Resorbable fixation plates are highly effective at stabilizing the jaw fragments after orthognathic surgery.

**Background:** In the past 20 years, rigid fixation has become common after orthognathic surgery. Before this time, wire fixation (or semi-rigid fixation) was used. With rigid fixation, titanium screws and plates are used to secure the bones, but these must be left in the bone after the surgery. Recently, researchers have been developing resorbable plates and screws. However, are these resorbable materials effective at stabilizing the bones after surgery?

**Objective:** To compare the use of titanium fixation plates and resorbable fixation plates after orthognathic surgery.

**Design/Participants:** This was a retrospective evaluation of 272 patients who had undergone orthognathic surgery at Chosun University Hospital in South Korea. The average age of the sample was 23 years.

**Methods:** In one group, resorbable plates and screws were used to stabilize the bony fragments. In the other group, traditional titanium plates and screws were used. A combination of Le Fort I osteotomy, sagittal split ramus osteotomy, and genioplasty were common in both groups.

**Results:** When the authors re-evaluated the patients, the success rate was 98%. Of those who received a titanium plate, 8.6% developed complications. Of the patients who received resorbable plates, 18.3% developed complications. Although the number of complications was low, a greater degree of postoperative open bite and a trend toward relapse were observed in patients in whom the resorbable fixation plates were used. In addition, postoperative infection occurred in patients who had received resorbable fixation plates.

**Conclusions:** Even though some problems occurred, the authors believe that the strength of the resorbable fixation plates is strong enough to provide adequate stability after orthognathic surgery. The authors believe that resorbable fixation plates can be used as a substitute for titanium fixation plates in selected patients.

**Reviewer’s Comments:** Although the authors were positive about resorbable plates, there were complications; however, I believe these occurred more often in open bite subjects. In their conclusions, the authors state that resorbable plates could be used in selective patients, perhaps not those who show open bite tendencies. (Reviewer-Vincent G. Kokich, Sr, DDS, MSD).

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Keywords: Resorbable Plates

Print Tag: Refer to original journal article
It is not reasonable to expect a spontaneous Class II correction by simply expanding the maxillary arch.

**Background:** Some clinicians have suggested that simply expanding the maxillary arch in growing patients will lead to a spontaneous Class II correction, which has been referred to as the "foot in the shoe" theory. Is this theory valid? If you are going to appropriately treat your growing Class II patients, you should know the answer to this question.

**Objective:** To determine whether maxillary expansion causes spontaneous correction or improvement of a Class II malocclusion.

**Participants:** The sample for this study consisted of 13 Class II patients with a mean age of 10 years, 3 months. All patients had rapid maxillary expansion that was left in place for approximately 6 months.

**Methods:** Articulated models were mounted before treatment and at the end of expansion in both centric occlusion and maximum intercuspation. Condyle position indicator recordings were also made. Changes in molar relationships were statistically analyzed.

**Results:** In 7 subjects, the Class II relationship improved, with the maximum improvement being 2 mm. In 5 subjects, the Class II malocclusion worsened, and in 1 subject, it stayed the same. Because only about half of the patients in the sample had any improvement and 5 actually developed a worse Class II malocclusion, the authors concluded that the "foot in the shoe" theory was not valid.

**Conclusions:** Rapid palatal expansion does not result in spontaneous Class II correction.

**Reviewer's Comments:** Even though this study had a small sample, I was not surprised by the results. Wouldn't it be nice if all you had to do to correct Class II malocclusions in growing patients would be to expand the maxillary arch? Unfortunately, growth has a much greater effect on Class II correction, and the results of this study could clearly be explained as growth variation. This is another example of what appears to be a logical theory having no scientific basis. (Reviewer-John S. Casko, DDS, MS, PhD).

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Keywords: Class II Correction, Rapid Palatal Expansion, Spontaneous Correction

Print Tag: Refer to original journal article
This study using virtual treatment simulation found that using a fixed vertical distance for bracket placement resulted in poor marginal ridge relationships with a straight arch wire.

**Background:** Ideal bracket placement at the initial bonding appointment is important for efficient orthodontic treatment. Good placement allows for correct expression of the built-in prescription and, therefore, time savings during finishing. Different prescriptions and different methods of bracket placement are advocated, but these all attempt to achieve an ideal orthodontic result. A commonly suggested placement method relies on a prescribed vertical distance from the incisal edge or cusp tip.

**Objective:** To determine if using a bracket placement protocol with fixed vertical distances from the incisal edges and cusp tips was able to level marginal ridge heights.

**Design:** Laboratory study using computer simulation of 47 randomly selected digitized models of Class I or Class II malocclusions.

**Methods:** OrthoCAD software was used to create virtual set-ups with MBT Victory Series 0.022" brackets (3M). Brackets were placed at a prescribed distance from the incisal or cusp tip, as recommended by McLaughlin et al. A simulation was run using a 0.019" x 0.025" final arch wire. The ABO software tool in OrthoCAD was used to measure marginal ridge height before and after the simulated treatment.

**Results:** Most marginal ridge height relationships deteriorated during the simulated treatment. This was statistically significant ($P < 0.05$) and clinically significant (>0.5 mm) between the upper first and second premolars and between the lower first and second molars. Between 5.1% and 33.4% of the cases, depending on which marginal ridges were examined, moved from an ABO acceptable relationship to a discrepancy >0.5 mm.

**Conclusions:** The biological variability in crown height and facial contour was judged by the authors to play an important role. Solely placing brackets using set measurements from the incisal or occlusal surfaces may lead to marginal ridge discrepancies in the final result.

