mm. In addition, mini-screw implants with 3 longitudinal flutes were compared to implants without flutes. A total of 60 mini-screw implants were placed and evaluated in both synthetic and cadaver bone models to assess the findings.

**Results:** The results of this study showed that pull-out strength significantly increases as pitch decreases from 1 mm to 0.75 mm. No significant difference in pull-out strength was noted between implants with a 1.0-mm and a 1.25-mm pitch. Mini-screw implants with longitudinal flutes have significantly higher placement torque and greater pull-out strength than implants without flutes.

**Conclusions:** Placement torque and pull-out strength are affected by the pitch of the mini-implant screw and the presence or absence of longitudinal flutes.

**Reviewer's Comments:** Primary stability of mini-screw implants is important. This study has clearly shown that smaller pitch and the presence of longitudinal flutes will enhance primary stability so that mini-screw implants can be used immediately after placement to enhance orthodontic anchorage. (Reviewer-Vincent G. Kokich, DDS, MSD).

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**Keywords:** Mini-Screw Implants, Pitch, Longitudinal Fluting, Primary Stability

**Print Tag:** Refer to original journal article
Materials Do Not Improve Torque Stability of Plastic Brackets

**Background:** In order to improve aesthetics for patients, many orthodontists use plastic brackets. Do these brackets deform in response to torquing forces, and if so, are there any additions to the brackets that can reduce the deformation?

**Objective:** To compare the loading deflection behavior of plastic brackets made of various materials in response to repeated torque loads with each other and with steel brackets. **Materials:** The sample for this study consisted of 7 different standard edgewise plastic brackets made by 4 different manufacturers.

**Methods:** The bracket materials tested in this study were polycarbonate, ceramic-reinforced polycarbonate, fiberglass-reinforced polycarbonate, ceramic-reinforced polycarbonate with a metal slot, fibreglass-reinforced polycarbonate with a metal slot, polyurethane, and polyurethane with a metal slot. Ten brackets from each group were mounted on a testing machine and had 20° of torque placed on them. Each group of plastic brackets was artificially aged and then torqued with a testing machine 5 times consecutively in a torque-measuring apparatus. There was also a control group of 10 stainless steel brackets.

**Results:** The slot of all the polycarbonate-based brackets was bent open after a single load, except for those with a metal slot. The loss of torque stability ranged from 5% for pure polyurethane brackets and 28.5% for ceramic-reinforced polycarbonate. The addition of ceramic and fiberglass and the use of polyurethane plastic failed to bring about an improvement in the elastic characteristics of polycarbonate brackets under torque load. There were no significant differences between these brackets and the 100% polycarbonate brackets. The reinforcement provided by a metal slot lead to significantly less deformation of the polycarbonate and polyurethane brackets under torque load. All of the plastic brackets exhibited a significant difference from the metal brackets.

**Conclusions:** The addition of ceramic and fiberglass and the use of polyurethane result in no improvement in the torque stability of plastic brackets.

**Reviewer's Comments:** Although it is always risky to assume the results of laboratory studies will be repeated clinically, an advantage of this study was that the brackets were artificially aged prior to testing. I was not surprised that the metal slot for both the polycarbonate and polyurethane brackets reduced deformation of the brackets under torque load. I was somewhat surprised that neither the addition of ceramic and fiberglass nor the use of polyurethane brought about any improvement in the torque stability of plastic brackets. (Reviewer-John S. Casko, DDS, MS, PhD).

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Keywords: Plastic Brackets, Torque Stability

Print Tag: Refer to original journal article
An internationally compatible survey to evaluate quality of life in patients with pronounced jaw discrepancies is being developed.

**Background:** Due to their facial deformities, patients who require orthognathic surgery often have an impaired quality of life. If an internationally standardized survey can be developed to evaluate quality-of-life issues for orthognathic surgery patients, it would be a valuable additional tool for their evaluation.

**Objective:** To translate an English questionnaire used for evaluating quality of life for orthognathic patients into German and to use it to evaluate a sample of 50 patients scheduled for combined orthodontic orthognathic surgery treatment.

**Participants:** The sample for the study consisted of 50 consecutively and randomly selected patients who were undergoing clinical examination and being informed on the options for combined orthodontic and surgical treatment.

**Methods:** The Orthognathic Quality of Life Questionnaire (OQLQ) that is used internationally was translated into German and adapted in accordance with European Union Guidelines. The questionnaire was administered to 50 patients, and the results were statistically evaluated.

**Results:** Patients with a dentofacial deformity severe enough to be evaluated for orthognathic surgery were usually well aware of their deformity and reported a reduction in their quality of life.

**Conclusions:** Patients, who require combined orthodontic and orthognathic surgery, often have a significantly impaired quality of life.

**Reviewer’s Comments:** I believe the translation of the OQLQ questionnaire into German is an excellent first step in developing a standardized questionnaire that can be used in all countries regardless of language. Using an internationally standardized questionnaire will increase both the reliability and validity of results and provide a means to document the need, based on quality-of-life issues, for orthognathic surgery. The authors plan to develop a larger sample in a future study and document the specific type of malocclusion for each patient and then relate this to the results of the survey. I look forward to seeing the results of this follow-up study.

(Reviewer-John S. Casko, DDS, MS, PhD).

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Keywords: Orthognathic Surgery, Quality of Life, Dentofacial Deformity

Print Tag: Refer to original journal article
Incorrect Orofacial Functions Until 5 Years of Age and Their Association With Posterior Crossbite.

Ovsenik M:


An abnormal swallowing pattern in the primary dentition is correlated with the development of posterior cross-bite.

Background: It has been estimated that the prevalence of posterior cross-bite in the deciduous and mixed dentitions varies from 8% to 23%. In order to reduce the occurrence of posterior cross-bite, it is important to identify factors in the primary dentition that are correlated with the development of posterior cross-bite.

Objective: To assess irregular orofacial functions to determine their correlation with posterior cross-bite.

Participants: 243 children examined at the 3, 4, and 5 years of age.

Interventions: The presence of posterior cross-bite was identified for each subject. A questionnaire identified the presence of sucking habits, and the subjects were clinically evaluated for abnormal orofacial functions, including swallowing pattern.

Results: Posterior cross-bite at 5 years of age was identified in 20% of the children. The presence of mouth breathing and dummy or pacifier sucking was significantly greater in patients with posterior cross-bites. At age 3 years, there was no difference in atypical swallowing patterns between the cross-bite and non-cross-bite subjects. However, the atypical swallowing pattern in the cross-bite group showed a tendency to increase from ages 3 to 5 years, whereas in the non-cross-bite group, it decreased substantially.

Conclusions: An abnormal swallowing pattern in the primary dentition is related to the development of posterior cross-bite.

Reviewer's Comments: This was an interesting study. The results indicate that in the primary dentition, both dummy or pacifier sucking and abnormal swallowing are related to the development of posterior cross-bite. I was aware of the importance of identifying abnormal sucking habits in the primary dentition, but was not aware of the importance of identifying an abnormal swallowing pattern. (Reviewer-John S. Casko, DDS, MS, PhD).

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Keywords: Orofacial Functions, Posterior Cross-Bite

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