

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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WHIPLASH INJURIES DON'T DAMAGE

TMJ—When an individual is involved in a rear-end collision in an automobile, his or her head and neck usually extends backward and then flexes forward. This movement is called whiplash. Depending upon the velocity of impact, this may result in soreness of the muscles of the neck. Another potential sequela from this type of accident is damage to the temporomandibular joint. Some people believe that a whiplash injury will damage the ligaments of the TMJ, causing dysfunction of the joint. A study published in the *Journal of Oral and Maxillofacial Surgery* (1995;53:256-262) evaluated the effect of a low velocity extension-flexion maneuver on the temporomandibular joint. The sample consisted of four people who were involved in a simulated rear-end collision in a car traveling 5 mph. Each subject had electronic testing devices which recorded the impact of the accident on the head, neck, and mandible. The researchers used mathematical formulas to determine the forward and backward movements of the craniofacial complex and to extrapolate the effect on the TMJ. These researchers found that a low velocity whiplash did not damage the ligaments of the TMJ. In fact, the forces on the TMJ were within the physiologic envelope of forces that are routinely experienced by the joint. These researchers are continuing further studies to determine if higher vehicle speeds would produce a greater magnitude of force on

the TMJ. In conclusion, the low velocity, rear-end collision does not cause injury to the temporomandibular joint.

SINGLE TOOTH IMPLANTS LOOK PROMISING

—Implants are now used routinely in dentistry as abutments for fixed bridges and as single tooth replacements for missing teeth. Orthodontists treat many patients who are congenitally missing maxillary lateral incisors or mandibular second premolars. Are implants suitable for replacing missing teeth in orthodontic patients? How long will they last? A longitudinal study of single tooth implants published in the *Journal of Prosthetic Dentistry* (1995;73:274-279) provides a preliminary report on success of single tooth implants. The sample consisted of 76 implants placed from October 1987 to October 1993 in one clinic. The average age of the sample was 32 years. The implants were uncovered 3 to 6 months after insertion. The success rate was 96% after 5 years. Two implants failed, but these failures occurred before the second stage uncovering. Follow-up radiographs showed that the bone usually remodels down to the first thread on the implant after about 1 year. Minimal bone loss occurred after that. The average sulcular depth around the implants was 2.5 mm. In conclusion, this preliminary report shows that, in terms of periodontal support and surrounding bone level, single tooth implants have a high success rate.

METHOD OF FIXATION A KEY TO STABILITY—After a LeFort osteotomy of the maxilla, the fragments are usually secured by rigid internal fixation using titanium miniplates. Occasionally, patients reject the use of miniplates to avoid having extra metal in the maxilla after the osteotomy sites have healed. In these situations, wire fixation of the fragments is the alternative. Is there any difference in the stability between wire and rigid fixation? This question was answered in a study published in the *Journal of Oral and Maxillofacial Surgery* (1995;53:243-248). Researchers evaluated two groups of patients. In both groups, a LeFort I maxillary osteotomy was performed, and the maxilla was advanced anteriorly to correct a crossbite. In half of the sample, wire fixation was used while in the other half, rigid fixation with miniplates secured the maxilla. Stability was evaluated with cephalometric radiographs taken up to 1 year after surgery. With wire fixation, only half of the patients had relapse of less than 1 mm after surgery. In the group with rigid internal fixation, about 85% showed less than 1 mm of relapse. Three patients in the group with wire fixation had relapse greater than 2 mm, while none of the patients with rigid fixation had greater than 2 mm of change. In conclusion, rigid internal fixation for isolated maxillary advancement is more stable than wire fixation.

PERIIMPLANTITIS AND PERIODONTITIS ARE SIMILAR—Although titanium implants are highly successful, some implants in some patients will fail. Researchers believe that implant failures are often related to destruction of bone around the implant because of plaque accumulation and the presence of certain periodontopathic bacteria that are also associated with bone loss around teeth. A study reported in the *Journal of Periodontology* (1995;66:69-74),

evaluated a sample of 13 partially edentulous patients with 19 failing implants to test this hypothesis. Bacterial flora around the failing implants were harvested, cultured, and identified. These bacterial flora were compared to the bacteria found around teeth that were undergoing periodontal destruction. These bacteria were then subjected to various antibiotics in vitro. Based upon the results of this study, these researchers found that the bacteria around failing implants were similar to the periodontal pathogens found in patients with periodontal disease. In conclusion, the researchers in this study believe that periimplantitis and periodontitis are similar and caused by the same periodontopathic bacteria.

NO CORRELATION OF JAW SURGERY AND CHANGES IN TMD—Occasionally, patients with temporomandibular symptoms such as clicking, popping, limited opening, and pain will undergo orthodontic treatment and orthognathic surgery to correct a malocclusion. Some clinicians believe that normalizing the occlusion and skeletal relationship will result in improved function of the TMJ and reduction of TMD symptoms. This hypothesis was addressed in a study published in the *Journal of Oral and Maxillofacial Surgery* (1995;53:117-121). In this study, researchers evaluated a sample of 30 patients with temporomandibular disorders before and 6 months after orthognathic surgery on the mandible to correct the malocclusion. Results of this study show no correlation between the type of orthognathic surgery and changes in TMD symptoms. In some patients the symptoms improved, and in others they worsened. In conclusion, surgical correction of a Class II or Class III malocclusion has no predictable correlation with changes in temporomandibular joint symptoms.