**Reviewer's Comments:** This study was done using virtual treatment simulation to determine the final position of the teeth, and this method has never been fully validated against actual clinical treatment. Even so, the surprising outcome was that more marginal ridge relationships became worse than better, indicating that teeth were moving in the wrong direction. The marginal ridge discrepancies may also be the result of flawed angulation placement of the virtual bracket placement tool in the software since poor angulation could also induce these discrepancies. The truth is that no bracket can work in all situations, and some wire bending or bracket relocation will always be needed to have marginal ridge alignment. (Reviewer-Brent E. Larson, DDS, MS).

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Keywords: Straightwire, Bracket Placement, Treatment Outcome

Print Tag: Refer to original journal article
How Does Disc Repositioning Surgery Affect TMJ Long Term?

20-Year Follow-Up Study of Disc Repositioning Surgery for Temporomandibular Joint Internal Derangement.

Abramowicz S, Dolwick MF:

J Oral Maxillofac Surg 2010; 68 (February): 239-242

After 20 years, the majority of patients report a significant reduction in pain after disc repositioning surgery of the TMJ.

**Background:** A common problem of the TMJ is internal derangement. This involves displacement of the temporomandibular disc during opening and closing movements of the mandible. Although most individuals simply live with this problem and tolerate it well, in some situations, disc displacement can limit mouth opening and cause significant pain. One of the options for treating significant disc displacement with limited opening is disc repositioning surgery. What is the long-term effect of disc repositioning?

**Objective:** To report the 20-year follow-up outcomes of TMJ disc repositioning as a surgical treatment for TMJ internal derangement.

**Design/Methods:** This was a retrospective chart review of patients who had undergone TMJ disc repositioning surgery for the treatment of internal derangement from 1984 to 1990. These patients had been symptomatic for >5 years, and improvement without surgical intervention was deemed unlikely. More than 150 patients had undergone surgery, and these patients were recalled. A total of 18 patients (11.8%) were located and contacted, and agreed to complete a questionnaire.

**Results:** There was a significant reduction in joint pain at rest. Before surgery, the average pain level was 9 on a scale of 1 to 10, with 10 being the worst. After 20 years, the average joint pain at rest was 1 on a 10-point scale. Therefore, there was a 77% reduction in TMJ pain at rest. Overall, 94% of the patients reported an improvement in their overall quality of life, which included improvement in the ability to eat certain foods, a reduction in pain, and an improvement in functional limitations.

**Conclusions:** Disc repositioning surgery, although it is a last resort, is an effective and successful surgical treatment for TMJ internal derangement. This success was maintained for 20 years.

**Reviewer’s Comments:** This is good information for orthodontists. Occasionally, we encounter patients who have internal derangement and have significant pain and limited opening. It is good to know that, in the hands of a capable surgeon, disc repositioning surgery can be a viable treatment for these types of patients. (Reviewer-Vincent G. Kokich, Sr, DDS, MSD).

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Keywords: Disc Repositioning Surgery, TMJ Internal Derangement

Print Tag: Refer to original journal article
This study found a high prevalence of airway obstacles in mouth breathers, such as large adenoids, sinusitis, pneumatized concha, and deviated septum.

**Background:** Chronic mouth breathing in a pediatric patient may lead to serious future problems, such as morphological changes in the masticatory system and increased risk of obstructive sleep apnea. Commonly, obligatory mouth breathing is associated with enlarged adenoids, yet other mechanical and inflammatory obstacles may be present.

**Objective:** To determine mechanical and inflammatory changes in pediatric mouth breathers using CT.

**Design:** Prospective clinical trial.

**Participants:** 67 children (35 females and 32 males) between 10 and 15 years of age who were undergoing brain CT for reasons other than sinusitis. Patients who had previous sinus surgery, facial trauma, craniofacial anomalies, or systemic disorders were excluded.

**Methods:** An additional paranasal CT was taken at the time of the brain CT. The images were read by an experienced radiologist for anatomical variations and inflammatory changes. Parents were asked to complete a questionnaire on the child's breathing behaviors while awake and asleep. Additionally, a clinical examination was performed on each child to assess lip competence, incisor show at rest, and nose breathing capability (examiner closed the patient's lips together for 2 to 5 minutes with light pressure).

**Results:** Patients who were deemed mouth breathers by the clinical examination and patient history showed increased rates of hypertrophied adenoids (87%), maxillary sinusitis (77%), pneumatized middle concha (74%), and deviated nasal septum (55%). However, 9.6% of mouth breathers had a completely normal CT. None of the mouth breathers showed a competent lip seal compared to 86.1% of nasal breathers. Finally, mouth breathers showed a higher percentage of cases with only partial lip coverage of the incisors or gingival exposure at rest. All of these changes were statistically significant.

**Conclusions:** Enlarged adenoids play an important role in mouth breathing, but other anatomical and inflammatory changes are important as well. Some cases of obligatory mouth breathing appear to be the result of habit, as no airway impingement could be found on CT.

**Reviewer's Comments:** The association between the CT scan features and mouth breathing does not, in itself, imply causation. The authors point out that some of the sinusitis and other inflammatory findings could be a result of the mouth breathing and not a cause. It will be interesting to see whether we can view some of these same mechanical and inflammatory obstacles on the CBCT images taken on orthodontic patients, and whether this new information will lead to better understanding of the development of mouth breathing. (Reviewer-Brent E. Larson, DDS, MS).

