In a recent study by Strahm et al, a treatment strategy is investigated that was specifically designed to move lower incisors forward bodily; however, careful observation showed only incisor tipping, with no measurable forward movement of the incisor root apices.

**Background:** Debate exists over whether lower incisors can be moved forward bodily if proper labial root torque is applied.  
**Objective:** To measure the change in lower incisor position when a treatment strategy is employed specifically designed to move the lower incisors forward bodily.  
**Design:** Retrospective study using existing patient records.  
**Participants:** 27 Class II patients (mean age, approximately 10 years) with retruded lower incisors that were treated with mechanics designed to bodily move the lower incisors forward were included. The comparison group was 26 age-matched patients who had similar malocclusions, but were treated in a more conventional manner.  
**Methods:** All subjects had cephalograms before treatment (T1), after the first phase of treatment (T2), and at the completion of fixed appliance treatment (T3). The cephalograms were traced and measured to investigate the change in lower incisor position.  
**Interventions:** The experimental group had first phase treatment designed to move the lower incisors forward bodily. This was attempted with a lower 2 x 4 appliance exerting labial root torque on the incisors and a reverse headgear (RHG) pulling forward on the lower arch. The comparison group had a conventional headgear-activator treatment during Phase I. Both groups had full-fixed orthodontic treatment to complete the treatment.  
**Results:** The lower incisors in the experimental group were tipped forward despite the efforts to move them bodily with labial root torque. No forward movement of the lower incisor apex could be measured.  
**Conclusions:** Despite a deliberate attempt to move lower incisors forward bodily, only tipping movements were seen. The width of the lower anterior apical base should not be viewed as changeable during orthodontic planning.  
**Reviewer's Comments:** This study gives some support to those who would say bodily advancement of the lower incisors is not possible. Despite efforts by the clinician to place labial root torque and an advancing force on the lower arch, only tipping was seen. On the other hand, the force system in this case was not well controlled and it could be that the practitioner was just not successful in applying the forces that were envisioned. At any rate, at this time it seems prudent to plan orthodontic treatment with the understanding that the lower incisor apex will not move forward. (Reviewer-Brent E. Larson, DDS, MS).

© 2009, Oakstone Medical Publishing

Keywords: Class II, Incisor Position, Cephalometrics  
Print Tag: Refer to original journal article
Standard of Care Is an Important Aspect of a Profession

Standard of Care: Why It Is Necessary.
Riolo ML, Vaden JL:


If orthodontists do not develop their own criteria and standards for care, someone else will, and it will most likely be an outside regulatory body.

Background: To protect the public it is important to have standards of care for orthodontic treatment. The specialty of orthodontics has an obligation and a right to develop criteria and standards for orthodontic treatment.

Objective: To discuss the necessity of developing a standard of care for orthodontic treatment.

Results: It is important for orthodontists to understand that developing a standard of care does not mean that every patient must be treated to an ideal result. Obviously, there are a number of circumstances, such as growth, patient cooperation, oral hygiene and patient resources, as well as concerns that legitimately prevent the achievement of an ideal treatment result for many patients. Establishing a standard of care simply means that within general guidelines, the orthodontic treatment provided to a patient is reasonable. One element that defines a profession is that it establishes and enforces its own standards. Orthodontics, therefore, has an obligation and a right to develop criteria and standards for orthodontic treatment. These standards of care would apply to all orthodontic treatment regardless of whether or not it was provided by an orthodontist or someone else. The main concern presented in this article is that if we as orthodontists do not establish a standard of care for orthodontic treatment, someone else will and most likely this other entity, whether it be a government regulatory body or another entity, will most likely be influenced by considerations other than the welfare of the patients who receive orthodontic care.

Conclusions: The specialty of orthodontics has an obligation and a right to develop criteria and standards of care.

Reviewer’s Comments: This was an excellent and thought-provoking article. I encourage you to read this article because I believe most orthodontists do not fully understand what a standard of care actually is or the need to establish one for orthodontic treatment. Treating to an orthodontic standard of care does not mean that every patient must achieve an ideal result. Standards of care for orthodontics should be realistic and achievable for the majority of orthodontists. (Reviewer- John S. Casko, DDS, MS, PhD).

© 2009, Oakstone Medical Publishing

Keywords: Standard of Care, Orthodontic Treatment

Print Tag: Refer to original journal article
Self-Tapping Implants Can Be Loaded Immediately

Influence of the Length of Loading After the Placement of Orthodontic Mini-Implants on Changes in Bone Histomorphology: Microcomputed Tomographic and Histologic Analysis.


Int Journal Oral Maxillofac Implants 2009; 24 (September): 842-849

Immediate loading of self-tapping implants results in favorable healing of bone around the mini-implants.

**Background:** Today, mini-implants are commonly used to support anchorage in the treatment of difficult malocclusions. A question that has developed over the years is the timing of loading mini-implants. One popular type of mini-implant is the self-tapping implant. Can this implant be loaded immediately, or should the clinician wait for a period of healing after placement of the implant?

**Objective:** To investigate the morphologic changes in peri-implant bone at 3, 6, and 12 weeks after self-tapping mini-implant placement in experimental animals.

