The arch width obtained during palatal expansion is not stable long term.

**Background:** Maxillary expansion is a routine procedure performed to correct narrow maxillary arch width and posterior cross-bite. We assume, as orthodontists, that our expansion will be stable long term, but is that assumption correct?

**Objective:** To evaluate the long-term changes in maxillary dental arch widths in patients who were treated with rapid maxillary expansion (RME) appliances followed by edgewise appliances.

**Design:** This was a retrospective analysis of the records of 41 patients who had been treated for maxillary constriction.

**Methods:** Maxillary dental casts were available at 4 time periods: before treatment, after maxillary expansion, after complete nonextraction orthodontic therapy, and approximately 5 years later. The maxillary intercanine, inter premolar, and intermolar widths were measured at all 4 intervals. These widths were then compared over time.

**Results:** The maxillary intermolar, inter premolar, and intercanine widths all increased during palatal expansion treatment. During the time of full-banded, edgewise orthodontic therapy, the intermolar, inter premolar, and intercanine widths decreased. After appliance removal, these widths continued to decrease, with the greatest decrease occurring in the intercanine width, which nearly reached its original pretreatment distance.

**Conclusions:** A significant amount of relapse occurs after RME during a second phase of orthodontics, as well as long term.

**Reviewer’s Comments:** I found the information in this study to be useful. I have had similar experiences in patients I have treated using RME followed by routine orthodontics. Long term, these arch widths tend to decrease with time. I believe it is probably due to the stretching of the palatal gingiva, which simply does not accommodate to these greater widths in all patients. It is good to be aware of this information before correction of posterior cross-bites and to consider long-term retention for patients who have been treated for significant palatal constriction. (Reviewer-Vincent G. Kokich, DDS, MSD).

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Keywords: Palatal Expansion, Relapse

Print Tag: Refer to original journal article
If you want to have an effective website to attract new patients, it must be warm and personable and be all about the patient's needs and concerns.

**Background:** The Internet has created a completely new way for people to find information. If prospective patients are looking for an orthodontic practice, they will most likely go on-line and look at the website of the practice. What are the characteristics of an orthodontic website that would most likely attract new patients?

**Objective:** To identify website factors that lead prospective patients to make appointments or, conversely, to reject a practice.

**Participants:** The sample for this study consisted of 10 potential orthodontic patients who were currently searching for an orthodontist.

**Methods:** Ten 1-hour remote online studies were conducted and recorded via telephone and the Internet. The 1-hour sessions were videotaped. As the participants viewed different orthodontic websites in their area, their comments and impressions were recorded, and the responses were statistically analyzed.

**Results:** In order for a website to be successful in attracting new orthodontic patients, the site must be warm and personal, it must be all about the patient's needs and concerns, and it must contain the content that prospective patients seek. Any photos of the doctor and his or her staff should be in informal clothing with a warm and caring expression presented by the doctor and each staff member. Websites with hobby themes such as sports or spaceships and websites that have autoplay music and autoplay animation were viewed as being negative. In order to be attractive, the website should contain not only photos of the doctor but also direct statements of the doctor's warm feelings toward the patients.

**Conclusions:** In order to be effective in attracting new patients, an orthodontic website must present a warm and personable image of both the doctor and each staff member.

**Reviewer's Comments:** This is the first study I have seen that evaluated the effectiveness of orthodontic websites, and I thought it was excellent. Apparently, prospective orthodontic patients are more attracted to informal and friendly photographs of the doctor and staff as opposed to more formal photographs. If you don't have a website, you should get one as soon as possible. If you do have a website, this article is a must read. (Reviewer-John S. Casko, DDS, MS, PhD).

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**Keywords:** Websites

**Print Tag:** Refer to original journal article
This retrospective study was not able to demonstrate improved success for secondary alveolar bone grafting with the addition of DBM to the grafting protocol.

**Background:** Cleft lip and palate is a common congenital defect affecting up to 1 in 500 births. If the clefting involves the alveolar bone, a secondary alveolar bone graft (ABG) is usually needed prior to canine eruption (at approximately 9 years of age). Traditionally, this graft comes from the iliac crest, but new allogenic bone source materials, such as demineralized bone matrix (DBM), are now being used.

**Objective:** To evaluate the success of ABG and to determine whether the use of DBM improves the results.

**Design:** Retrospective case series.

**Participants:** 103 patients treated at the University of Iowa over the past 20 years were included. Mean age at the time of ABG was 9 years. Of these subjects, 59% had unilateral cleft lip and palate, and 41% had bilateral clefting.

**Methods:** Patient charts were analyzed for clefting type, age at repair, complications, need for additional procedures, and the use of DBM.

**Results:** Overall, 23% of patients required additional revision surgery. Unilateral cleft repairs had a revision rate of 18%; approximately one third of these revisions were due to infection or trauma after the first procedure. Bilateral cleft repairs had a revision rate of 32%; approximately two thirds of these revisions were due to infection or trauma. No significant difference in outcome was found with the use of DBM.

**Conclusions:** Bilateral cleft repairs required a higher rate of revision surgery and were associated with a higher incidence of infection and trauma. This is likely attributed to greater mobility of the premaxilla. DBM showed no significant effect on the success rate in this relatively small sample.