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Keywords: Mouth Breathing, Nasal Obstruction, CT

Print Tag: Refer to original journal article
Crib Therapy Affects Tongue Pressure

Tongue Pressure Changes Before, During, and After Crib Appliance Therapy.

Taslan S, Biren S, Ceylanoglu C:

Angle Orthod 2010; 80 (May): 533-539

Crib therapy results in significant alterations in tongue pressure.

**Background:** A common treatment for anterior open bite is to place a tongue crib. This appliance will prevent the tongue from moving anteriorly, at rest and during swallowing. This should allow for teeth to erupt and correct the open-bite problem. However, what happens to the actual tongue pressure during this time? Is there a permanent alteration in tongue pressure, or is it temporary?

**Objective:** To investigate tongue pressure during rest position and swallowing before and after crib appliance therapy in growing subjects with anterior open bite.

**Design/Participants:** This was a prospective trial using 19 patients who had anterior open bite in the mixed dentition.

**Methods:** The sample was divided into 2 groups. The study group consisted of 13 subjects who underwent 10 months of crib appliance therapy. The control group consisted of 6 patients who had anterior open bites but did not receive a tongue crib. Tongue pressure measurements in both the rest position and during swallowing were recorded in both groups before, after insertion of the crib, during crib therapy for 10 months, and then 2 months after the crib was removed. The control subjects had similar measurements made at the same time intervals. The pressure transducers to measure tongue pressure were placed in the anterior region behind the maxillary and mandibular incisors, and also on the molars in the maxillary arch.

**Results:** The anterior open bites closed significantly during the treatment period in the study group that received the crib. Resting tongue pressure on the crib appliance decreased in half at the end of the 10-month period. Swallowing tongue pressures also decreased significantly after 10 months. The differences in swallowing and resting tongue postures were statistically significant before and after treatment. Resting and swallowing tongue pressures remained essentially the same in the control group that did not receive a crib. Resting tongue pressures 2 months after removal of the crib remained lower than the initial values in the study group. Swallowing tongue pressures returned to baseline values in the study group 2 months after crib removal.

**Conclusions:** Significant decreases in resting and swallowing pressures using the crib appliance occurred in the study group, suggesting that the tongue adapts to the new position created by the appliance.

**Reviewer’s Comments:** I have used tongue cribs extensively to correct open bites in the mixed dentition and have found them to be very effective. This study helps one understand how the alteration occurs. Although swallowing tongue posture does not change, resting tongue posture certainly changes, and the change is maintained if the crib is worn for an extended period of time. This study has confirmed those observations. (Reviewer-Vincent G. Kokich, Sr, DDS, MSD).

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Keywords: Crib Therapy, Tongue Pressure

Print Tag: Refer to original journal article
Long-Term Correction of Dental Open Bite Is Relatively Stable

Orthodontic Treatment of Anterior Open-Bite Malocclusion: Stability 10 Years Postretention.

Zuroff J, Chen S-H, et al:
Am J Orthod Dentofacial Orthop 2010; 137 (March): 302.e1-302.e8

It is reasonable to expect some long-term increase in overjet when treating open-bite patients.

**Background:** Most orthodontists would agree that anterior open bites are very challenging to treat. If you treat a patient with an anterior open bite, how stable can you expect the changes to be? This information would be helpful in providing informed consent for your patients.

**Objective:** To evaluate the long-term stability of anterior open-bite treatment.

**Participants:** 64 subjects who were treated with orthodontics alone and had long-term post-treatment records.

**Methods:** The 64 subjects were subdivided into 3 groups. One group consisted of patients who had incisal contact; the second group had vertical overlap but no contact; and the third group had anterior open bite. Seven cephalometric measurements were used to evaluate long-term changes that occurred in the 3 groups, with the average post-treatment time being 14 years.

**Results:** All 64 subjects had positive incisal overlap at the post-retention visit. The long-term post-retention records indicated that the mean overbite deepened in all 3 groups, with the contact group experiencing a greater amount of overbite deepening than the open-bite group. Post-treatment overjet increased to a greater degree in the open-bite group than in the contact group.

**Conclusions:** Patients with anterior open bites are likely to experience a greater amount of overjet increase than patients who have incisal contact prior to treatment.

**Reviewer's Comments:** I was pleasantly surprised to see that all the patients in the open-bite group had positive overlap at the long-term retention visit. I would have expected that a significant number of these patients would have had some degree of open bite at the long-term visit. I was also surprised to see that mean overbite deepened in all 3 groups. I would not have expected this. The bottom line is that the long-term correction of anterior open bite in these subjects was much more stable than I would have expected.

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

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Keywords: Open-Bite Malocclusion, Treatment Stability

Print Tag: Refer to original journal article
Severe Malocclusion Affects Quality of Life

Quality of Life in Patients With Severe Malocclusion Before Treatment.

Rusanen J, Lahti S, et al:

Eur J Orthod 2010; 32 (February): 43-48

A group of Finnish subjects with severe malocclusion had quality-of-life oral impact severity score 7 times higher than the typical Finnish adult.

Background: Traditionally, dental research has focused more on quantitative clinician-driven outcomes rather than subjective patient-based measures. Although it is more difficult to analyze subjective concepts such as perceived functional status or psychosocial well-being, these concepts play an important role in providing patient-based care. A common instrument to measure the social impact of oral disorders is the Oral Health Impact Profile (OHIP) or its short form, OHIP-14. These measures ask questions related to dysfunction, discomfort, and disability; responses are given on an ordinal scale ranging from 0 (never) to 4 (very often). The OHIP-14 consists of 14 questions, so severity scores range from 0 to 56.

