

What's new in dentistry

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.

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COSTOCHONDRAL GRAFTS SUCCESSFUL AT REPLACING CONDYLES—Orthodontists occasionally treat patients with hemifacial microsomia. This developmental disorder involves lack of formation of the condyle and fossa. As a result, the patient develops asymmetrically during growth and requires significant surgery and complicated orthodontic treatment to correct the malocclusion. In the past, surgeons have attempted to graft the condyle at a young age to increase growth of the mandible on the affected side and avoid the asymmetry. A study published in the *Journal of Oral and Maxillofacial Surgery* (1996;54:1393-1400) documents the success of this type of surgery in a group of consecutively treated patients. The sample consisted of 11 patients who had costochondral grafts placed to correct hemifacial microsomia or condylitis. Computed tomography and clinical examination were used to measure condylar function 5 years after the surgical procedure. Although some of the patients had dysfunctional symptoms, none had condylar ankylosis. Some of the grafts had to be replaced, but the re-operations were successful. In general, the authors believe that the majority of the patients benefited from replacement of the deformed condyle, which at least permitted the ramus to grow more normally and produced less asymmetry on the affected side. Although costochondral grafts are not a panacea, they should at least be considered for the young patient with hemifacial microsomia or severe condylitis.

ARTHROCENTESIS IS EFFECTIVE TO CORRECT CLOSED-LOCK OF TMJ—Sudden-onset closed-lock of the temporomandibular joint is a frightening experience for a patient. It may significantly restrict mouth opening. In many instances conservative treatment is ineffective in rehabilitating the patient and improving mouth opening. However, a study published in the *Journal of Oral and Maxillofacial Surgery* (1997;55:151-157), suggests that arthrocentesis is the best method for correcting the problem, and that the etiology is not disc displacement. In the past it has been generally accepted that anterior disc displacement could cause closed-lock of the mandible. However, the authors of this study challenge this hypothesis. Their sample consisted of 40 temporomandibular joints with sudden-onset closed-lock. All patients were treated surgically with arthroscopic lysis and lavage of the affected condyle to disrupt adhesions between the condyle and the disc. The results of this study show complete success of the entire sample for up to 12 months after the arthrocentesis procedure. The authors believe that disc displacement is not the cause of sudden-onset closed-lock of the TMJ. If it were, they do not believe their procedure would have been so successful. They propose that sudden locking of the TMJ is more likely due to an adhesion that develops between the condyle-disc-fossa that limits the translation of the condyle and therefore restricts mouth opening.

DISC DISPLACEMENT COMMON IN ASYMPTOMATIC SUBJECTS—Clicking of the temporomandibular joint is often taken as a sign that an individual has an anteriorly displaced disc on the side of the clicking. But is this assumption valid? Do all clicking joints have a displaced disc? Could nonclicking joints also have disc displacement? These questions were addressed in a study published in the *Journal of Oral and Maxillofacial Surgery* (1996;54:147-153). The sample consisted of 100 consecutively examined patients with symptoms of TMD, including clicking of the temporomandibular joint. Each patient had an MRI and a clinical exam to verify whether or not the disc had been anteriorly displaced. These subjects were compared to a sample of 76 subjects with no temporomandibular symptoms. These individuals also had an MRI to determine the position of the disc relative to the condyle. The results were surprising. In the symptomatic sample, only 75% had disc displacement that could be verified on the MRI. In the group that was totally asymptomatic, 33% had disc displacement. Based upon this study, it appears that simple clicking of the temporomandibular joint may not be a reliable indicator of disc displacement.

TONGUE VOLUME NORMAL IN PROGNATHIC PATIENTS—Some patients with significant mandibular prognathism seem to have large tongues that protrude laterally and anteriorly. Does the presence of larger tongue volume actually predispose or cause the development of a prognathic mandible? This question was answered in a study that was published in the *Journal of Dental Research* (1996;75:1957-1962). The sample consisted of 16 adult orthodontic patients with mandibular prognathism. They were compared with a sample of 10 adult volunteers with normal profiles. Magnetic resonance imaging was used to measure the volume of the tongue in both groups of individuals. The authors compared tongue size between groups and correlated tongue size with various cephalometric landmarks. The results were interesting. First of all,

tongue volume did not relate to mandibular prognathism. Individuals with larger tongues do not have more prognathic mandibles. However, the larger the tongue, the more backward and downward the mandible was positioned. The authors presumed that this represented a need for maintenance of the pharyngeal airway. Of course this is hypothetical, but it is a possible correlation that would need to be tested. In conclusion, patients with mandibular prognathism do not have larger tongues than patients with more mesognathic facial profiles.

OCCUSAL BITE FORCE IMPROVES AFTER MANDIBULAR SET-BACK—Today, after orthognathic surgery, the bony fragments are usually fixed rigidly with titanium screws or miniplates. Patients generally favor this approach because it allows them to function more quickly after the surgical procedure. But does the use of rigid or wire intermaxillary fixation have any effect on the patient's chewing efficiency after the jaw surgery? This issue was discussed in a paper published in the *Journal of Oral and Maxillofacial Surgery* (1997;55:121-126). The sample consisted of 26 patients with mandibular prognathism. All individuals were treated orthodontically and with mandibular surgery to reduce the prognathism. In part of the sample, rigid fixation was used to stabilize the fragments. In the other portion of the sample intermaxillary wire fixation was used from 1 to 7 weeks. Occlusal bite-force measurements were made on all patients before surgery and then at 3, 6, and 12 months after surgery. Based on their analysis, these researchers showed that the length of intermaxillary fixation does affect the bite-force after surgery. Although bite-force generally increased in all groups, the recovery period took much longer in those individuals who were placed in intermaxillary fixation for 6 to 7 weeks. However, after 1 year there were no significant differences in bite-force between the two groups. Therefore the bite-force improved significantly in both of the surgical groups, but it improved more rapidly in the group with rigid fixation.