**Reviewer’s Comments:** The authors were hopeful that the use of DBM in addition to the iliac crest bone would lead to greater success, but, at least in the sample available to date, no difference in success could be found. This may mean that the failures have more to do with factors such as infection or trauma rather than an inability to stimulate bone production. Perhaps it would be better to look for ways to improve postoperative hygiene and segment stabilization rather than look for more potent bone induction factors. (Reviewer-Brent E. Larson, DDS, MS).

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Keywords: Alveolar Bone Graft, Cleft Palate, Demineralized Bone Matrix

Print Tag: Refer to original journal article
Inexperienced surgeons have a significantly higher incidence of root contact during mini-implant placement than do experienced surgeons.

**Background:** Today, mini-implants have become a popular way to provide added anchorage during orthodontic treatment. Many orthodontists place their own mini-implants. What is the incidence of damage to adjacent roots during mini-implant placement by nonexperienced surgeons?

**Objective:** To investigate the frequency and pattern of root contact during drilling for mini-implant placement with an emphasis on 2 factors: surgery site and clinician's expertise.

**Design:** This was a laboratory experimental study involving 2 groups of practitioners: experienced and inexperienced surgeons. The experienced surgeons had a history of >2 years of placing mini-implants. The inexperienced surgeons had never placed a mini-implant.

**Methods:** Dental casts were constructed, and plastic teeth with roots were added in specific sites where mini-implants are routinely placed in the oral cavity. These sites were between the maxillary right and left second premolar and first molar, the mandibular right and left first and second molars, and the maxillary and mandibular right and left central incisors. A total of 192 mini-implants were placed by experienced surgeons in all sites, and a total of 240 were placed by inexperienced surgeons. The authors then disassembled the dental casts and examined each of the plastic roots of these teeth to determine the percentage of occurrence of root damage in both groups.

**Results:** The inexperienced operators generated a statistically significantly higher frequency of root contacts (21.3%) than did the experienced group (13.5%). For both groups, most root contacts occurred in the posterior regions. The most susceptible teeth to contact during the surgery were the maxillary right first molar and the mandibular left first molar.

**Conclusions:** Inexperienced surgeons have a 20% risk of damaging roots during micro-implant placement.

**Reviewer's Comments:** This was an extensive laboratory study. The authors went through an exhaustive laboratory exercise to gain this information. However, the results are valuable. Today, many orthodontists place their own mini-implants. Based on the results of this study, an inexperienced surgeon will have a 20% risk of damaging the root of the tooth. This means that 1 out of 5 cases will result in root damage. The experienced group had an incidence of somewhere around 10%, or 1 in 10 cases. (Reviewer-Vincent G. Kokich, DDS, MSD).

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Keywords: Microimplant Placement

Print Tag: Refer to original journal article
This article highlights important concepts of growth, smile aesthetics, and biomechanics to provide a useful clinical guide for treatment planning in the growing adolescent patient.

**Background:** Modern orthodontic treatment planning increasingly focuses on soft-tissue relationships and smile aesthetics. Simply obtaining an ideal occlusal result may no longer be acceptable if it compromises the smile. Proper knowledge of growth and development is important in treatment planning as the upper lip will lengthen during growth, covering more gingiva and incisor. The chin and nose develop anteriorly and vertically, especially during adolescence, which typically causes teeth to appear less prominent. Using these guidelines, a clinician can determine the vertical and anteroposterior positioning of incisors for proper aesthetics.

**Objective:** To review the background of soft-tissue treatment planning and to discuss methods of obtaining ideal incisor display.

**Design:** Expert opinion and case studies.

**Methods:** One-couple intrusion and extrusion arches using sectional mechanics.

**Results:** The following cases were discussed: an anterior open bite with insufficient incisor display treated using a maxillary extrusion arch; an anterior deep bite with excessive incisor display treated using a maxillary intrusion arch; and an anterior deep bite with insufficient incisor display treated using a maxillary extrusion arch and mandibular intrusion arch. Often clinicians do not consider extrusion of maxillary incisors with an anterior deep bite, which could, in fact, create more ideal facial aesthetics.

**Conclusions:** With proper knowledge of mechanics and accurate treatment planning, ideal incisor display can be created.

**Reviewer’s Comments:** This article provides concrete examples of how to use knowledge of soft-tissue growth and smile assessment to determine treatment goals, and then how to plan the proper biomechanics to achieve those goals. The many photographs nicely demonstrate the concepts that are discussed. This article would make an excellent review for the seasoned clinician or an excellent clinical introduction for the new orthodontist. (Reviewer-Brent E. Larson, DDS, MS).

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Keywords: Soft Tissue, Treatment Planning, Growth, Biomechanics

Print Tag: Refer to original journal article
The forces of commercially available nickel titanium closed coil springs vary greatly, and their advertised labeling is misleading.

**Background:** Orthodontists often use nickel titanium closed coil springs to assist in the closure of spaces within dental arches. These springs are available from different manufacturers and usually come in 9- or 12-mm lengths. However, do the forces between these different springs reflect the labeling that the manufacturers provide? In other words, does a light spring actually deliver a light force compared to a heavy spring?