Objective: To determine the occurrence of oral health impacts among patients with severe skeletal malocclusions.

Design: Secondary analysis of data from a longitudinal study.

Participants: 170 patients (92 females and 59 males; mean age, 35.5 ± 11.5 years) with severe skeletal malocclusions who were awaiting care at Oulu University Hospital in Finland.

Methods: A clinical examination was performed on each patient to categorize the malocclusion (lateral crossbite, open bite, reverse overjet, or Class II malocclusion). A Finnish translation of the OHIP-14 was completed by each patient. The prevalence, mean extent, and severity scores were compared among malocclusion groups and between genders.

Results: Oral impacts perceived as "fairly often" or "very often" had a prevalence of 70.2%, with a mean severity score of 17.2 ± 10.5. This prevalence was 7 times higher than the National Health 2000 survey among adult Finns (Lahti et al, 2008). No statistically significant differences were found between malocclusion groups. Physical pain, followed by psychological discomfort and disability, were the most commonly reported oral impacts. Females more often reported being self-conscious, feeling tense, having difficulties relaxing, and being irritable with other people.

Conclusions: Patients seeking treatment for severe dental malocclusions report profound increases in oral health impacts on quality of life, as measured by the OHIP-14. Females tend to be more affected than males.

Reviewer's Comments: This study is limited by the fact that it is a secondary analysis of data collected for a longitudinal study, but the differences found by the authors were profound enough to be meaningful. Although there was no control group, there are recently published data for comparison. The impact on quality of life for this severe malocclusion group was twice that of a group of denture wearers and equal to that of patients with severe xerostomia. Some sort of quality-of-life impact measure should be part of determining who receives treatment for malocclusion when resources are limited. (Reviewer-Brent E. Larson, DDS, MS).

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Keywords: Quality of Life, Malocclusion

Print Tag: Refer to original journal article
Effect of 1- vs 2-Step Extraction Space Closure on Root Resorption

Root Shortening in Patients Treated With Two-Step and En Masse Space Closure Procedures With Sliding Mechanics.

Huang Y, Wang X-X, et al:

Angle Orthod 2010; 80 (May): 492-497

There is no difference in the amount of root resorption comparing 1-step and 2-step extraction space closure.

**Background:** Although tooth extraction is employed less today during orthodontic treatment, there are cases in which significant crowding and tooth proclination require extraction of first premolars. If a patient has the potential for root resorption, there is often concern about how to close the remaining extraction space. Should all 6 anterior teeth be retracted at once, or should the canines be retracted first, followed by the incisors? Would there be any difference in the amount of root resorption?

**Objective:** To comparatively assess the severity of root shortening in patients treated with 2-step or en masse procedures with sliding mechanics to close extraction spaces.

**Design/Participants:** This prospective trial included a sample of 52 adolescent subjects with an average age of 15 years; the subjects were divided into 2 groups.

**Methods:** The 4 first premolars were extracted in all subjects. In one group, a 2-step procedure was used to close extraction spaces using nickel-titanium springs. With this procedure, the canines were retracted first, and then the 4 incisors were retracted. In the second group, all 6 anterior teeth were retracted at one time. The authors used panoramic radiographs with stainless steel wires attached to the brackets of the maxillary incisors to verify and calibrate any measurement error or radiographic magnification. The amount of root resorption was compared between the 2 groups.

**Results:** Results showed that there were no statistically significant differences between the amount of root resorption occurring with either the 2-step or en masse space closure techniques.

**Conclusions:** 2-step and en masse space closure techniques produce similar effects on root shortening in the maxillary anterior region.

**Reviewer's Comments:** I liked this study and had often wondered about this question. The sample size seemed adequate, and the authors were careful in selecting patients who did not have the potential for root resorption. As a result, minimal root resorption occurred. Some of these patients might not have been susceptible to root resorption. What if the authors would have had a sample of subjects who were susceptible to root resorption? Would there then have been a difference? (Reviewer-Vincent G. Kokich, Sr, DDS, MSD).

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Keywords: Root Resorption, Extraction

Print Tag: Refer to original journal article
When purchasing new technology for your office, it is important to do the research and determine the product's value before making the purchase decision.

**Background:** New technology is being developed for orthodontic practices on almost a daily basis. How do you decide to purchase new technology for your office? To make an informed decision, you need to follow some specific criteria.

**Objective:** This guest lecture article discusses 4 criteria that can be used to help you make an informed decision as to whether you should purchase some new technology for your office.

**Results:** To do this, Dr. Levin suggests that you ask the following questions. How will the technology affect the quality of care? Will the technology increase speed? Will the technology improve practice efficiency? Does the technology provide a return on investment? A positive decision to purchase new technology does not require that all 4 of these criteria be met; however, if <3 of them are met, you should question the appropriateness of purchasing the new technology. Dr. Levin also notes that the decision to purchase new technology in a medical or dental practice can be more complicated than purchasing other new technology because, due to the high cost of research and development for medical and dental technology, the cost does not decrease as rapidly as for other new technologies (eg, computers and cell phones). Although second-generation technology usually has fewer deficiencies than first-generation technology, it can sometimes be costly to keep waiting for new technology to become perfect and less expensive.

**Conclusions:** Before purchasing new technology, it is critical to do the research and determine the product's value to your practice and patients over the long term.