**Design:** Experimental study performed in 8 beagle dogs.

**Methods:** 48 orthodontic mini-implants were placed in these animals. The implants were divided into 3 groups, including an immediate loading group, an early loading group, and a control group. Early loading occurred three weeks after implant placement. An orthodontic force of approximately 250 g was placed on the experimental implants. After 3, 6, and 12 weeks, the histologic analysis of the peri-implant bone was evaluated.

**Results:** Results showed that the bone-implant contact in both of the experimental groups was similar at the 3 and 6 week intervals. At 12 weeks, there were slight differences that were not clinically significant. The authors found that the peri-implant bone around the immediately loaded implants was satisfactory to support anchorage when an orthodontic force was applied.

**Conclusions:** Histologic analysis has shown that immediate loading of self-tapping implants is possible and recommended.

**Reviewer's Comments:** This study showed that self-tapping implants can be loaded immediately, and I would agree with this finding. However, some implants are not self-tapping. Some require the drilling of a pilot hole. Anytime a pilot hole is drilled, it causes heat that can produce bone necrosis. If a pilot hole is drilled, I believe that immediate loading can be a problem. So, this study only applies to self-tapping implants. (Reviewer-Vincent G. Kokich, DDS, MSD).

© 2009, Oakstone Medical Publishing

Keywords: Implant Loading, Length of Loading, Mini-Implants, Bone Histomorphology

Print Tag: Refer to original journal article
In this assessment of mothers from several cultures, there are differences in the maternal affect scores, which indicate a different reaction of mothers to the birth of a cleft child.

**Background:** Little is known about the differences across cultures in maternal reactions to the birth of a cleft child. Mothers' responses can affect psychosocial development and the child's self-esteem.

**Objective:** To compare the maternal response to the birth of a cleft child among several cultures.

**Design:** Prospective assessment using a validated questionnaire translated into several languages.

**Participants:** 110 mothers from 4 different cultures were compared to a previously published group of 99 American mothers.

**Methods:** The standardized questionnaire, When My Child was Born, was translated into several languages and used as the measurement instrument of maternal response. This survey instrument was administered to mothers as their children were brought in to receive surgery from medical mission teams. The 4 cultures assessed were Thai, Colombian, Chinese, and Uygur (a small muslin population in China). The scores for maternal affect were used to compare the mother's reaction in each of the cultures. The results from these cultures were compared to a previously published group of American mothers.

**Results:** The Thai mothers had the highest scores, meaning they were the most positive in reaction to the birth. The Colombian, American, and Uygur mothers were similar and scored near the median of all responses. The Chinese mothers scored lower than the other groups, and it was thought this may be due to the "one-child policy" in China to control population.

**Conclusions:** There are distinct cross-cultural differences in the maternal response to the birth of a cleft child.

**Reviewer's Comments:** The maternal response to the birth of a cleft child can affect the way the child is treated by the mother after birth. This in turn can have a dramatic effect of the child's psychosocial development and development of self-esteem. It is important for care providers to recognize the cultural differences as they provide services for these patients on medical missions or in their own communities. (Reviewer-Brent E. Larson, DDS, MS).

© 2009, Oakstone Medical Publishing

**Keywords:** Cleft Lip, Cleft Palate, Cultural/Maternal Reactions

**Print Tag:** Refer to original journal article
Can Functional Appliances Have Long-Term Effect on Mandibular Position?

Long-Term Dentoskeletal Changes With Bionator, Herbst, Twin Block, and MARA Functional Appliances.

Siara-Olds NJ, Pangrazio-Kulbersh V, et al:

Angle Orthod 2010; 80 (January): 18-29

Although functional appliances can correct dental malocclusions, they have no long-term effect on mandibular position compared to untreated control Class II malocclusions.

**Background:** Functional appliances have been popular for many years. These functional appliances include the Bionator, Herbst, Twin Block, and MARA appliances. Many clinicians utilize these during an initial phase of treatment on young individuals to correct Class II malocclusions. Theoretically, these functional appliances can accelerate and perhaps improve a patient’s mandibular growth potential. But, does that really happen? What about the long-term effects of these appliances compared to untreated controls?

**Objective:** To assess the treatment outcome of tooth-born functional appliances and their stability with time compared to each other and to untreated controls with similar Class II malocclusions.

**Design:** Prospective trial.

**Methods:** The use of 4 different functional appliances to themselves and also to a group of untreated control Class II subjects was compared. The treated sample consisted of 80 patients who were divided evenly among the 4 groups. These subjects were either treated with a Bionator, Herbst, Twin Block, or MARA appliance. All of this treatment was performed when the patients were between the ages of 8 and 12 years. Then, each subject received comprehensive orthodontic therapy with bands and brackets to complete their treatment. The total treatment interval for all subjects was nearly 4 years. The authors compared cephalometric radiographs taken pretreatment, after functional appliance therapy, and after comprehensive orthodontics. These 4 subgroups were compared with an untreated control sample of Class II subjects who had cephalometric radiographs taken at similar time periods.