**Objective:** To compare forces generated by 14 types of 9-mm nickel titanium closed coil springs provided by 5 orthodontic companies.

**Design:** This was a laboratory study.

**Methods:** The authors gathered 5 samples of 14 different 9-mm closed coil titanium springs. These were activated to 12 mm length, and then gradually deactivated to 9 mm, 6 mm, and finally 3 mm length. These activations were performed in a water bath at 37°C to duplicate the oral cavity. The amount of force delivered by the springs at each of these levels of activation was recorded.

**Results:** When the various springs were stretched to 12 mm, they delivered statistically significant different force levels. These ranged or varied from 147 to 474 g. In addition, when these springs were deactivated to the lesser length, the force levels also varied widely.

**Conclusions:** Nickel titanium closed coil springs vary greatly in the forces they generate during activation. The present labeling by manufacturers is confusing and may be misleading.

**Reviewer's Comments:** This information is illuminating. I was not aware that the forces generated by these springs varied so greatly. Basically, the authors are suggesting that we, as orthodontists, check the force that we are delivering to the teeth with these springs during our activations. If you want to produce a physiologic load on the tooth root, then the only way to do that predictably is by using a force gauge to check the amount of activation. (Reviewer-Vincent G. Kokich, DDS, MSD).

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**Keywords:** Coil Springs, Force

Print Tag: Refer to original journal article
Can Miniscrews Help Avoid Maxillary Surgery?

Mandibular Deviation and Canted Maxillary Occlusal Plane Treated With Miniscrews and Intraoral Vertical Ramus Osteotomy: Functional and Morphologic Changes.

Hashimoto T, Fukunaga T, et al;


Miniscrews can be very effective for unilaterally intruding maxillary posterior teeth to level a canted maxillary occlusal plane.

**Background:** Most patients who present with a vertical asymmetry of the maxilla and a lateral deviation of the mandible require both maxillary and mandibular surgery. Is it possible to avoid maxillary surgery by using miniscrews to level the maxillary occlusal plane?

**Objective:** The purpose of this case report article was to describe the treatment of a 16-year-old boy who presented with vertical asymmetry of the maxilla and horizontal and vertical asymmetry of the mandible.

**Methods:** Rather than using maxillary surgery to level the maxillary arch, the authors placed a miniscrew between the maxillary right first and second molars and a segmental arch to the maxillary right premolars and molars. An elastic was placed from the miniscrew to the segmental arch to intrude the maxillary right posterior teeth.

**Results:** A significant amount of intrusion was achieved, and the vertical asymmetry of the maxillary occlusal plane was corrected. After achieving the leveling of the maxillary occlusal plane, a mandibular intraoral vertical ramus osteotomy was performed to correct both the vertical and lateral asymmetry of the mandible. The patient's initial occlusion was Class III on the right and Class II on the left. Debanding records indicate that an ideal Class I occlusion was achieved. The authors also placed a maxillary transpalatal arch to the first molars in an attempt to avoid rolling the maxillary right posterior teeth buccally. The overall treatment time was 19 months. By leveling the maxillary occlusal plane with the miniscrew, the authors avoided the need to perform maxillary surgery, which was a major advantage to treating the patient in this manner.

**Conclusions:** Using a miniscrew to level a canted maxillary occlusal plane has the potential to avoid maxillary surgery for patients with vertical and lateral asymmetry.

**Reviewer's Comments:** The amount of maxillary posterior intrusion achieved using the miniscrew in this patient was very impressive. I should point out that this patient was an ideal candidate for this type of treatment because he had no anteroposterior or lateral discrepancies in the maxilla. If he had either of these, it would have been necessary to do maxillary surgery. It is also important to note that there was no long-term posttreatment follow-up for this patient. This would be a concern for me in a 16-year-old boy who may well have significant additional growth. (Reviewer-John S. Casko, DDS, MS, PhD).

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Keywords: Vertical Asymmetry, Miniscrews, Surgery

Print Tag: Refer to original journal article
Occlusal force and contact area were both increased after 4 weeks of gum chewing exercise, but the increases returned to baseline levels once the exercise was discontinued.

**Background:** Treatment of anterior open bite patients may consist of intrusion of posterior teeth to allow for mandibular auto-rotation. This upward rotation must be preserved during retention to prevent the open bite from recurring. Some advocate that the strength and duration of occlusal contacts must be increased to achieve this retention.

**Objective:** To examine the effects of daily chewing gum exercise on occlusal force, area, and pressure.

**Design:** Prospective clinical study.

**Participants:** 35 dental student volunteers with no severe malocclusions, missing teeth, or TMJ pathology. In addition, 5 adult volunteers were used as controls.

**Methods:** Occlusal forces and areas were measured using an Occluzer; participants used maximum effort to bite on an interocclusal film for 3 seconds. Measurements were repeated 5 times for each participant. Subjects were then given a 4-week supply of chewing gum to use for 10 minutes before or after each meal, for a total of 30 to 45 minutes a day. Occluzer measurements were repeated after the 4-week test period, and again 1 month after completion of the exercise program.