**Reviewer's Comments:** Purchasing new technology for your office can be a complicated decision. One of the things that Dr. Levin did not mention in his article was that, with the exploding increase in the use of new computer technology by teenagers, your office could appear outdated. Based on this, it could be assumed that your treatment is also outdated, even though it is not. Personally, I do not like to purchase any type of new technology (such as a car) until there has been enough time to work all the bugs out. I assume this philosophy can, to some degree, also be applied to purchasing new orthodontic technology. (Reviewer-John S. Casko, DDS, MS, PhD).

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Keywords: New Technology, Informed Decision Making

Print Tag: Refer to original journal article
Orthodontic practitioners in the U.K. indicate a general desire to maintain lower intercanine width during treatment but no uniform method to select an arch wire or arch form to achieve this goal.

**Background:** Many studies have looked at the stability of orthodontic results. In particular, attention has been paid to the form of the arch. Previous studies have found that using an arch form that maintains intercanine width, intermolar width, and arch length contributes to a stable result.

**Objective:** To determine the choices clinicians make when choosing arch wires during initial alignment and space closure.

**Design:** Survey.

**Participants:** 100 orthodontic practitioners within the Bristol Dental Hospital or who were contacted at local meetings were included in the survey. These consisted of consultant orthodontists (n=37), specialist practitioners (n=36), senior specialist registrars in orthodontics (n=10), and dentists with a special interest in orthodontics (n=17).

**Methods:** A questionnaire survey was distributed between November 2005 and March 2006. The questionnaire was divided into 2 parts, wires for initial alignment and wires for space closure in a Class I premolar extraction case. For initial alignment wires, clinicians were asked about arch-wire material, dimensions, trade name, arch form, and the importance of these factors when choosing a wire. For the space closure wires, clinicians were asked about arch-wire material, dimensions, use of study models for adaptation, use of symmetry charts, and the importance of these factors when using a wire.

**Results:** The 100 questionnaires returned represented a 92.6% response rate. A 0.022-inch slot was used by 99% of clinicians. For initial alignment wires, 1 clinician used 0.014 inch multi-stranded stainless steel, while the other 99% used nickel-titanium; of the 99%, 23 used classic NiTi (martensitic stable), 34 used super-elastic (austenitic active), and 34 used heat-activated (martensitic active) NiTi; 9 did not know what type of NiTi they used. At this stage, arch form was found to be important by 16% of clinicians and the arch width by 23%. For space closure wires, 1 clinician used 0.018 x 0.025-inch NiTi, and the other 99% used stainless steel. All but 5 clinicians felt that adaptation to the canines was important, but there was great diversity on the other landmarks (incisors, premolars, or molars). In addition, the use of casts and symmetry charts varied.

**Conclusions:** A majority of clinicians felt that preserving a patient's pretreatment arch form was important in the later stages of treatment, but not for selection of initial alignment wires. No uniformity was found in the method used to preserve arch form.

**Reviewer’s Comments:** Although this was not a scientific study of arch form or the ability to maintain arch form, it was interesting that most clinicians at least claimed to be concerned about preservation the lower arch intercanine width. Most of the clinicians rightly believed that arch form selection was less important for early alignment wires when tooth-to-tooth discrepancies override overall arch form characteristics. It would be interesting to look at actual treatment outcomes from this group of practitioners to see if the varied methods used during later treatment stages were equally successful in maintaining the lower arch form. (Reviewer-Brent E. Larson, DDS, MS).

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Keywords: Arch Form, Arch Wires, Survey

Print Tag: Refer to original journal article
Parents are generally satisfied with the care provided for their cleft lip/palate children, but they would like all members of the health-care team to be better informed about the needs of, and treatment for, this unique group.

**Background:** Multidisciplinary cleft lip and palate (CL/P) centers exist in >200 locations in the United States. Using a multidisciplinary approach and giving the family opportunities to play an active role in the treatment process greatly aids in treatment results and patient satisfaction.

**Objective:** To access parental perspectives of the current care provided by a CL/P team.

**Design:** Qualitative interviews.

**Participants:** 17 parents (15 mothers, 2 fathers) of CL/P patients <1 year old who were evaluated at the Craniofacial Center at Cincinnati Children's Hospital Medical Center were included. A total of 33 families were invited to participate, but 13 could not be reached and 3 declined participation.

**Methods:** A scripted interview guide was created after consulting with a team of experts in the field. Closed-ended demographic questions and open-ended questions about the family's experience were used. The telephone interviews lasted 20 to 60 minutes and were recorded. The author and an independent examiner both reviewed the transcripts to determine common themes.

**Results:** All parents reported being satisfied with their experiences with the craniofacial team. There were common techniques that were found helpful by parents; these included repetition of information, seeing before and after photographs, anticipatory guidance on dealing with people staring, description of surgical procedures, and reassurance about their child's development. However, there were improvements desired by parents that included more written information to take home, more knowledge of CL/P for health-care providers not on the craniofacial team, and greater consistency of information between providers.

**Conclusions:** Parents of CL/P children are satisfied with care provided at multidisciplinary centers, but improvements can still be made. Education of health-care providers outside of the craniofacial team was very important to parents.

**Reviewer's Comments:** While orthodontist typically may not see CL/P patient under the age of 1 year (except those involved in infant orthopedics), I think many of these results are applicable to an orthodontic office: use of before and after photos; good description of procedures (which can involve surgical procedures in these patients); and having written material for the patient/parent. Also important is the consistency of information so the orthodontist is providing the same information about the collaborative treatment as other health-care providers. (Reviewer-Brent E. Larson, DDS, MS).

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**Keywords:** Cleft Lip/Palate, Intervention, Parent Education

**Print Tag:** Refer to original journal article
Two parallel micro-implants (temporary anchorage devices) joined with composite can provide anchorage for moving an impacted canine into position with precise control of force magnitude and direction.