**Results:** Results of this study showed that functional appliances are successful at correcting Class II malocclusions. When compared among themselves, the Herbst and MARA appliances significantly restricted maxillary growth and produced a steeper occlusal plane. The Twin Block was most effective in controlling the mandibular plane angle and had the greatest effect long-term on the labioversion of the mandibular incisors. However, when comparing the long-term effect on mandibular growth, there were no differences in any of these functional appliance groups compared to untreated, control, Class II subjects.

**Conclusions:** Functional appliances are successful at treating the dental relationship, but have no impact on mandibular position compared to untreated Class II malocclusions.

**Reviewer’s Comments:** I liked this study. For years, clinicians have been claiming improved growth with functional appliances. However, in more recent years, these claims have been questioned. This study compared 5 different appliances to determine whether or not they were effective at treating Class II malocclusions. They are effective, but they have no impact on the growth potential of the mandible long-term. (Reviewer-Vincent G. Kokich, DDS, MSD).

© 2009, Oakstone Medical Publishing

Keywords: Mandibular Growth, Alterations, Appliances

Print Tag: Refer to original journal article
The Next Step for Cone-Beam Imaging in Orthodontics

*Dynamic Cone-Beam Computed Tomography in Orthodontic Treatment.*

Chenin DL, Chenin DT, et al:


This article demonstrates the next generation of software available to provide all the diagnostic information an orthodontist needs from a single CBCT scan.

**Background:** Cone-beam computed tomography (CBCT) imaging has been used for static assessment in orthodontics, but now software is becoming available to expand the usefulness of CBCT for orthodontic diagnosis and treatment planning.

**Objective:** To describe the capabilities of a new generation of software that increases the capabilities to view, simulate, and evaluate orthodontic treatment.

**Design:** Expert review.

**Results:** CBCT has been an exciting advancement in orthodontics to visualize skeletal and dental relationships in 3 dimensions. New software being developed for the CBCT images has the potential to add more functionality for the orthodontist. Dr. Chenin describes some of these advancements, which are now available in the InVivoDental software by Anatomage. The advancements include the ability to extract digital study models from the CBCT, which could eliminate the need for impression taking. These digital models are unique because they include the tooth roots and impacted or unerupted teeth, which are not available on conventional dental casts. This also becomes a dynamic process as the individual teeth are available to be moved to simulate orthodontic treatment. The CBCT image can also be combined with a conventional digital photograph to provide a real 3D soft-tissue image without the expense of a 3D camera. Treatment progress and outcome can be assessed by using superimposition tools included in the software. These superimpositions can now provide 3D information about tooth, skeletal, and soft-tissue changes. Just as segmentation of the teeth allows simulation of orthodontic movement, segmentation of the jaws is possible to simulate surgical movements. There is the potential to add functional information in the future using a jaw-tracking device to make the CBCT image into a virtual articulator. And, with continued improvements, therapeutic devices, like clear aligners, retainers, indirect bonding set-ups and custom arch wires, could be delivered.

**Conclusions:** The CBCT scan is rapidly being developed to provide a complete set of diagnostic records for the patient, as well as providing the platform for treatment simulation and, in the future, a whole range of custom therapeutic devices.

**Reviewer's Comments:** This gives a good summary of where CBCT is headed in orthodontics. Be skeptical, though, since the article was written by dentists who work for Anatomage. Although there is great potential in using CBCT for orthodontic purposes, there are still limitations. Extracting digital models in patients with restorations is still difficult and may require impressions. Treatment simulation is possible, but additional tools are needed to make it easier for the clinician to use on a routine basis. Superimposition is possible, but landmark registration is susceptible to significant error based on errors in landmark identification. And, we still need to discuss whether the added radiation burden is of sufficient value to justify the use of CBCT on a routine basis. (Reviewer-Brent E. Larson, DDS, MS).

© 2009, Oakstone Medical Publishing

Keywords: CBCT, Treatment Simulation, Digital Models

Print Tag: Refer to original journal article
The specialty of orthodontics has an obligation and a right to develop criteria and standards for care.

**Background:** Patients and parents would be more knowledgeable about orthodontic treatment if there were established standards for orthodontic care. To help our patients, it is important that we, as orthodontists, establish these standards.

**Objective:** To encourage members of the specialty and professional societies to begin to develop a standard of care in a structured way so that guidelines are established and the specialty and patients who receive specialty care can benefit.

**Results:** It is important to understand that if orthodontic standards of care were developed, they would apply to all orthodontic care regardless of who provided the treatment (ie, specialists or general practitioners). Developing valid standards of care will require input from the orthodontic specialty, orthodontic educators, and privately practicing orthodontists. Orthodontic educators need to develop standards and plan teaching programs around accepted guidelines and not around specific treatment techniques. They also need to teach orthodontic residents how to critically evaluate research articles to be able to differentiate those that are based on valid research procedures versus those that are not. This is particularly important today because of the large number of orthodontic presentations given by speakers who are associated and supported by supply companies, talking about a specific appliance in which they have a financial interest or presenting material based on individual case reports. Orthodontic private practitioners need to get involved in establishing standards of care so that they are practical, realistic, and achievable by a majority of orthodontists.

**Conclusions:** The public is best assured of quality treatment by the application of a single high level of care irrespective of the educational and experiential qualifications of the practitioner providing the services.

