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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ANTIBIOTIC THERAPY EFFECTIVE IN JUVENILE PERIODONTITIS — In the past, severe periodontal disease affecting adolescents was called periodontosis. Today, however, researchers have reclassified this disease as localized juvenile periodontitis, an acute infection that occurs in young patients. Researchers have identified the bacteria that is responsible for the severe destruction that occurs with periodontosis around the maxillary and mandibular central incisors and first molars. As with other bacterial infections, antibiotics have been effective. But are antibiotics effective in juvenile periodontitis? The answer to that question was provided in a recent landmark article in *The Journal of Periodontology* (62:628-633, 1991). In this study, patients suffering from juvenile periodontitis were given tetracycline in the usual dosage of 250 mg tablets taken four times per day. The antibiotic therapy was given for a period of 6 weeks. At the completion of the experimental interval, the patients were evaluated and the pocket depths and attachment levels were measured. The patients were then evaluated 1 to 4 years later. The results of the clinical and radiographic examination of these subjects following tetracycline therapy show that 90% of the original sites had decreased in pocket depth by an average of nearly 4 mm. A comparison of radiographs taken before and after antibiotic therapy showed considerable bone repair had taken place. In conclusion, tetracycline is highly effective in treating localized juvenile periodontitis in teenage patients.

INCREASED POTENTIAL FOR FRACTURE WHEN DEBONDING BRACKETS FROM PORCELAIN VENEERS — As an alternative to anterior porcelain crowns, restorative dentists are now placing porcelain veneers in some patients. These laminate veneers are very, very thin. The purpose of making them so thin is that they can be bonded to enamel and still allow the color of the enamel to show through. However, some of these patients may eventually need orthodontic treatment. What happens when you have to debond a bracket from a laminate veneer? This question was explored in a recent article published in *The Journal of Prosthetic Dentistry* (66:631-637, 1991). The authors experimentally bonded porcelain veneers to a large sample of bovine mandibular central and lateral incisors. Two types of porcelains were used, Vitadur and Ceramco II. Orthodontic brackets were bonded to the porcelain veneers with the use of the silanating agent. In part of the sample, the surface of the veneers was roughened with a green stone. The researchers found that combining the silane coupling agent with roughening of the porcelain surface produced an adhesive strength that exceeded the cohesive strength of the porcelain. This resulted in higher incidence of porcelain fracture during debonding of the bracket. In addition, the Vitadur porcelain had a higher incidence of fracture than

the Ceramco II porcelain. So remember, when bonding brackets to anterior laminate veneers, use a silane coupling agent to prepare the porcelain, but don't roughen the surface with a green stone.

STAINLESS STEEL AND SILVER INCREASE THE STRENGTH OF GLASS IONOMER CEMENTS — Today, many orthodontists are using glass ionomer cements to cement orthodontic bands to teeth. Although the polyacrylic acid in the cement actually etches the surface of the enamel and bonds the cement to the tooth, the cement itself has disadvantages. This is due to the low tensile strength of the glass ionomer cement. Recently, however, researchers have been attempting to add strength to the cement by adding metal powders. The success of these new cements was reported in a recent issue of *The Journal of Dental Research* (70:1358-1361, 1991). The investigators tested three cements. The first was Fuji II+ Lumi Alloy, a conventional glass ionomer cement with spherical amalgam powder as an additive. The second product was Ketac-Silver, a blend of aluminosilicate glass fused on to fine silver particles. The third cement was Fuji Type II glass ionomer cement with the addition of stainless steel powder. The researchers tested the compressive and tensile strengths of these materials. The results of this study clearly show that stainless steel reinforced glass ionomer cement has significantly greater compressive and tensile strengths than either of the cements with silver particles. The authors attribute the dramatic improvement in compressive and tensile strengths to the increased adhesion between the stainless steel filler and the polyacrylate matrix of the glass ionomer cement.

NEW AUTOGENOUS TMJ DISC REPLACEMENT — Over the past 30 years, researchers have been experimenting with various materials that can be placed in the TMJ and used as a substitute for the disc. One of the most popular was Silastic, although researchers now know that Silastic can only be used temporarily. Recently, however, researchers have been experimenting with autogenous materials placed in the temporomandibular joint to serve as a disc. A new promising technique was reported in a recent issue of *The Journal of Oral and Maxillofacial Surgery* (49:476-481, 1991). In this study, the authors initially removed the damaged disc and placed a sheet of Silastic as a temporary replacement. After 6 months, the Silastic was removed and replaced with a piece of pericranial tissue that was taken from the area adjacent to the ear. The scar is beneath the hair and is unnoticeable. Eighty-three grafts were performed and the patients were re-evaluated an average of 20 months after the surgery. The results of this study showed that the pericranial grafts worked out very nicely as a replacement for the disc during the experimental period. Forty-eight out of the 55 patients reported complete resolution of any temporomandibular joint symptoms after replacement of the disc with the pericranial graft. In addition, the postoperative occlusion remained stable. The authors believe that the pericranial tissue is biologically suited for TMJ reconstruction since it is durable, tough, and resilient.

GROWING BONE OVER EXPOSED TITANIUM IMPLANTS — By now, all dentists have heard of titanium implants. These metal implants have revolutionized prosthodontics and restorative dentistry. In fact, treatment for many orthodontic patients is now being planned to include titanium implants. In the past, placement of the implants has depended upon the width of the alveolus. In other words, if the alveolar housing was too thin, the implants couldn't be placed because the threads of the implant would be exposed. However, new techniques are being developed to grow bone over the exposed threads in patients with thin alveolar housing. The results of these efforts were reported recently in *The International Journal of Periodontics and Restorative Dentistry* — 11: 273-281, 1991). This study was performed at the Branemark Clinic in Goteberg, Sweden. These researchers have been pioneers in implant research. Implant fixtures were placed in six patients. All of the implants had exposed threads on the buccal and lingual surfaces. A semipermeable membrane called Gore-Tex was adjusted to cover the exposed portion of each fixture. The membrane remained in place for 4 to 6 months. When the implants were uncovered to determine the changes that had occurred, the amount of bone covering the threads was remeasured. In all patients, there was bone growth above the original level. The amount of bone regeneration averaged 2 mm. In conclusion, this study shows that Gore-Tex may be used to promote bone formation over the exposed threads of titanium implants.