**Background:** Impacted canines are a relatively common occurrence that can be technically difficult for an orthodontist to treat without adverse side effects and prolonged treatment time. A certain level of control is required when applying force to the canine to avoid causing resorption of the lateral incisor root; this is commonly achieved with full fixed appliances.

**Objective:** To describe a method of using joined micro-implants to erupt a labially impacted canine without use of full fixed appliances.

**Design:** Case report and expert opinion.

**Participants:** A 13-year-old female with a labially impacted upper left canine was the subject of this case report. Radiographically, the mesial edge of the canine crown was fully past the lateral root.

**Methods:** The canine was surgically exposed, a lingual button was bonded, and the flap was sutured back over the crown. Two micro-implants were placed 2 mm apart in the anterior palate, tied together with a ligature wire, and a standard 0.018-inch bracket was bonded by covering both implants with composite. A sectional wire was used to place 50g of horizontal distalizing force for 9 weeks. At this point, a more vertical force was used for 4 weeks to erupt the canine through attached mucosa. Then, the force was placed in an occlusolingual direction to position the canine in the arch. A bracket was bonded to the canine when the labial surface was available. Unfortunately, the patient discontinued treatment after 11 months due to financial constraints, but at this point, the canine was in a reasonable position in the arch.

**Conclusions:** Micro-implants can be used to provide force to erupt impacted canines. By joining 2 adjacent micro-implants, a wide range of forces and moments can be applied to guide canine eruption with minimal risk of implant failure. Using a method similar to this could minimize time needed in fixed appliances for patients with impacted canines.

**Reviewer’s Comments:** The same tactic could be used with a single implant that has a slot in the head, but the long moment arm than results can apply significant torsional force to the implant. The authors mention that in adolescents, the patients frequently in need of such treatment, torsional force and early loading, have been linked to a higher rate of implant failure. Overall, I like this as an optional technique for canine movement where space is adequate and the need for fixed appliances in other areas is minimal. (Reviewer-Brent E. Larson, DDS, MS).

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Keywords: Micro-Implant, Impacted Canines, Forced Eruption

Print Tag: Refer to original journal article
Canine Transmigration Is Rare Occurrence


Vuchkova J, Farah C:


Although canine transmigration is a rare event, this paper reports 4 new cases discovered in the last 6 years and a literature review reveals it occurs more often in females.

**Background:** Canine transmigration is a rare dental finding where a horizontally impacted mandibular canine undergoes intraosseous migration to the contralateral side of the mandible. Some inconsistency is found in defining these cases. The authors advocate using the term canine transmigration for when the canine is at least half its length across the midline. (This was originally proposed by Javid, 1985, yet many people define the term as only the cusp tip crossing the midline.)

**Objective:** To comprehensively review the literature on canine transmigration and offer new case reports.

**Design:** Case reports and literature review.

**Methods:** A radiographic survey of 60,000 orthopantomograms taken between 2004 and 2009 in Queensland, Australia was examined for canine transmigration.

**Results:** 4 cases were found where a canine transmigration existed, which were the first documented occurrences in the Australian population. All patients were women, and 3 of the 4 cases involved the left mandibular canine. Two cases showed unique findings: one had a vertically positioned transmigrated canine (first time reported), and one was underlying the contralateral impacted canine (second time reported). A comprehensive review of the literature showed only 86 of the 185 published cases of canine transmigration met the definition of being halfway across the midline. These cases predominantly affected the left canine (1.6:1) and females (1.8:1). All cases were in the mandible.

**Conclusions:** Canine transmigration is a rare occurrence where a mandibular canine migrates over half its length past the mandibular midline.

**Reviewer's Comments:** An interesting note was the transmigration in 2 instances included in the literature review was verified by demonstrating the nerve connection was still to the contralateral site. Another interesting fact is that although impacted canines are 20 times more common in the upper arch, transmigration has never been reported in the maxilla, presumably because of the mid-palatal suture and dense cortical bone.

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

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Keywords: Canine Impaction, Transmigration

Print Tag: Refer to original journal article
Autotransplantation Can Be Successful Procedure in Experienced Hands

Autotransplantation of Teeth in 215 Patients: A Follow-Up Study.
Kvint S, Lindsten R, et al:

Angle Orthod 2010; 80 (May): 446-451

In the hands of the correct surgeon, the success rate of autotransplantation of consecutive teeth is approximately 80% after almost 5 years.

**Background:** Trauma to the maxilla could cause avulsion of an anterior tooth. When this occurs, especially in a young individual, it creates a difficult problem long term for the patient. One option for replacing a missing tooth is autotransplantation of another tooth to that site. Although this solution is not common in the United States, it is relatively common in Europe.

**Objective:** To evaluate the success rate of autotransplantation of teeth in a consecutive patient sample to analyze factors implicated in the outcome.

**Design/Participants:** Retrospective evaluation of 215 patients who had undergone autotransplantation.

**Methods:** The patients were treated consecutively and were recalled an average of 4.8 years after autotransplantation to determine the success. Factors that were regarded as unsuccessful were those teeth that had ankylosed, required root canal therapy, or were undergoing root resorption.

**Results:** The results of this study showed that the average success rate of the sample was 81% after 4.8 years. Factors that caused a negative impact on the prognosis were difficult extractions, deviated root anatomy, or damage to the periodontium of the donor tooth during the autotransplant procedure. When the author evaluated the 24 maxillary and mandibular premolars that had been autotransplanted to the maxillary incisor region, the success rate was 100%.