**Results:** Occlusal force and contact area both showed statistically significant increases after 4 weeks of gum chewing exercises. Average occlusal pressure did not increase. However, 1 month after the exercises, both occlusal force and area returned to near baseline levels.

**Conclusions:** Gum chewing exercises may lead to an increase in occlusal force and contact area, but the exercises must be continued long term.

**Reviewer's Comments:** This study indicates that it may be possible to affect occlusal contacts and occlusal force through exercise. There are several concerns with the study method, including the use of dental students as subjects and funding by the chewing gum company. In addition, the subjects were not treated open bite patients or even orthodontically treated subjects, so it is difficult to know whether the effects measured here would be present in a group of patients in whom they are really needed. An interesting clinical study would involve randomly assigning treated open bite patients to this protocol to determine if any difference in stability could be measured. (Reviewer-Brent E. Larson, DDS, MS).

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Keywords: Open Bite, Occlusion, Retention, Chewing Gum

Print Tag: Refer to original journal article
Missing Posterior Teeth and Risk of TMD

Missing Posterior Teeth and Risk of Temporomandibular Disorders.

Wang MQ, Xue F, et al:

J Dent Res 2009; 88 (October): 942-945

Missing posterior teeth in multiple quadrants in young females is highly correlated with TMD.

**Background:** Temporomandibular disorders (TMDs) are common among adult orthodontic patients. These disorders can range from pain to joint sounds to limited opening. There are many causes of TMD. However, one potential cause could be missing posterior teeth that do not provide good occlusal support. However, is that assumption true?

**Objective:** To analyze the relationship between the number and distribution of missing posterior teeth and TMD.

**Design:** This was a retrospective analysis of the records of 2 groups of adult subjects who were missing at least 1 posterior tooth for at least 6 months. Some individuals were missing posterior teeth in all 4 quadrants.

**Participants/Methods:** 741 individuals were examined and were divided into 2 groups. In the TMD group, the average age was 39 years, and each of these individuals had a history of TMD for at least 6 months. In the other group, adults of similar age were also missing posterior teeth but did not have a TMD history. The authors then analyzed 4 variables in these samples: gender, age, the number of missing posterior teeth, and the number of dental quadrants with missing posterior teeth.

**Results:** When the variables of the number of missing posterior teeth and the number of dental quadrants with missing posterior teeth function together, their effect on TMD increases, especially in young women.

**Conclusions:** Missing posterior teeth in multiple quadrants is associated with a higher prevalence of TMD, especially in young women.

**Reviewer’s Comments:** This is an excellent study. As orthodontists, we often treat adults who have missing posterior teeth prior to prosthetic reconstruction. Some of these individuals tend to have TMD. This study suggests that if the missing teeth are found in multiple quadrants, especially in young women, the lack of posterior occlusal support could be one of the reasons for the TMD. (Reviewer-Vincent G. Kokich, DDS, MSD).

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Keywords: Missing Posterior Teeth, TMD

Print Tag: Refer to original journal article
Delegation--A Great Stress Reliever

The Benefit of Delegation.

Levin RP:

J Am Dent Assoc 2009; 140 (December): 1541-1542

Delegating responsibility to your staff relieves stress and allows you to run a more effective practice.

**Background:** Many orthodontists feel stressed out and tired at the end of the day because they fail to effectively delegate responsibility to their staff members. If you decide that you want to relieve some of the stress from your practice by delegating more responsibility to your staff members, what principles should you follow to make sure this increased delegation is effective?

**Objective:** The objective of this guest presentation article was to discuss not only the need for effective delegation in your practice but also how to achieve it. **Discussion:** If you want to make your practice more productive and efficient, it is essential to delegate responsibilities to your staff members. It is amazing how many tasks staff members can learn to do effectively if they receive proper training. In this article, Dr. Levin suggests that you consider making time to train team members in your practice as an investment. If you decide to delegate more responsibility and tasks to your staff, there are certain things you need to consider. It is important to identify the skill level of team members and assign tasks accordingly. You also need to maintain an environment of open communication in which questions and answers can be shared. It is important to be clear with your directions to avoid assumptions and to create a progress-reporting system before you delegate any task. Dr. Levin strongly emphasizes that successful delegation is not about handing off a task to a staff member but, more importantly, is about achieving a result. Therefore, it is critical that the staff member have a clear understanding of both the task and the expected result. If you assign a new task to a staff member, there should be a deadline in achieving the result that is agreed upon by both you and the staff member.

**Conclusions:** Creating an effective system for delegation in your practice can allow your practice to run more efficiently and effectively.

**Reviewer’s Comments:** I found the suggestions in this article to be very practical. It is amazing what staff members can achieve if they are properly trained, motivated, and provided with a little constructive feedback when they achieve a new task. It always impresses me to see the huge difference in the level of service provided by similar businesses such as fast food restaurants or hotels. I am convinced that, in most cases, the difference is due mainly to an effective training system that allows employees to work more effectively.

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

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Keywords: Delegation

Print Tag: Refer to original journal article
In this small pilot study, there was a trend to see more enamel demineralization around brackets ligated with elastic ligatures compared to those ligated with steel ligatures, but the small sample size did not make this difference statistically significant.