**Reviewer's Comments:** This article and the other special article that appeared in the October 2009 issue of the American Journal of Orthodontics and Dentofacial Orthopedics are very timely and critical for orthodontists to understand. To provide the best care for our patients, it is important that we as a specialty work together to establish a standard of orthodontic care that applies to all orthodontic treatment regardless of provider. If we do not do this, standards will likely be established by some entity with a self interest that will not necessarily relate to the best interests of our patients. (Reviewer-John S. Casko, DDS, MS, PhD).

© 2009, Oakstone Medical Publishing

Keywords: Orthodontics, Standard of Care

Print Tag: Refer to original journal article
Calciuym Sulfate Provides Less Shrinkage of Alveolus, Better Implant Site

Clinical and Histological Healing of Human Extraction Sockets Filled With Calcium Sulfate.

Aimet M, Romano F, et al:

Int J Oral Maxillofac Impl 2009; 24 (September): 901-909

Grafting human extraction sockets with medical-grade calcium sulfate reduces the shrinkage of the alveolar ridge prior to implant placement.

Background: Implants are commonly used today to replace missing teeth. Occasionally, tooth roots, both permanent and primary, must be extracted prior to implant placement. When teeth are extracted, the ridge typically shrinks both buccolingually and vertically. Should these ridges receive a graft at the time of extraction to prevent this shrinkage prior to implant placement?

Objective: To evaluate, clinically and histologically, the pattern of hard tissue formation and the crestal bone changes in fresh extraction sockets when calcium sulfate is used as filler.

Design/Participants: Prospective trial in which 40 subjects had at least 1 tooth extracted.

Methods: After tooth extraction, 22 patients had the socket filled with medical-grade calcium sulfate. For the other 18 subjects, no graft material was placed in the socket. During the extraction, the height and width of the alveolus was measured. Three months after the extraction, these sites were revisited and implants were placed. Prior to implant placement, the height and width of the alveolus was again measured to be compared with the measurements at extraction. In addition, biopsies were made to determine the consistency of the bone within the previous socket.

Results: Results showed that there was a statistically significant increase in both vertical height and buccolingual width of the alveolus in those groups that received the medical-grade calcium sulfate grafting. In addition, the authors showed that histologically, there was a greater percentage of lamellar bone in the sites that were grafted compared to the nongrafted sites.

Conclusions: Grafting of extraction sockets with medical-grade calcium sulfate provides less shrinkage of the alveolus and, therefore, better sites for implant placement.

Reviewer's Comments: This is good news for orthodontists who treat patients who are congenitally missing teeth and must have primary teeth extracted because of ankylosis. When these primary second molars are extracted, it may be wise to have the surgeon fill the socket with medical-grade calcium sulfate. This provides less shrinkage of the alveolus and a potentially better implant site, when the implants are eventually placed. (Reviewer-Vincent G. Kokich, DDS, MSD).

© 2009, Oakstone Medical Publishing

Keywords: Extraction Sockets, Shrinkage, Grafts, Filler, Calcium Sulfate

Print Tag: Refer to original journal article
Is Repeatability of Bracket Positioning Better With Indirect Bonding?

*Precision of Bracket Placement on Dental Models.*

Lai M-L, Mah J:

J Clin Orthod 2009; 43 (August): 524-528

Using a 3D measuring system, the precision (repeatability) of bracket positioning is slightly better with indirect bonding, but the difference is not great.

**Background:** There is little evidence regarding the precision of bracket placement using various methods.

**Objective:** To develop a method for measuring actual bracket position relative to the intended ideal.

**Design:** Laboratory study using virtual bracket positioning and placement on mannequins.

**Participants:** 5 orthodontists placed brackets on mannequins and casts.

**Methods:** Each of the 5 orthodontist positioned virtual brackets on virtual models for a reference bracket position. Each then directly bonded 3 upper and lower arches on a mannequin and 3 pairs of arches using any preferred indirect bonding technique. Three pairs of arches were also bonded using a laboratory digital indirect bonding process. The position of each bracket was measured precisely using an optical measurement system and the position of each bracket compared to the ideal. The precision, or repeatability of bracket positioning, was calculated.

**Results:** The precision, or repeatability of bracket positioning, was only slightly better than indirect bonding. The greatest improvement was with the laboratory indirect bonding process.

**Conclusions:** A method for precise measurement of bracket positioning was devised. The precision (repeatability) of bracket positioning was slightly better than indirect bonding, but the difference was not great.

**Reviewer’s Comments:** Precision is the repeatability in placing a bracket, whereas accuracy is placing the bracket where it was intended. This study showed that although the precision may have been slightly better than indirect bonding, the difference was not large. The authors promise that the accuracy of placement will be investigated in the future, and it will be interesting to see if indirect bonding is able to improve accuracy. It would also be an advantage if they could find a way to measure the precision and accuracy on real patients since the mannequin simulation may not represent real world conditions. (Reviewer-Brent E. Larson, DDS, MS).

© 2009, Oakstone Medical Publishing

Keywords: Bracket Placement, Bonding, Precision, Indirect Bonding

Print Tag: Refer to original journal article
When evaluated at 2 separate times, an orthodontist can be expected to agree with his or her own cervical maturation staging, on average, only 62% of the time.

