

What's new in dentistry

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As orthodontists, we are often unaware of the technical and methodological advances in other dental specialties. However, many of these new experimental developments may ultimately become accepted dental therapy and influence the diagnosis and treatment of our orthodontic patients. Therefore, as part of the dental community, we must keep abreast of current information in all areas of dentistry. The purpose of this section of The Angle Orthodontist is to provide a brief summary of what's new in dentistry.

LOW INCIDENCE OF NERVE DAMAGE WITH MANDIBULAR DISTRACTION OSTEOGENESIS. Distraction osteogenesis has become a popular topic at orthodontic meetings. In some countries outside the U.S., distraction osteogenesis has become an acceptable method for correcting severe mandibular retrognathia in young individuals. This trend is gradually becoming accepted in the U.S. for the most severe maxillomandibular anomalies. However, what is the possibility of damaging the inferior alveolar nerve as the mandibular segments are distracted away from one another? This question was answered in a study that was published in the *Journal of Oral and Maxillofacial Surgery* (1998;56:1417-1423). The sample consisted of 14 beagle dogs. Two were used as controls, and distraction osteogenesis was performed on the mandibles of the other 12. The sites were separated at a rate of 1 mm per day. The conduction potential of the inferior alveolar nerve was measured before and after distraction and up to 8 weeks after stabilization. The results showed that if the nerve was not damaged during the surgical procedure, the conduction potential of the inferior alveolar nerve was not greatly disturbed. In conclusion, if the surgeon is careful not to damage the nerve during the initial surgery, the risk for nerve damage following distraction osteogenesis of the mandible is low.

PREOPERATIVE MOUTH OPENING DETERMINES SUCCESS AFTER TMJ ARTHROSCOPIC SURGERY. In some individuals with adhesions of the temporomandibular meniscus and limited mouth opening, arthroscopic surgery may ameliorate symptoms. During the procedure, the surgeon usually performs lysis and lavage of the joint to release the adhesions and completely irrigates the area to remove surgical debris. But is arthroscopic surgery successful in all situations? Are

there certain indicators prior to surgery that will predict the success rate of surgery? These issues were discussed in a study published in the *Journal of Oral and Maxillofacial Surgery* (1998;56:1394-1397). The sample consisted of 14 patients with a total of 16 anteriorly displaced discs without reduction. All subjects had limited mouth opening. Arthroscopic lysis and lavage was performed, and the subjects were reevaluated to determine if the amount of mouth opening had increased, and to correlate preoperative mouth opening with the success of the surgery. The results were considered unsuccessful in 2 of the 14 patients; these 2 had less than 20 mm of mouth opening initially. The authors believe that patients who have greater than 22 mm of preoperative mouth opening have a greater chance of benefiting from arthroscopic lysis and lavage.

IMPROVED METHODS FOR RESOLVING CLASS II FURCATION DEFECTS. In the past, furcation defects in maxillary or mandibular molars were difficult to treat. Generally, resective bone surgery, root amputation, or hemisection were used to prevent plaque from accumulating in the furcation defect. However, these procedures are destructive. Today, regenerative procedures are generally used to correct Class II furcations prior to orthodontic therapy, and the choice of materials used to regenerate attachment has increased. Resorbable membranes and bone grafting are the methods commonly employed. But are both these techniques necessary? Will membranes alone produce the same result, or must a bone graft be added to achieve the optimal effect? These questions were answered in a study published in the *Journal of Periodontology* (1999;70:8-12). The authors used a sample of 12 subjects with bilateral molar Class II furcation defects. Guided tissue regeneration was performed using a bioabsorbable membrane alone on one side and

a bone graft in addition to placement of the membrane on the other. The defects were evaluated 6 to 12 months after surgery. The results showed that use of the membrane alone resulted in a significant decrease in vertical probing depth. The addition of the bone graft resulted in a significant reduction in horizontal probing depth. In conclusion, guided tissue regeneration with a bioabsorbable membrane alone or in combination with a bone graft resulted in correction of the Class II furcation defect. The bone graft did lead to greater reduction in the horizontal probing depth.

EFFICIENCY OF MULTISTRANDED STEEL AND SUPERELASTIC NICKEL TITANIUM ARCHWIRES FOR ALIGNMENT EQUIVOCAL. Nickel titanium archwires have become extremely popular during initial alignment after placement of orthodontic bands and brackets. These superelastic archwires have replaced the multistranded steel archwires that were developed during the late 1970s. Most clinicians believe that nickel titanium archwires are much more efficient at aligning teeth, especially during the early part of orthodontic treatment. But is that assumption true? And are nickel titanium archwires really more efficient than multistranded steel wires at initial alignment? That question was addressed in a study published in *Clinical Orthodontic Research* (1998;1:12-19). Researchers used a sample of 155 dental arches in 123 subjects. The sample was divided into various groups, using one of three types of archwire, and brackets with either .018" or .022" slots. Subjects had an irregularity index of at least 5 mm at the outset of the study. The archwires were ligated monthly until a 2 mm irregularity index was reached. The treatment time was determined and compared between groups. There were no significant differences between

any of the archwires in terms of efficiency of aligning teeth. The bracket with the .022" slot was more efficient than the .018" at aligning teeth. In conclusion, there are no differences in efficiency in the rate of alignment of crowded teeth when comparing braided steel, nickel titanium, or ion-implanted nickel titanium archwires.

AGE AND "BAD SPLITS" RESPONSIBLE FOR NEUROSENSORY DEFICIT AFTER SAGITTAL OSTEOTOMY. Neurosensory deficit after sagittal osteotomy is a common occurrence. Normal nerve sensation generally reappears 1 or 2 years after jaw surgery, but in a small group of individuals, normal sensation is never reestablished. How often does permanent nerve damage occur? Are there any predictors for permanent nerve damage prior to surgery? These issues were discussed in an article published in the *Journal of Oral and Maxillofacial Surgery* (1998;56:1231-1235). The sample consisted of 85 patients who had undergone sagittal split ramus osteotomy at least 2 years prior to evaluation. The sample was divided into groups based on age, and the subjects were asked to complete a questionnaire to determine if they had a neurosensory deficit, and if it posed a functional problem. In addition, the authors attempted to determine if age and/or problems during surgery were correlated with neurosensory and functional deficits. They found that neurosensory deficits were very high after 2 years. Functional deficits were relatively low in younger patients, and higher in older ones. Patients over 40 had a 47% incidence of functional problems. A "bad split" was the factor most commonly associated with functional impairment. In conclusion, increasing age and "bad splits" during sagittal ramus osteotomy had the highest incidences of functional impairment due to neurosensory deficit.