**Background:** Enamel demineralization around brackets is a common adverse effect of orthodontic therapy if oral hygiene is not maintained. While demineralization around orthodontic appliances has been frequently studied, few studies have examined the effects of different methods of ligation. In situ models have been accepted in cariology research when clinical trials are not feasible.

**Objective:** To determine the effectiveness of an in situ method of testing the demineralization risk of different ligation methods.

**Design:** Pilot, split-mouth prospective study.

**Participants:** 4 healthy adults (2 males, 2 females; mean age, 27 years).

**Methods:** A removable palatal appliance was created with a recessed block of bovine enamel placed on each side of the arch. Three brackets were bonded with Concise resin to each block. A 0.016" stainless steel archwire was ligated with elastomeric rings on one side and stainless steel ties on the other. The appliance was worn for 14 days, during which the appliance was brushed, except for the brackets and archwire. Additionally, 20% sucrose was dripped onto the appliance 8 times a day.

**Results:** No statistically significant differences in biofilm weight, total bacteria, mutans streptococci counts, lactobacilli counts, or enamel demineralization were found between the 2 methods of ligation. However, elastic ligatures showed a trend toward increased demineralization that may be significant with an increased sample size.

**Conclusions:** Further in situ testing using this method may be beneficial in examining demineralization risk with different brackets and ligatures.

**Reviewer's Comments:** This is an interesting way to study decalcification that doesn't risk a subject's own enamel and yet allows testing in an actual oral environment. The challenge is that it doesn't test the subject's ability to clean around the brackets with different types of ligation. The authors claim that the differences seen would have been significant if they had a sample size of 10 rather than 4, but that claim still needs to be tested before any trend can be verified as real. (Reviewer-Brent E. Larson, DDS, MS).

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Keywords: Decalcification, Ligation, White Spots

Print Tag: Refer to original journal article
Risk Factors for Peri-Implantitis

Comparison of Five Parameters as Risk Factors for Peri-Implant Mucositis.

Karbach J, Callaway A, et al:


Smoking is the greatest risk factor for peri-implantitis.

Background: Implants have been used for many years to replace missing teeth. Some of these teeth are missing because of periodontal disease. Can implants be affected by peri-implantitis?

Objective: To evaluate 5 parameters (roughness of the implant surface, smoking, augmentation at the implant site, presence of residual teeth, and radiation therapy) as possible risk factors for the development of peri-implant inflammation.

Design/Participants: This was a retrospective design of 100 patients who had had at least 1 implant placed and had been followed for at least 1 year after placement.

Methods: Initially, the researchers evaluated all implant sites to determine if peri-implantitis was present. Then, in those where bleeding upon probing was found, the authors determined if the 5 aforementioned parameters could be found to influence the degree of peri-implantitis.

Results: Results of this study showed that approximately 33% of the subjects had peri-implantitis. The authors clearly found that smoking was the most common variable that shows statistically significant correlations with clinical signs of peri-implantitis. In addition, some of the patients had undergone radiation therapy for tumors. This was the second most common factor that was implicated with peri-implantitis. The authors did find that implant surface roughness, augmentation of the implant site, and type of dentition had a little influence on the clinical signs of inflammation of the peri-implant tissue.

Conclusions: Smoking and radiation therapy are the 2 greatest risk factors for peri-implantitis after implant placement.

Reviewer's Comments: Although this article is >6 months old, we, as orthodontists, do not often have the opportunity to evaluate literature that discusses subjects that our patients encounter after orthodontic treatment. Many of our adult patients have implants placed. As was shown in this study, approximately one third of these patients will experience peri-implantitis. It was interesting that smoking and radiation therapy were the most common risk factors for the development of peri-implant inflammation. (Reviewer-Vincent G. Kokich, DDS, MSD).

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Keywords: Peri-Implantitis, Risk Factors

Print Tag: Refer to original journal article
Both conventional and super slick elastomeric ligatures lose about one-third of their potential load after being in the mouth for six weeks.

**Background:** Elastomeric ligatures are routinely used in orthodontics to secure arch wires to brackets. Since sliding mechanics are common during orthodontics, super slick elastomeric ligatures have been marketed and claim to reduce the friction on the arch wire. However, most studies on the use of these elastomeric ligatures have been performed in a laboratory. An in vivo study is necessary to determine what happens in the oral cavity to the friction and physical properties of these ligatures.

**Objective:** To investigate the changes in failure load and static friction of conventional and super slick elastomeric ligatures that had been placed in the oral cavity for up to 6 weeks.

**Design:** An experimental study that was performed both in vivo and in vitro.

**Methods:** Initially, 4 brackets were placed on 4 premolars in 4 quadrants on 9 individuals. A combination of either conventional or elastomeric ligatures was placed on these brackets and to remain in the oral cavity for 24 hours, 48 hours, 1 week, 2 weeks, 4 weeks, or 6 weeks. Following removal at each of these time intervals, the failure load and static friction were tested using an Instron testing machine. The conventional and super slick elastomeric ligatures were compared over each of these time intervals.

**Results:** The results of this study showed that the failure load for conventional ligatures was reduced to 67% of its original value at 6 weeks, and the failure load of the super slick elastomeric ligatures was reduced to 63% after 6 weeks. In other words, the failure load changes were similar between both groups. In addition, the static friction between these 2 ligatures showed no difference after being in the mouth for 6 weeks.