**Background:** For a long time, orthodontists have used hand-wrist radiographs in an attempt to identify different growth stages. More recently, a cervical vertebrae maturation (CVM) method has been proposed to identify growth stages without the need to take an additional radiograph. How accurately can orthodontists identify the different stages of CVMs used in this method?

**Objective:** To evaluate the reproducibility of CVM stage determination by practicing orthodontists.

**Participants:** 10 practicing orthodontists trained in the CVM method.

**Methods:** Each of the orthodontists evaluated 30 individual and 30 pairs of cephalometric radiographs at 2 different times. Statistical analysis was used to evaluate the intra- and interobserver agreement between the identification of the cervical maturation stages at the 2 different time periods.

**Results:** When the intraobserver CVM stages were evaluated for the 2 time periods, there was only 45% agreement and 55% disagreement at the initial time, which did not significantly change at the 3-week period. On average, an orthodontist can be expected to agree with his or her own CVM staging only 62% of the time. One of 3 times when an observer was inconsistent in judging a particular stage, he or she was off by at least 2 stages.

**Conclusions:** The ability of practicing orthodontists to accurately identify the different stages used in the CVM method of growth prediction is very poor.

**Reviewer's Comments:** The CVM method for predicting maturation method and predicting growth has become popular because it does not require taking an additional radiograph, such as a hand-wrist radiograph. Most of the time when you hear discussions about the use of hand-wrist radiographs or cervical vertebrae radiographs, there is debate as to whether or not these methods can actually predict individual growth. This article makes that question irrelevant because it questions the very basis of the CVM method of growth prediction, which is to be able to accurately identify the individual stages in the method. Maybe we will eventually get an accurate method of growth prediction that will allow us to improve the timing of treatment for individual patients. (Reviewer-John S. Casko, DDS, MS, PhD).

© 2009, Oakstone Medical Publishing

Keywords: Cervical Vertebrae Maturation, Reproducibility, Growth

Print Tag: Refer to original journal article
Orthognathic surgical correction of unilateral posterior cross-bite and mandibular prognathism results in a more normal grinding type chewing pattern compared to a reverse pattern seen before surgery.

**Background:** Although Class III malocclusion is not common, a typical situation that occurs with mandibular prognathism is unilateral posterior cross-bite. Because of the cross-bite, patients usually have a reverse chewing pattern as the mandible moves during mastication. Does surgical correction of the prognathism and cross-bite result in a more normal grinding-type chewing pattern?

**Objective:** To examine the movement of the mandible in skeletal Class III patients with a unilateral cross-bite to clarify whether the correction of the cross-bite caused conversion of the masticatory movement from a reverse to a grinding chewing pattern.

**Design/Participants:** This was a prospective study that involved 10 adult patients with mandibular prognathism and unilateral posterior cross-bite.

**Methods:** All subjects were treated with orthodontics and jaw surgery. Their masticatory movement and rhythm were recorded before any orthodontic treatment and at least 4 to 6 months after orthodontic appliances were removed. All subjects had jaw surgery to correct the prognathism and posterior cross-bite.

**Results:** These subjects had a significantly different chewing pattern after the jaw surgery. Instead of the reverse-type masticatory movement that was seen preoperatively, the majority of subjects changed to a normal grinding pattern seen in control subjects without a posterior cross-bite.

**Conclusions:** Correction of unilateral posterior cross-bite results in conversion of a reverse chewing pattern to a normal grinding chewing pattern.

**Reviewer's Comments:** I liked this study. I had often wondered about whether patients with a mandibular shift caused by a unilateral posterior cross-bite would change their chewing pattern after surgical correction of the cross-bite. This study clearly shows that these chewing patterns tend to normalize to more of a grinding-type chewing pattern after jaw surgery. This is good news for patients and orthodontists. (Reviewer-Vincent G. Kokich, DDS, MSD).

© 2009, Oakstone Medical Publishing

Keywords: Chewing Pattern, Cross-Bite

Print Tag: Refer to original journal article
In this laboratory simulation of photoaging of enamel, no significant color change occurred in enamel after bracket removal and clean-up.

**Background:** There has been some suggestion that the composite tags left in the enamel surface after bracket removal and clean-up may result in a color change after orthodontic treatment.

**Objective:** To measure color change in enamel after orthodontic bonding, bracket removal, and composite clean-up.

**Design:** Laboratory study using artificial photoaging to simulate the potential for long-term discoloration.

**Methods:** 75 extracted human premolars with good enamel were divided into 5 groups for testing. All teeth were bonded with the same type of bracket using 5 different adhesives. The brackets were bonded, stored for 48 hours, subjected to artificial photoaging for 24 hours, then debonded, and exposed to photoaging again. The composite clean-up was done with a carbide bur in a high-speed handpiece, and further polishing was done with Stainbuster, a composite bur. Color measurements were taken before bonding, after the high-speed bur clean-up, after polishing, and after final photoaging.