**Conclusions:** Autotransplantation is a relatively highly successful procedure, especially for premolars that are transplanted to the maxillary incisor region.

**Reviewer's Comments:** I was impressed by the work performed in this study. To recall 215 patients who had autotransplantation is a large task. I was also impressed with the authors' honesty and comments regarding the surgical procedure. The success rate was very high, especially for premolars being transplanted to maxillary incisor regions. Unfortunately, surgeons in the United States are not experienced at performing this procedure. In the hands of the correct surgeon, this procedure can be very predictable. (Reviewer-Vincent G. Kokich, Sr, DDS, MSD).

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Keywords: Autotransplantation, Trauma

Print Tag: Refer to original journal article
Third Molar Caries Relatively High in Middle-Age, Older Americans

Third Molar Caries Experience in Middle-Aged and Older Americans: A Prevalence Study.


Third molar caries are detected in 77% of subjects between 50 and 70 years of age.

**Background:** A common decision for orthodontists is whether or not to recommend extraction of third molars after orthodontic treatment. If space is not an issue, most orthodontists would recommend maintaining the third molars and allowing them to erupt. Once erupted, do these third molars present problems for an individual through their lifetime? Is there a higher incidence of caries in third molars compared to other teeth?

**Objective:** To determine the prevalence of third molar coronal caries in a middle-aged and older population of individuals and to relate these findings to caries experience for anterior teeth in the mouth.

**Participants/Methods:** This was an evaluation of subjects who had been included in the Dental Atherosclerosis Risk in Communities Study. Over 6,500 participants had been involved in this study. Oral examinations had been completed on these individuals, and coronal caries, both decayed and filled surfaces, had been calculated. The authors then made a determination of the prevalence of third molar caries and related the incidence of carious third molars to the incidence of caries in anterior teeth.

**Results:** Of those patients with visible third molars, caries experience was detected in at least 1 third molar coronal surface in each of the 1,550 subjects, giving a prevalence of 77%. In teeth more anterior to third molars, the caries experience was detected at 98%. When these 2 findings were compared, the authors found that coronal third molar caries experience was significantly associated with caries experience in more anterior teeth for 76% of the population.

**Conclusions:** Third molar caries experience is relatively high in middle-aged and older Americans, and this higher caries experience in third molars is related to caries experience in the anterior teeth as well.

**Reviewer’s Comments:** How can orthodontists utilize this information? At the end of orthodontic treatment, if there is space for third molars to erupt and that individual has a high caries experience in the anterior teeth, this study has shown that the third molars eventually will also probably have caries. Then, these teeth will need to be restored. Would it perhaps be better to extract these teeth early on in those subjects who have a high caries incidence in the anterior teeth to avoid problems with caries and restoration of third molars in the future? Each clinician must make that decision based upon careful analysis of the existing research data. (Reviewer-Vincent G. Kokich, Sr, DDS, MSD).

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Keywords: Third Molar Caries, Older Patients

Print Tag: Refer to original journal article
Patients taking oral bisphosphonates have a low risk of developing osteonecrosis of the jaw.

**Background:** In recent years, researchers have reported osteonecrosis of the jaw in patients who have been taking bisphosphonates. The greatest concern is for those individuals taking IV bisphosphonates. The most common method of receiving bisphosphonates is orally, and many patients with osteoporosis have been prescribed oral bisphosphonates. Orthodontists often treat patients who are taking oral bisphosphonates.  

**Objective:** To focus on the prevalence of osteonecrosis in a large cross-sectional survey of medical patients.  

**Participants/Methods:** This was a retrospective evaluation of subjects who had been taking oral bisphosphonates at a large health-care delivery system. Over 13,000 questionnaires were mailed to individuals who had been taking oral bisphosphonates, and >62% of those individuals responded and returned their questionnaires. After performing telephone interviews to clarify the patients’ symptoms, clinical examinations were conducted on those who were deemed symptomatic of osteonecrosis. In addition, other subjects had their dental records studied.  

**Results:** After a thorough evaluation of the respondents’ survey data as well as examinations and viewing of dental records, the authors identified 9 cases of osteonecrosis of the jaw, which resulted in a prevalence of 0.10%. Of these 9 patients, 5 had developed osteonecrosis spontaneously without a known dental procedure preceding the onset. Of these 5 patients, 3 had exposed bone on palatal tori, and 2 developed spontaneous exposure of bone in lingual mandibular areas. Four patients developed osteonecrosis after tooth extraction. After reviewing their data, the authors predicted a frequency of osteonecrosis among oral bisphosphonate patients to be 28 per 100,000 persons.  

**Conclusions:** There is low risk of developing osteonecrosis of the jaw in individuals who have been taking oral bisphosphonates.  

**Reviewer’s Comments:** I was pleased to see this large study. Osteonecrosis related to bisphosphonate therapy has received a lot of attention in the literature in the last 2 to 3 years. However, most of the problems occur in patients taking IV bisphosphonates. I was pleased to learn that the incidence of osteonecrosis in those taking oral bisphosphonates was very low. This is good news for orthodontists who treat patients, especially adult females, who could be taking oral bisphosphonates. (Reviewer-Vincent G. Kokich, Sr, DDS, MSD).

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Keywords: Bisphosphonates, Osteonecrosis of the Jaw, Prevalence

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Patients With ≥80% Overbite Have Extended Duration of Tx

Pretreatment Characteristics Associated With Orthodontic Treatment Duration.
Fisher MA, Wenger RM, Hans MG:

Am J Orthod Dentofacial Orthop 2010; 137 (February): 178-186

Poor school grades can be related to an extended period of treatment time in patients undergoing extended orthodontic treatment.