**Conclusions:** Super slick elastomeric ligatures do not reduce static friction when they have been in the mouth for 6 weeks compared to conventional ligatures.

**Reviewer’s Comments:** Although other studies have also claimed that super slick elastomeric ligatures are not more effective at reducing static friction, these previous studies were performed in vitro. I appreciated the authors’ efforts at trying to make this as clinically applicable as possible by placing these ligatures in the mouths of patients for up to six weeks prior to testing the effects on failure load and static friction. (Reviewer-Vincent G. Kokich, DDS, MSD).

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**Keywords:** Elastomeric Ligatures, Super Slick

**Print Tag:** Refer to original journal article
Accelerating the Repair of Pulpal Tissue

Effects of Low-Level Laser Therapy and Orthodontic Tooth Movement on Dental Pulps in Rats.

Abi-Ramia LBP, Stuani AS, et al:

Angle Orthod 2010; 80 (January): 116-122

Low-level laser therapy during orthodontic tooth movement accelerates pulpal tissue repair.

Background: It has been well-known for years that orthodontic tooth movement causes secondary damaging effects on the pulpal tissue in patients. However, in most situations, this pulpal tissue regenerates and repairs itself. It is also known that low-level laser therapy has a positive effect on bone remodeling, cell function, and fibroblast proliferation. Would low-level laser therapy have an effect on pulpal health and repair during orthodontic treatment?

Objective: To describe microscopically the pulpal reactions resulting from orthodontically induced tooth movement associated with low-level laser therapy.

Design: Experimental study performed in laboratory animals.

Methods: 3 groups of animals were used in this study. In one group, the maxillary right first molars were moved mesially using a coil spring. In a second group, the same orthodontic movement was performed, but low-level laser therapy was applied at 4 seconds on the buccal, palatal, and mesial aspects of the tooth. In group 3, no tooth movement was performed, and these animals were the controls. Then, the pulpal tissue was evaluated at 12 hours, 24 hours, 3 days, and 7 days after the orthodontic movement.

Results: The results of this study showed that in both groups that underwent orthodontic treatment, there were significant cellular changes in the pulps of these teeth due to the orthodontic movement. However, these authors clearly showed that animals that received laser therapy had a quicker repair of the pulpal cells than those that simply underwent orthodontic treatment.

Conclusions: The authors conclude that orthodontically induced tooth movement associated with low-level laser therapy produced an increase in the vascularity, and this factor could accelerate pulpal tissue repair during orthodontic treatment.

Reviewer's Comments: This was an interesting study. Companies who market lasers propose that these devices can be used to accelerate orthodontic tooth movement and to prevent secondary painful responses during tooth movement. I had not been aware of any studies that evaluated pulpal health. Although most pulpal damage that occurs during orthodontic treatment is repaired by the body itself, apparently, this study shows that the use of lasers can accelerate that repair. But, is it really worth using a laser to perform a treatment that does not need to be accomplished in a patient following tooth movement? (Reviewer-Vincent G. Kokich, DDS, MSD).

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Keywords: Laser Therapy

Print Tag: Refer to original journal article
The measurement of incisor inclination to the occlusal plane obtained from dental casts is reliable and may be able to substitute at times for a cephalometric film.

Background: Achieving proper incisor inclination is an important treatment goal for proper function and esthetics. This inclination is commonly measured from a lateral cephalogram. If incisor inclination could be measured reliably from dental casts, a reduction in radiation exposure may be possible in some instances.

Objective: To compare measurement of incisor inclination on dental casts to cephalometric assessment.

Participants: 39 Caucasians (12 males, 27 females; mean age, 19.5 years) were included. Patients with morphological tooth anomalies, incisor restorations, missing teeth, or previous orthodontic therapy were excluded. Patients all had Class I occlusion and a normal incisor relationship as assessed by 3 orthodontists.

Methods: Incisor inclination, crown axis, and root axis were measured cephalometrically in relation to the occlusal plane perpendicularly. Incisor inclination was also measured on casts using a custom-made gauge, utilizing a measuring table with a protractor attached.

Results: An overall difference of 0.02° was found between radiographic third order inclination and cast assessment in the maxilla. The difference in the mandible was just under 3°. The crown-root angle was 178° on average, showing that the crown and root inclination typically align well.

Conclusions: Sufficient reliability was shown for both cephalometric and cast analysis with little clinical difference between the two.

Reviewer's Comments: This is a complex article that is not easy to understand. For me, the important message is that similar information about incisor inclination can be gained from dental casts and from cephalograms. This may mean that direct model measurements may be able to substitute for a radiograph in situations where the radiograph would be taken only to assess incisor inclination. (Reviewer-Brent E. Larson, DDS, MS).

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Keywords: Third Order Measurements, Incisor Inclination, Radiation Exposure

Print Tag: Refer to original journal article
Clear elastic ties from all manufacturers tested discolored from a combination of chemical degradation (early) and continuous staining (throughout).