**Results:** Color differences were recorded for some adhesives after high-speed bur clean-up and were likely the result of an increase in surface roughness, as this difference was not observed after polishing. No long-term color change in the enamel was observed after bracket bonding, removal, and simulated aging.

**Conclusions:** No evidence of color change in enamel after orthodontic debonding could be seen even after simulated aging.

**Reviewer’s Comments:** The concern that the composite tags left in enamel may be susceptible to color change was not supported by this study. Although a photoaging process was used to simulate long-term change, this process may not reflect the variety of liquids and stains that teeth in the mouth are exposed to. It was interesting to note that a measurable color change was noted before enamel polishing due to a change in surface roughness—an indication that enamel polishing after using a carbide bur is probably a good idea.

(Reviewer-Brent E. Larson, DDS, MS).

© 2009, Oakstone Medical Publishing

Keywords: Bonding, Discoloration, Composite

Print Tag: Refer to original journal article
Poor oral hygiene in orthodontic patients can harbor unwanted and potentially dangerous antibiotic-resistant microbes.

**Background:** Orthodontic appliances create the potential to harbor unwanted bacteria when oral hygiene is poor.

**Objective:** To attempt to isolate *Enterococcus* and *Escherichia coli* from the mouths of orthodontic patients with poor hygiene.

**Design:** Clinical study with control group.

**Participants:** 46 orthodontic patients with fixed appliances in place and 55 healthy control volunteers.

**Methods:** A supragingival plaque sample was obtained from each mouth. For the orthodontic patients, the plaque was sampled using a gingival scaler to the bracket base; for the control subjects, it was swabbed from the supragingival area. The plaque was grown in media specific for *Enterococcus* and *E. coli* to identify the presence of these microbes. Resistance to antimicrobial medications was tested for 11 specific antibiotics, and polymerase chain reaction was used to test for genes known to be involved in antimicrobial resistance.

**Results:** No *Enterococcus* or *E. coli* was present in the mouths of the healthy control subjects. Twenty percent of orthodontic patients were positive for the presence of *Enterococcus* or *E. coli*, and all of these patients had poor oral hygiene. Many of the bacteria isolated from the orthodontic subjects were found to be resistant to common antibiotic agents, and many had genes identified with resistance.

**Conclusions:** Poor oral hygiene in orthodontic patients can harbor unwanted and potentially dangerous antibiotic-resistant microbes.

**Reviewer’s Comments:** The presence of these unwanted bacteria may not be dangerous for a healthy adolescent patient but could be problematic for someone who is immune compromised or otherwise not in good health. This is another good reason to promote good hygiene in patients with orthodontic appliances. (Reviewer-Brent E. Larson, DDS, MS).

© 2009, Oakstone Medical Publishing

Keywords: Poor Hygiene, *Escherichia coli*, Bacteria

Print Tag: Refer to original journal article
In this study, a hand-wrist film was relatively good at predicting the remaining growth in statural height but was not helpful in predicting remaining craniofacial growth.

**Background:** The hand-wrist film is still used by some orthodontists for the prediction of remaining facial growth, although its ability to do so is questionable.

**Objective:** To study the ability of a hand-wrist film to predict the amount of remaining craniofacial growth in orthodontic-age adolescents.

**Design:** Retrospective study using existing records.

**Methods:** 485 patient records were reviewed against the inclusion criteria. This review resulted in 49 subjects (27 females, 22 males) who were appropriate for this study. The median age was approximately 12 years for both groups. All patients had hand-wrist films, lateral cephalograms, and statural height measurements available at T1. The subjects had the same records available after treatment at T2. The hand-wrist film was used to predict the amount of remaining statural and craniofacial growth, and this prediction was compared to the actual growth measured at T2. None of the patients had any appliance directed at growth modification during treatment.

**Results:** The hand-wrist film was relatively good at predicting the amount of statural growth remaining, with correlation coefficients of about 0.7 for both males and females. The hand-wrist film was poor at predicting the remaining craniofacial growth, with most correlations being very low and not statistically significant.

**Conclusions:** The hand-wrist film has very little value in predicting the amount of remaining craniofacial growth in orthodontic-age adolescents.

**Reviewer's Comments:** This study confirms others that have found good correlation between hand-wrist films and statural growth but poor correlation with facial growth. With this additional evidence, it would seem that the hand-wrist film should not be taken on adolescent orthodontic patients in order to help with growth prediction. (Reviewer-Brent E. Larson, DDS, MS).

© 2009, Oakstone Medical Publishing

**Keywords:** Hand-Wrist Radiograph, Growth Prediction

**Print Tag:** Refer to original journal article
Fluoride placed in compomer restorations does not reduce the incidence of caries compared to amalgam restorations in children.

**Background:** In the past 10 years, there has been a substantial shift from amalgam restorations to composite restorations. Because these composite restorations tend to lack the seal that was present around restorations with amalgam, fluoride has been added to these composite restorations to hopefully improve the future caries risk to these patients. Does the addition of fluoride have a positive effect on reducing the incidence of caries?

**Objective:** To compare the incidence of new caries after children are randomized to receive compomer or amalgam restorations over a 5-year period.

