

## What's New in Dentistry

Vincent Kokich, DDS, MSD

**Can high-resolution ultrasound replace magnetic resonance imaging for diagnosing TMJ disc displacement?** The gold standard for confirming temporomandibular joint derangement or anterior disc displacement is magnetic resonance imaging. This technique clearly identifies and locates the position of the disc relative to the condyle in open and closed positions. However, MRI is expensive and is not readily available in some regions of the world. High-resolution sonography or ultrasound has been gaining popularity as a noninvasive and relatively less expensive method of diagnosing certain soft tissue relationships within the body. Could high-resolution ultrasound replace MRI in the diagnosis of TMJ disc displacement? A study published in the *Journal of Oral and Maxillofacial Surgery* (2010;68:1075–1080), compared these two means of assessing temporomandibular joint derangement. The sample consisted of 28 young adult TMJ patients, who had presented for treatment at a TMJ clinic. Magnetic resonance imaging was performed on all subjects and it was determined that 32 joints were positive for disc displacement and the remaining 24 were negative. Then, each of the joints was subjected to high-resolution ultrasound evaluation to determine the distances between the capsule and condyle in both closed and open-mouth positions. These were then compared to the confirmed diagnosis of disc displacement to determine if the ultrasound measuring technique could accurately predict which joints had disc displacement. The authors determined that the accuracy was in the range of 62 to 71%. Therefore, the authors conclude that ultrasound measurement of the distance between the most anterior point of the articular capsule and the most anterior point of the condyle can be used to assess disc displacement in diseased joints, but is not yet able to replace the accuracy of magnetic resonance imaging.

**Short implants demonstrate high success rates.** Implants provide an excellent means of supporting prostheses in edentulous patients. However, some individuals who have been edentulous for many years have atrophic maxillae or mandibles, and the standard length implants are simply too long to fit in the bone. Can shorter implants be used to successfully to support fixed prostheses in individuals with diminished

maxillary and mandibular alveolar bone? A study published in the *Journal of Periodontology* (2010;81:819–826), evaluated a large sample of subjects who had had short implants placed to determine the rate of success of the implant-prostheses. The sample for this study consisted of over 600 patients who had a total of over 1200 short implants installed in either the maxilla or mandible. The lengths of the short implants ranged from 6.5 mm to 8.5 mm. After placement using conventional surgical techniques, the implants were restored with fixed prostheses. These patients were then evaluated up to eight years later, with an average follow-up time of around four years. The authors found that the success rate of the short implants was over 98% during this time interval. In fact, only 9 of 1200 implants failed. The authors conclude that implant restoration of subjects with limited vertical alveolar height can be accomplished with shorter than normal implants with a relatively high degree of success.

**Botox injections produce localized alterations in bone and muscle.** Botulinum toxin has gained wide popularity as a temporary means of limiting muscle activity in order to enhance facial esthetics. Currently, Botox injections of the upper lip are used to limit the effect of the elevator muscles of the lip in order to reduce gummy smiles in subjects with hyperfunctional upper lip musculature. Another common use of Botox is to shrink the size of the masseter muscle in subjects with benign masseteric hypertrophy. Several studies of this technique have shown successful reduction of the “bulging” masseter muscles in these types of “square-faced” subjects. But are there any side effects of Botulinum toxin that could be detrimental to the bone in the area of the injections, due to the disuse of the injected muscles. A study published in the *Journal of Oral and Maxillofacial Surgery* (2010;68:1081–1087), evaluated the effects of reduced masticatory muscle activity after Botox injections on the jawbones of experimental animals. The authors injected Botulinum toxin into the left masseter muscle of 10 adult male rats, in order to reduce masticatory muscle function. The right masseter muscle was also injected, but received only a saline solution. After three months, the authors evaluated the effects of the Botox on the muscle and bone in the injected area. The authors

found that there were significant differences in all measurements between the control and Botox injected sides. First of all, as expected, there was a statistically significant difference in the weight of the right and left masseter muscles, with the injected muscle weighing less than the control. In addition, the injected side also showed affects on the mandible, with decreased ramus height, increased gonial angle, and increased crown height of the posterior teeth. Finally the authors also found a reduction in bone mineral content and cortical and trabecular thickness on the paralyzed side. The authors conclude that the paralyzing effect of the Botox not only produces changes in muscle mass, but also causes alterations in the underlying bone in the region of the injections.

**Gingival recession not associated with thickness of gingiva or bone.** Gingival biotype is a common term used to describe the thickness of the labial gingiva, especially in the maxillary and mandibular anterior regions. Two types of biotype have been described: a thick-flat tissue biotype, and a thin-scalloped biotype. It has been hypothesized that a person with a thinner biotype could also have thinner labial bone and more commonly display bone dehiscences and concomitant gingival recession. Does the thickness of the gingiva have any relationship to the thickness of the underlying bone or the incidence of gingival recession? A study that was published in the *Journal of Periodontology* (2010;81:569–574) studied the dimensions of the gingiva and underlying alveolar bone in the maxillary anterior region in order to evaluate if an association exists between these two parameters. In order to accomplish this assessment, the authors evaluated 22 fresh cadaver heads. The maxillary anterior teeth were extracted atraumatically. The thickness of both soft tissue and bone were measured using a caliper to the nearest 0.1 mm. Probing depths and gingival recession were also measured at two points on the labial and palatal. Based upon their evaluation, the authors found that

there was a very low association between the thickness of the labial gingival thickness and the underlying bone thickness. In addition, the authors found that gingival recession was not associated with the thickness of both labial gingiva and bone.

**Open vs closed treatment of unilateral condylar fractures.** Fractures of the condylar head are rather common traumatic injuries, and account for between 20% and 60% of all mandibular fractures. However, the choice for the method of surgical treatment of condylar fractures has always been somewhat controversial. Research can be cited which makes either closed or open treatment of condylar fractures seem reasonable. But some of these previous studies are biased, because the clinician may favor one or the other approach, which influences the sample that is studied. However, an article that was published in the *Journal of Oral and Maxillofacial Surgery* (2010;68:1238–1241) summarized the results of a prospective, randomized clinical trial, where subjects were randomly allocated to either open or closed procedures following unilateral condylar fracture. The authors accumulated a sample of 32 subjects, with 16 in each surgical group. The definition of closed treatment included rigid maxillomandibular fixation for two weeks followed by elastic maxillomandibular fixation for an additional two weeks. The open reduction group was treated with miniplate osteosynthesis followed by elastic maxillomandibular fixation for two weeks. The patients were later assessed for maximal interincisal opening, protrusive movements, lateral excursive movements, pain in the TMJ, and malocclusion. The results of this study showed that there were no significant clinical differences between the patients treated with open reduction compared to those treated with closed treatment and rigid maxillomandibular fixation. However, radiographically, a better anatomic reduction of the condylar process was seen in the patients treated with open reduction.