**Background:** The demand for more esthetic orthodontic options is increasing, especially as more adults seek orthodontic care. While current ceramic brackets can be quite esthetic and stain resistant, clear elastic ligatures are prone to discoloration over time. However, it is unknown whether this discoloration is due to chemical degradation, simple staining, or both.

**Objective:** To quantify the discoloration of 3 different clear elastic ligatures over time in different immersion solutions.

**Design:** In vitro laboratory test.

**Methods:** Plastic ligatures (American Orthodontics [AO]), Power 'O's 012 (Ormco [OC]), and Dispense-A-tie (TP Orthodontics [TP]) were tested. These ligatures were stretched to represent clinical use and then immersed in 1 of 3 solutions: distilled water (control), 75% ethanol (chemical degradation), and 2% methylene blue (simple staining). Calibrated digital images were taken, and 4 areas on each image were randomly selected to examine color change for up to 5 days. Color change was determined using a scale where a distinct color mismatch was visible at anything >5.

**Results:** Color change ranges from 0.6 to 30.0 for OC, 1.1 to 18.8 for TP, and 1.0 to 20.0 for AO were found. Chemical degradation mainly occurred in the first few hours, while simple staining increased for the duration of the study.

**Conclusions:** In this study, OC showed the greatest discoloration, with AO and TP being roughly equal. However, this may not be a clinically significant difference. Further research is needed to quantify these differences, but analysis of properly calibrated digital images appears to be a valid method for examination of ligature discoloration.

**Reviewer's Comments:** There were more similarities than differences when comparing the color changes of the clear elastic ligatures from 3 different companies. Specimens from all manufacturers stained beyond the threshold value of 5, indicating a distinct color mismatch. The fact that the staining increased continually is good information for patients to understand so they limit exposure to coffee, tea, and cola. (Reviewer-Brent E. Larson, DDS, MS).

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Keywords: Discoloration, Elastomeric Modules, Esthetic Appliance

Print Tag: Refer to original journal article
Although there is ongoing debate regarding the prophylactic removal of third molars, this study suggests that lower third molars that are mesially tipped and near the occlusal plane increase the risk of distal caries on the second molars.

**Background:** The prophylactic removal of third molars is a topic under constant debate. Many reasons have been cited to remove third molars (caries, pericoronitis, periodontal concerns, etc), yet the incidence of distal caries on mandibular second molars has not been extensively studied.

**Objective:** To analyze risk factors relating to the development of caries on the distal of mandibular second molars.

**Design:** Retrospective case series.

**Participants:** 786 patients (883 molars) seen for third molar removal at Samsung Medical Center (Korea).

**Methods:** Caries detection was done using a mirror and explorer immediately following third molar removal. Radiographs were used to determine the mesial angulation of the mandibular third molar, the degree of impaction (Pell-Gregory method), and the distance from the distal cementoenamel junction (CEJ) of the second molar to the mesial CEJ of the third molar. Pearson chi-squared test was used for analysis.

**Results:** 17.2% of cases had caries on the distal of a mandibular second molar. Significant increases in caries risk were found when the neighboring third molar had a mesial angulation between 40° and 80°, an impaction level of A (portion of the third molar above the occlusal plane), and a distance of 7 to 9 mm between CEJs.

**Conclusions:** Mandibular third molars falling into these criteria may increase the caries risk on adjacent second molars and, therefore, may be candidates for prophylactic removal.

**Reviewer's Comments:** Orthodontists are frequently called upon to give opinions regarding the possible need for removal of third molars. The specific risk factors determined from this study can give further objective evidence on which to base your opinion. (Reviewer-Brent E. Larson, DDS, MS).

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Keywords: Third Molars, Caries, Prophylactic Removal, Risk Factors

Print Tag: Refer to original journal article
Cephalometric Measurements Are Poor Way to Evaluate Facial Attractiveness

Background: Orthodontists have traditionally used a number of cephalometric measurements to evaluate facial attractiveness. If you compared these cephalometric measurements with evaluations of facial attractiveness based on photographs would there be a high correlation between the 2 methods of evaluating facial attractiveness? As a practicing orthodontist, it is important to be able to answer this question.

Objective: To determine if cephalometric measurements of facial attractiveness correlate highly with evaluations of facial attractiveness based on photographs.

Participants: 45 U.S. and 48 Chinese adolescent patients.

Methods: 25 Chinese and 20 U.S. orthodontists ranked the photographic attractiveness of each patient. The photographic attractiveness rankings were then statistically correlated with 21 measurements from cephalometric radiographs taken at the same time as the photographs.

Results: There was a low correlation between the 21 cephalometric measurements and the photographic attractiveness rankings. No combination of cephalometric measures for either ethnicity accounted for >42% of the variance in photographic attractiveness rank, which left >50% of the variance unexplained. Some cephalometric measurements commonly believed to be indicators of facial attractiveness, such as the SN-pogonion angle, lower incisor to mandibular plane angle, and Wits appraisal did not show a correlation with facial attractiveness rank for either the U.S. or Chinese population.

Conclusions: Most of the information that people use to evaluate facial attractiveness is not available on lateral cephalometric radiographs.