**Design/Methods:** This was a prospective, randomized, clinical trial. This study was part of a 5-year New England Children’s Amalgam Trial. Children were randomized to receive either amalgam (n=267) or composite (n=267) restorations at baseline and during the course of the trial. These composite restorations had fluoride added to them by the manufacturer. The follow-up time was about 3 years later. At that time, the authors determined whether there were new caries on a different surface of the same tooth or new caries on different teeth. The authors then compared the amalgam group and the composite group.

**Results:** No significant difference was found between materials relative to the rate of new caries on different surfaces of the same tooth. In fact, caries on other teeth appeared slightly more quickly after placement in the composite group compared to the amalgam group, but the differences were negligible after 5 years.

**Conclusions:** Based on the authors’ results, placement of composite restorations with fluoride added has no significant effect on reducing the future caries incidence compared to typical amalgam restorations.

**Reviewer’s Comments:** This is good information for orthodontists to be aware of. As the trend in posterior tooth restoration has changed from amalgam to composite, we are likely to see many more areas of recurrent decay in the future. In an attempt to reduce this potential problem, fluoride has been added to these composites; however, this study has shown that simply adding fluoride does not reduce the caries risk when composite and amalgam groups are compared long term. (Reviewer-Vincent G. Kokich, DDS, MSD).

© 2009, Oakstone Medical Publishing

Keywords: Caries, Incidence, Fluoride

Print Tag: Refer to original journal article
There are no psychological differences between orthognathic subjects with either Class II or Class III malocclusions compared to control subjects.

**Background:** As orthodontists, we treat adults who may have concerns about their facial appearance, and this may prompt them to have their malocclusion corrected. Do these individuals have any psychological problems prior to treatment that would complicate the orthognathic surgery and its outcome?

**Objective:** To establish the extent of psychological problems among patients who require orthognathic surgical treatment and to determine if the type of skeletal discrepancy (skeletal Class II or skeletal Class III) affects the patient's psychological status.

**Design:** This prospective study evaluated the psychological status of orthognathic patients compared to control subjects.

**Participants/Methods:** A sample of 162 white patients who were deemed to require orthognathic surgical treatment were compared to 157 control subjects who did not require orthognathic surgery. The delineation of the groups was performed by trained orthodontists. Each of these subject populations was given 5 psychological tests. These included tests for anxiety, self-esteem, depression, behavioral problems, and age adjustment of psychological measures. Next, the authors compared scores on the psychological tests among the 3 groups: Class II orthognathic subjects, Class III orthognathic subjects, and control subjects.

**Results:** No statistically significant differences were detected among the 3 groups when it came to the mean age-adjusted scores for the 5 psychological measures studied.

**Conclusions:** Compared with the control group, mean psychological scores were lower for both Class II and Class III skeletal subjects; however, these scores did not reach a level of statistical significance.

**Reviewer's Comments:** This was a surprising study. I would have thought that Class II and Class III subjects might have underlying psychological problems that could be uncovered in this study. The authors did suggest that the Class II and Class III subjects had worse scores in terms of their psychological stability but that the differences were not statistically significant. (Reviewer-Vincent G. Kokich, DDS, MSD).

© 2009, Oakstone Medical Publishing

Keywords: Psychological Status, Class II, Class III

Print Tag: Refer to original journal article
Extraction of 4 first premolars in subjects with bimaxillary protrusion has a favorable effect on the facial profile.

**Background:** The extraction of 4 first premolars is often avoided as a treatment plan. The concern is that premolar extraction will cause a reduction in the lip prominence, which could adversely affect a patient’s facial profile. However, premolar extraction could be beneficial in a patient with bimaxillary protrusion.

**Objective:** To evaluate the short-term perioral soft-tissue changes in patients with bimaxillary protrusion who had been treated by extraction of 4 premolars.

**Design/Methods:** This study involved a systematic review of the scientific literature on the topic of premolar extraction in patients with bimaxillary protrusion. The authors established strict inclusion criteria and, after searching several databases, included 4 articles that met these inclusion criteria.

**Results:** When first premolars are extracted, the upper lip retraction ranged from 2 mm to 3.2 mm, and the lower lip retraction ranged from 2 mm to 4.5 mm, with an increase noted in the nasolabial angle. Typically, in these patients with bimaxillary protrusion, the authors found that soft-tissue changes involved small amounts and did not modify the profile dramatically.

**Conclusions:** 4 premolar extraction in patients with bimaxillary protrusion does not produce a "dished-in" profile.

**Reviewer's Comments:** This was a good article. Many times, orthodontists avoid premolar extraction because of their concern of its impact on the facial profile, which could be negative. However, premolar extraction could enhance a patient's profile, especially if they have lip procumbency due to tooth proclination. This systematic review has validated that conclusion. (Reviewer-Vincent G. Kokich, DDS, MSD).

© 2009, Oakstone Medical Publishing

Keywords: Premolar Extraction

Print Tag: Refer to original journal article
Lateral correction of the chin with mandibular surgery can improve lip cant.

Background: Mandibular skeletal asymmetries are often associated with an excessive lip cant. If surgery is done in the mandible only to correct the lateral position of the chin, will this improve vertical lip cant?

Objective: To investigate the change of lip-line cant after 1-jaw orthognathic surgery in mandibular asymmetry patients.

