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.*

DENTAL SEALANTS NOT PREVALENT IN THE UNITED STATES—After acid-etch bonding became popular in the mid-1970s, dental sealants were developed as a method of preventing plaque from colonizing the grooves and fissures in the posterior teeth of children. This concept makes sense. Research in recent years has shown that dental sealants in conjunction with the use of fluoride greatly reduces the incidence of caries in children. However, a recent study published in the Journal of Dental Research (1996;75:652-660) shows that the use of dental sealants in the United States population is relatively low. In an extensive study carried out by the National Institute of Dental Research between 1988 and 1991, the prevalence of dental sealants was assessed. Only 18% of U.S. children between 5 and 17 years old had a sealant on one or more permanent first molar. This number is surprisingly low, considering the beneficial effects of sealants. However, there was good news in the study. In a similar investigation of children three years earlier, only 7% had sealants on their teeth. So although the number of children with sealants is low, it is gradually increasing. Dental sealants would be especially beneficial for patients undergoing orthodontic therapy.

CHLORHEXIDINE CHEWING GUM REDUCES PLAQUE FORMATION—Research over the past 10 to 15 years has established that chlorhexidine is an excellent plaque-inhibiting agent. Peridex mouth rinse contains chlorhexidine and is used by patients who are susceptible to periodontal breakdown. In recent years, researchers have developed alternative methods of delivering chlorhexidine intraorally. A recent study, published in the Journal of Periodontology (1996;67:181-183), evaluated the effectiveness of chewing gum containing chlorhexidine. Previous studies have evaluated the effectiveness of chewing gum containing xylitol and sorbitol. Both types of gum exert a caries-reducing effect by increasing saliva secretion and raising the pH level. Chlorhexidine acts by preventing bacteria from colonizing within the plaque. In the study, patients chewed gum that contained either sorbitol, xylitol, or chlorhexidine gum for 20-minute periods three times a day, following meals. They did not use a toothbrush or dental floss to remove plaque from their teeth. After six days, they were tested to see if the chewing gum ingredients had an effect reducing plaque. In all subjects, the chlorhexidine had the greatest effect. In fact, in some patients the chlorhexidine gum reduced plaque even better than toothbrushing and flossing. Perhaps in the future, chlorhexidine gum can be used by noncompliant orthodontic patients as an adjunct to control plaque and reduce the potential for decalcificaiton around orthodontic brackets.

DISTRACTION OSTEOGENESIS INCREASES MANDIBULAR LENGTH IN ANIMALS—For years, orthodontists, have attempted to increase mandibular length by using functional appliances

that posture the mandible anteriorly. Although this type of treatment corrects a Class II malocclusion, the amount of increase in mandibular length is usually negligible compared with controls. In recent years, a surgical procedure called distraction osteogenesis has been used experimentally to lengthen the mandible in animals. This procedure was developed in Russia. In past experiments, either teeth or extraoral pins and posts have been used to deliver the distraction force across the osteotomy site. However, in a recent study published in the Journal of Oral and Maxillofacial Surgery (1996;54:594-600), an intraoral device using osseointegrated implants was used to support the distraction spring. Five dogs were used in this experiment. Two premolars were extracted on each side. After healing, two titaniaum implants were placed on each side in the area of the extraction sites. An osteotomy was performed between the implants and a screw-type distraction appliance was placed across the implants. The distraction device was activated 1 mm per day for 10 days. The process was successful. The mandible was made longer, and none of the implants failed. The force on the implants did not cause the implants to move or lose integration. In the future, in growing patients with significant mandibular hypoplasia, it may be possible to use osseointegrated implants in conjunction with distraction osteogenesis to increase mandibular length.

RESORBABLE MEMBRANES SUCCESSFUL IN CORRECTING PERIODONTAL DEFECTS—Periodontal therapy has changed radically in the past 10 years. Traditional concepts of surgical resection and bone removal have been replaced by regenerative therapy. Periodontists now use membranes to prevent epithelial invagination after surgery in order to permit bone regeneration in periodontal defects. However, in the past, this type of treatment required a second surgical procedure to remove the membranes. Recently, researchers have attempted to develop resorbable membranes. A study published in the Journal of Periodontology (1996;67:217-223) compared healing responses in humans treated with resorbable and nonresorbable membranes. The sample consisted of 36 patients. All had periodontal defects. The sample was divided into three groups. One group received conventional periodontal therapy with curettage of the osseous defect. In the other two groups, either resorbable or nonresorbable membranes were used to regenerate bone. The samples were evaluated at 1 year to determine the differences. Patients in the groups treated with membranes were significantly better than those treated with a conventional type of surgical procedure, and the bioresorbable membranes were as effective as the nonresorbable membranes. In the future, periodontists will be able to avoid a second surgical procedure by using resorbable membranes to regenerate bone in periodontal defects.

ASYMPTOMATIC PATIENTS MAY HAVE ANTERIOR DISC DISPLACEMENT—Anterior disc displacement is usually diagnosed clinically. If the disc is displaced, the temporomandibular joint usually pops or clicks as the patient opens and the condyle moves into the disc. If a patient opens and closes with no joint sounds, it is assumed that there is no disc displacement. However, a study published in the Journal of Prosthetic Dentistry (1996;75:529-533) shows that disc displacement may occur even in asymptomatic individuals. In this investigation, 80 asymptomatic volunteers were compared with over 250 patients with popping and clicking of the temporomandibular joint. Magnetic resonance imaging was performed on all patients. The authors wanted to determine the percentage of asymptomatic individuals who had a displaced disc that was undetected with clinical evaluation. In this study, 33% of the asymptomatic individuals had anterior disc displacement that was confirmed with magnetic resonance imaging. Another surprising finding was that 16% of the symptomatic patients did not have a displaced disc. In conclusion, clinical examination and the presence or absence of joint sounds does not always confirm a diagnosis of disc displacement. A relatively high percentage of asymptomatic patients may have an anteriorly displaced disc. Magnetic resonance imaging is an effective nonradiographic method of confirming the diagnosis.