Reviewer's Comments: This was an interesting study, and I must admit that the results did not surprise me. Considering all the variables that affect facial attractiveness, it should not be surprising that an individual or combination of cephalometric measurements would not be highly correlated with facial attractiveness. I believe the results of this study support the growing trend in orthodontics to place less reliance on cephalometric measurements and more on a clinical evaluation of facial esthetics. (Reviewer-John S. Casko, DDS, MS, PhD).

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Keywords: Cephalometric Measurements, Photographic Measurements, Correlation

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Maxillary First Premolar Extraction Is More Efficient for Class II Correction

Effects of the Pendulum Appliance, Cervical Headgear, and 2 Premolar Extractions Followed by Fixed Appliances in Patients With Class II Malocclusion.

de Almeida-Pedrin RR, Henriques JFC, et al:


Treatment time is shorter when premolar extraction is compared to pendulum appliance or headgear treatment for Class II correction.

**Background:** Use of the pendulum appliance, headgear, and extraction of maxillary premolars are all acceptable ways to treat Class II malocclusions. Does any of these 3 ways achieve a better occlusal result or produce more efficient treatment? Knowing the answer to this question would be helpful for orthodontists planning Class II correction.

**Design/Objective:** This retrospective study compared the effects of the pendulum appliance, cervical headgear, and 2 premolar extractions combined with fixed appliance treatment.

**Participants:** 82 patients with Class II malocclusion.

**Methods:** The sample of patients was divided into 3 groups. Group 1 consisted of 22 patients who were treated with the pendulum appliance. Group 2 consisted of 30 patients treated with cervical headgear, and Group 3 consisted of 30 patients treated with 2 maxillary premolar extractions. The treatment for the patients in all 3 groups was followed by fixed appliance treatment. Serial cephalometric measurements and dental casts were used to document treatment results. Both a treatment priority index (TPI) and a treatment efficiency index (TEI) were used to evaluate the treatment results.

**Results:** All 3 groups showed similar cephalometric effects as a result of treatment. All 3 groups also showed changes primarily in the maxillary dentoalveolar area and dental relationships. Occlusal outcomes were similar among the groups. The treatment profiles for the 3 groups were similar with the exception that the patients in the extraction group had slightly more retrusion of the upper lip. The results of the TEI indicated that the extraction group had more efficient treatment.

**Conclusions:** The effects of treatment with the pendulum appliance and cervical headgear and extraction of 2 maxillary premolars associated with fixed appliances are generally similar from both occlusal and cephalometric standpoints.

**Reviewer's Comments:** The results of this study did not surprise me with the exception of the slightly greater retrusion of the maxillary lip in the extraction group. I suspect that this might be a result of the extraction group having greater maxillary dental protrusion at the start of treatment because all 4 groups were treated by non-extraction in the mandibular arch, which should not have resulted in greater mandibular incisor retrusion in the extraction group, which determines the amount of maxillary incisor retrusion. (Reviewer-John S. Casko, DDS, MS, PhD).

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Keywords: Pendulum Appliance, Cervical Headgear, Premolar Extraction, Class II Malocclusion

Print Tag: Refer to original journal article
Patient, Not Parent, Desire for Tx Predicts Patient Cooperation


Daniels AS, Seacat JD, Inglehart MR:


Identifying an adolescent patient's desire for orthodontic treatment can help predict their cooperation during treatment.

Background: I am sure you have seen adolescent patients in your practice who have been very cooperative with treatment and others who have been very uncooperative. Wouldn't you like to have a tool to identify the uncooperative patients ahead of time? It appears that identifying a patient's motivation for treatment may let you do this.

Objective: To compare the motivation for orthodontic treatment of child and adolescent patients and their parents with the patient's cooperation during treatment.

Participants: The sample for this study consisted of 227 child and adolescent patients, 144 of whom were undergoing orthodontic treatment and 83 who were surveyed at their pre-orthodontic screening appointment.

Methods: 4 different surveys were developed to evaluate the patients' and parents' motivation for orthodontic treatment. Two surveys were for patients and parents who had not yet started orthodontic treatment and 2 surveys were for the patients who were undergoing orthodontic treatment and their parents. The surveys asked both patients and parents to identify how much they wanted to have braces and the importance of having braces. The results of the surveys were then statistically analyzed.

Results: Parents reported greater motivation for the children to have orthodontic treatment than did the children. This was particularly true for parents whose children were already in treatment. Patients who had higher treatment motivation reported a higher level of cooperation with their orthodontists' treatment recommendations. However, the parent's motivation for their child to have orthodontic treatment was not significantly correlated with their children's treatment cooperation.

Conclusions: Cooperation during orthodontic treatment is more closely related to the patient's motivation for treatment versus the parent's motivation.

Reviewer's Comments: The surveys used in this study did not seem to be very complicated. I did not find it surprising that cooperation during treatment was more closely related to the patient's motivation versus the parent's motivation. On a number of occasions, I have refused treatment for patients who clearly did not want treatment, but were simply being forced by their parents to seek treatment. When you make a decision not to treat a patient like this, you probably will never know what a good decision it was. However, if you make a decision to treat them, you will know every month what a bad decision you have made. (Reviewer-John S. Casko, DDS, MS, PhD).

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Keywords: Orthodontic Treatment, Motivation, Cooperation

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