Participants: The sample for this study consisted of 22 patients having 1-jaw orthognathic surgery with a menton deviation >2 degrees before surgery.

Methods: Postural anterior cephalometric radiographs, frontal photographs, and 3-dimensional CT images were used to evaluate changes in lip cant before and after asymmetric mandibular surgery. The differences were statistically analyzed.

Results: Postoperatively, the subjects had a significant improvement in lip cant of approximately 2 degrees. Preoperative lip line cant showed positive correlations with menton deviation and mandibular anterior occlusal plane cant.

Conclusions: Lip-line cant is present with chin deviation, even without significant maxillary canting, and can be improved considerably by 1-jaw surgery.

Reviewer’s Comments: I liked this article. Although most patients with skeletal mandibular asymmetry have an associated vertical asymmetry of the maxilla, there are a number of patients who have mandibular asymmetry with no accompanying vertical maxillary asymmetry. Based on this article, it appears that these patients can have a cant of the lip that can be corrected with mandibular asymmetry alone. Because the authors noted that preoperative lip-line cant is also associated with an anterior occlusal plane cant, I suspect that the patients in this study did have some vertical maxillary asymmetry, although it was most likely minimal. This study was well done, It's encouraging to know that if you have a patient with mandibular lateral skeletal asymmetry and minimal vertical asymmetry of the maxilla, it is possible to get a good correction of the lip line cant with mandibular surgery alone. (Reviewer-John S. Casko, DDS, MS, PhD).

© 2009, Oakstone Medical Publishing

Keywords: Lip Cant Correction, Mandibular Surgery

Print Tag: Refer to original journal article
Using 2 miniscrews in the palate attached to a distal jet appliance provides better molar distalization and is more hygienic than the use of an acrylic palatal button.

**Background:** For patients with a Class II division 1 malocclusion that is primarily the result of maxillary dental protrusion, it is often appropriate to distalize the maxillary molars. Is there an effective noncompliance appliance available to do this?

**Objective:** To investigate the suitability of a skeletonized distal jet for translatory molar distalization.

**Participants:** The sample for this study consisted of 10 patients with dentoalveolar Class II malocclusion and dental arch length discrepancies.

**Methods:** 2 paramedian miniscrews were placed in the anterior of the palate and attached to a palatal distal jet appliance with composite to the first premolars. To document molar movement in the molar plane, plaster dental casts were taken at the start of treatment and after distal jet appliance removal.

**Results:** Significant molar distalization averaging approximately 4 mm occurred, which was accompanied by slight mesial inward rotation of the molars. While there was some anchorage loss due to first premolar mesialization, it averaged <1 mm.

**Conclusions:** Significant translatory molar distalization was achieved using the skeletonized distal jet appliance supported by miniscrews.

**Reviewer’s Comments:** I was impressed by the results of this study. The maxillary occlusal changes for one patient showed significant spaces open between the maxillary first premolars and the first molars, which was impressive. Nance palatal buttons are often used to support anchorage for distalizing maxillary molars; however, these appliances often provide less than desirable anchorage and frequently create hygiene problems. The 2 screws used for the appliance in this article were placed in an area of the palate that would appear to provide excellent screw stability. (Reviewer-John S. Casko, DDS, MS, PhD).

© 2009, Oakstone Medical Publishing

Keywords: Skeletonized Distal Jet Appliance

Print Tag: Refer to original journal article
Does Orthodontic Treatment Lead to Long-Term Tooth Wear?

Relationship Between Malocclusion, Orthodontic Treatment, and Tooth Wear.
Mwangi CW, Richmond S, Hunter ML:

Neither the need for nor the provision of orthodontic treatment contributes to increased tooth wear.

**Background:** Many patients experience significant tooth wear. It would be nice to know if tooth wear is related to orthodontic treatment.

**Objective:** To determine if the need for, or receipt of, orthodontic treatment leads to differences in long-term tooth wear.

**Participants:** The sample for this study consisted of 307 adults aged 30 to 31 years who were part of a long-term observational study.

**Methods:** An index specifically designed for dental study casts was used to examine tooth wear. Study casts were used to evaluate the amount of tooth wear. Subjects who needed orthodontic treatment and those who received orthodontic treatment were identified and statistically compared with a group of patients who did not need or receive orthodontic treatment.

**Results:** Mean tooth wear scores for men were consistently higher than those for women. There were no significant differences in tooth wear in relation to the need for or the receipt of orthodontic treatment.

**Conclusions:** Tooth wear is not related to orthodontic treatment.

**Reviewer's Comments:** This was an interesting and excellent study. This was a unique sample of patients who were seen an average of approximately 19 years after initial records had been taken in childhood. These results provide both good news and bad news for orthodontists. The good news is that orthodontic treatment does not result in increased tooth wear. The bad news is that preventing tooth wear cannot be used as a reason for initiating orthodontic treatment. Research like this can be done only if long term databases have been established. (Reviewer-John S. Casko, DDS, MS, PhD).

© 2009, Oakstone Medical Publishing

Keywords: Malocclusion, Orthodontic Treatment, Tooth Wear

Print Tag: Refer to original journal article