What's New in Dentistry

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Immediate loading of single-tooth implants appears favorable. Since their reintroduction into dentistry 20 years ago, titanium implants have traditionally required a 4–6-month period of osseointegration prior to restoration and loading of the implant. However, in recent years, surgeons and restorative dentists have been gradually reducing the time between implant placement and occlusal loading. Now, a recent study published in the *International Journal of Oral and Maxillofacial Implants* (16:182–192, 2001) suggests almost immediate loading of single-tooth implants after insertion into the alveolus. The sample for this investigation consisted of 53 single-tooth implants placed in 47 subjects. All implants were placed in the maxillary anterior region: 19 central incisors, 25 lateral incisors, and 9 canines. Three weeks after implant placement, provisional crowns were placed on the implants, and they were allowed to undergo normal function. After 7–9 weeks, a permanent crown was placed on the implant. Radiographic evaluations were made at baseline (provisional restoration placement) and at 6, 12, 24, and 36 months after baseline. The authors evaluated the distance between the implant and the marginal bone level over time to determine if immediate loading caused any adverse effects on the surrounding bone. The results showed that the mean change in marginal bone level was 0.4 mm at 12 months. Two implants failed before final crown cementation. Therefore, the survival rate at 36 months was 96.2%. This study strongly suggests that loading of anterior maxillary single-tooth implants 3 weeks after placement does not jeopardize the long-term success rate of the implant restoration.

Restoration of posterior edentulous spaces may not enhance survival of adjacent teeth. Many adult orthodontic patients have posterior edentulous spaces due to previous extraction of maxillary or mandibular first or second molars. A common goal of orthodontic treatment is to upright the teeth adjacent to the edentulous space prior to restoration with either a fixed or removable prosthesis. But is it absolutely necessary that all posterior edentulous spaces be restored? Does restoration of the adjacent teeth improve their survival? A study published in the *Journal of Prosthetic Dentistry* (85:455–460, 2001), compared the long-term survival of teeth adjacent to restored and nonrestored posterior edentulous spaces. The sample for this investigation consisted of 317 subjects who had a posterior edentulous space. They were placed into 3 groups: 239 were nonrestored, 65 had a fixed bridge replacing the missing tooth, and the remaining 13 subjects had a removable partial denture. The survival rate of the teeth adjacent to the edentulous spaces was evaluated after 10 years. The results showed a significant difference in survival among the 3 treatment categories. The difference in survival between the fixed bridges (92%) and nonrestored subjects (81%) was not statistically significant. However, there was a significant difference in the survival of the removable partial denture group (56%). Failure to replace a missing posterior tooth has been believed to result in several adverse consequences, including supra eruption of opposing teeth, tilting or drifting of adjacent teeth, and loss of proximal contacts, which could adversely affect the survival of adjacent teeth. However, this retrospective study shows that restoring the edentulous space with a fixed bridge only improves the 10-year survival of the adjacent teeth by only about 10% compared with leaving the space nonrestored.

Nontreatment and observation of anterior disk displacement may be advantageous. Anterior disk displacement without reduction is a common injury to the temporomandibular joint (TMJ) and may result in popping, locking, and pain in the affected TMJ. For years, controversy has existed regarding the method of treatment for anterior disk displacement. Some clinicians favor the use of occlusal splints, others recommend nonsteroidal antiinflammatory drugs, while other clinicians simply observe while the patient adjusts their diet and limits their mouth opening for a period of time. Which of these treatments is correct for anterior disk displacement without reduction? A study published in the *Journal of Dental Research* (80:924–928, 2001) compared 3 different treatments for anterior disk displacement. This was a randomized prospective clinical trial of 69 subjects with anterior disk displacement without reduction. The anterior disk position was confirmed with magnetic resonance imaging. Each subject was randomly assigned to 1 of 3 treatment groups. One group had absolutely no treatment other than change of diet and limiting mouth opening and was called the control group. A second group was given nonsteroidal antiinflammatory drugs to take 3 times a day on a regular basis. In the third group, in addition to the nonsteroidal antiinflammatory drugs, patients were given a flat-planed occlusal splint with even contact on all of the teeth. They were asked to wear the splint 24 hours a day. The groups were evaluated at 2, 4, and 8 weeks to determine the effect of treatment or no treatment on the patient's symptoms. The authors found that, after 8 weeks, all 3 groups improved and their symptoms were alleviated. Between-group differences were not highly evident. These results suggest that patients with anterior disk displacement without reduction will improve

with only minimal treatment intervention and no significant difference was evident between the treatments tested and the control condition.

Narrow-diameter implants are successful in the anterior maxilla. When titanium implants were introduced to the United States in the early 1980s, their application was primarily designed for totally edentulous patients. Usually, 6 implants would be placed in an edentulous mandible and a denture would be permanently fixed to the top of the implants. The diameter of these implants was 3.75 mm, and their strength and ability to resist fracture were tested extensively. However, these implants are often too large to be used as single-tooth replacements for maxillary lateral incisors. Narrower implants (3.25 mm) are easier to place and provide more room for interproximal bone and tissue in the maxillary lateral incisor region. However, there has been some concern about the strength of these narrower implants. A study published in the *International Journal of Oral and Maxillofacial Implants* (16:217–224, 2001) compared the survival rates of 3.75 mm and 3.25 mm when used to replace maxillary anterior teeth. The sample consisted of 55 patients. In 27 subjects, 3.75-mm-diameter implants were placed, and in the remaining 28 subjects, 3.25-mm-diameter implants were inserted. The survival of the implants was evaluated 6 months and 1, 2, and 3 years after loading. Two of the narrow-diameter implants were lost after 6 months, but no other failures were subsequently observed in either group after that time. Marginal bone loss around the implants was recorded radiographically for both groups and was similar at a mean of 0.4 mm from the first to the last evaluation. In conclusion, it seems that the narrow-diameter implants are strong enough to be used successfully to replace missing maxillary lateral incisors.

Midroot fractures of maxillary central incisors are not prone to tooth loss. Occasionally, children may traumatize and fracture their maxillary central incisors. In most cases, the fracture will involve the crown of the tooth. However, in a few instances, the root may suffer a horizontal midroot fracture. If these patients eventually require orthodontic therapy, what will happen to the fractured root? Should it be extracted? Does it require endodontic therapy? These and other questions regarding the survival of maxillary midroot fractures were answered in a study that was published in *Dental Traumatology* (17:53–62, 2001). The purpose of this study was to evaluate a series of 208 intraalveolar midroot fractures of the maxillary central incisors. The trauma had occurred over a 15-year period. First, the authors found that about a third of the root fractures actually developed hard tissue fusion or healing of the fractured root. In 10%, there was actually bone that developed between the two fragments. In about 20% of the fractures, the pulp necrosed and root canal therapy was required. The other 80% healed uneventfully and did not require endodontics. The authors found that those coronal fragments that were either repositioned or remained in contact with the root had the best chance of hard tissue fusion between the 2 parts of the root. The authors also compared splinted and nonsplinted teeth and found no difference in the frequency of healing. In addition, the authors found that a less rigid type of splinting was better for promoting healing of hard tissue across the fracture than a rigid splint. In conclusion, midroot fractures of maxillary central incisors have a high survival rate and do not often require endodontic therapy.