Background: For most orthodontists, the expected duration of treatment is a factor in determining the cost of comprehensive orthodontic treatment. What factors do you look at to predict the expected length of orthodontic treatment? Knowing the answer to this question would be helpful for all orthodontists.

Objective: To determine what pretreatment characteristics can help to predict the duration of comprehensive orthodontic treatment.

Participants: The sample for this study consisted of 400 patients who underwent comprehensive orthodontic treatment.

Methods: A number of pretreatment characteristics were identified and then correlated with the patients who had long-treatment duration, which was defined as ≥30 months.

Results: The patients who were planned nonextraction, had no deciduous teeth, <80% overbite, <6 mm of maxillary crowding, and good oral hygiene were 2 to 3 times more likely to have short treatment duration. Patients with decreased lower facial height, extractions, deciduous teeth present, poor grades, excessive overjet, ≥80% overbite, ≥6 mm of maxillary crowding were 2 to 3 times more likely to have long treatment duration.

Conclusions: Pretreatment characteristics can be used to predict the duration of orthodontic treatment.

Reviewer's Comments: This was a very good article. It would be interesting to select a small sample of your patients who have some of the positive and negative characteristics listed in this study and see if these results applied to your practice. It was interesting that poor grades were related to an extended duration of treatment. I do not think many orthodontists collect information about a patient's grades; however, if you could tactfully do this, you would have 1 more characteristic to look at to help you predict the duration of treatment and set your fee appropriately. (Reviewer- John S. Casko, DDS, MS, PhD).

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Keywords: Orthodontic Treatment, Duration, Pretreatment

Print Tag: Refer to original journal article
If you need rapid maxillary expansion in a patient with a number of missing teeth, a BAME can be effective.

Background: If you have a patient who needs rapid maxillary expansion (RME) but has a number of missing teeth, it may not be possible to place a traditional RME appliance. For a patient like this, would it be possible to achieve RME with a bone-borne appliance, and if this were possible, would the results be similar?

Objective: To compare the transverse, vertical, and anteroposterior skeletal and dental changes in adolescents receiving RME treatment with tooth-borne and bone-anchored maxillary expanders.

Participants: The sample for this study consisted of 62 patients who needed maxillary expansion.

Methods: The 62 patients were randomly allocated to 1 of 3 groups. One group received a traditional tooth-anchored rapid maxillary expander (TAME) with bands on the first permanent molars and the first premolars. The second group received a bone-anchored maxillary expander (BAME) composed of 2 custom-milled stainless steel onplants, 2 miniscrews, and an expansion screw. The third group was a control group that received no treatment for 12 months. Cone-beam computed tomography (CBCT) images were taken at baseline, immediately after expansion, after activation of the appliance, after removal of the appliance, and before fixed bonding to evaluate dental and skeletal changes. The differences between the 3 groups were then statistically evaluated.

Results: When the changes for the TAME and BAME groups were compared, both groups showed similar results. Dental crown expansion was greater than apical and skeletal expansion with both appliances. TAME resulted in significantly more long-term expansion at the maxillary premolar crown and root.

Conclusions: Traditional TAMES and BAMEs achieved similar results.

Reviewer's Comments: I must admit that I was surprised by the results of this study. I would have expected to see greater skeletal expansion with the BAME, and I am not sure why there was no difference. The bad news is that you cannot expect to get greater skeletal expansion with a BAME appliance; however, the good news is that if you have a patient with multiple missing teeth who needs maxillary expansion, you can effectively achieve this expansion with a BAME appliance. (Reviewer-John S. Casko, DDS, MS, PhD).

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Keywords: Rapid Maxillary Expansion, Bone Anchored, Traditional

Print Tag: Refer to original journal article
Orthodontic patients with triangular-shaped roots are more likely to incur severe root resorption.

**Background:** It is not uncommon for patients undergoing orthodontic treatment to incur root resorption. **Objective:** To determine the prevalence of severe root resorption in Brazilian patients treated with the edgewise method and to identify possible conditions related to the resorption. **Participants:** The sample for this retrospective study consisted of 1049 patients who underwent orthodontic treatment with the edgewise appliance. **Methods:** Periapical radiographs were taken of all of the incisors prior to and at the completion of orthodontic treatment. The amount of root resorption and factors related to it were statistically analyzed. **Results:** 14.5% of the sample experienced severe root resorption, which was defined as resorption exceeding one-third of the original root length. Patients were identified as having undergone severe root resorption when at least 1 of their incisors had severe root resorption. The main factors directly related to severe root resorption were extraction of first premolars, triangle-shaped roots, and the presence of root resorption prior to treatment. **Conclusions:** Orthodontic patients treated with the edgewise appliance who had first premolar extractions were more likely to experience severe root resorption than nonextraction patients. **Reviewer's Comments:** I was surprised by the relatively high percentage (14.5%) of the patients who had severe root resorption. Because it only took 1 incisor with severe root resorption to classify the patient as having severe root resorption, the percentage of incisors that underwent severe root resorption was undoubtedly much less. I suspect that the reason for the higher occurrence of severe root resorption in patients who underwent 4 first premolar extractions was likely due to greater retraction of the maxillary incisors and contact of the apices of the maxillary incisors with the palatal cortical bone. (Reviewer-John S. Casko, DDS, MS, PhD).

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Keywords: Root Resorption, Edgewise Method, Prevalence, Predictive Factors

Print Tag: Refer to original journal article