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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RESORBABLE PLATES AND SCREWS FOR ORTHOGNATHIC SURGERY: Today, rigid internal fixation is becoming the most common means of fixing bony fragments following orthognathic surgery. There are many advantages to rigid internal fixation. However, one problem is that the large metal plates and screws are left in the bone after the surgical site has healed. Removing them requires an additional surgical procedure. However, researchers are now experimenting with resorbable plates and screws. Their preliminary findings were published in the *Journal of Oral and Maxillofacial Surgery* (49:512-516, 1991). These researchers used Poly-L-Lactide plates and screws in their experiment. These were placed in the ribs of experimental animals. During the experiment, different kinds of stress were placed on the screws and plates to determine if they would stay intact and not break. Although there were some problems associated with the strength of the materials, the researchers believe that these are merely technical problems that can eventually be worked out. In conclusion, it seems that the biochemical properties of the Poly-L-Lactide screws and plates are promising. Researchers will need to perform several additional animal experiments before using the resorbable screws and plates in humans.

IMMEDIATE IMPLANTS IN FRESH VERSUS HEALED SITES: Dental implants are currently receiving widespread recognition and use in dentistry. While the major thrust of dental implants has been to help secure complete dentures, a more common application today is becoming the replacement of isolated teeth or small segments of missing teeth. Usually implants are placed well after the extraction of a permanent tooth. However, today surgeons are suggesting the placement of implants immediately after the extraction of a tooth. Do immediate implants placed in fresh extraction sockets really work? This question was answered in a recent study published in the *Journal of Periodontology* (62:468-472, 1991). In a sample of 14 adult patients, pairs of implants were placed both in fresh extraction sockets and in healed edentulous sites. Six months after implantation, the two implants were connected with a fixed bridge. Then the soft and hard tissue conditions around each of the implants were evaluated every 4 months up to 18 months. The results of this study show that the periodontal health, maintenance of crestal bone levels, and implant stability were excellent for both types of recipient sites. None of the implants were lost. This study shows that immediate placement of implants into fresh extraction sockets may be advisable to preserve alveolar bone in some patients.

POWDER/LIQUID RATIO CRITICAL FOR POLYCARBOXYLATE CEMENT: Polycarboxylate cement (Durelon) is used by many orthodontists to cement molar bands. This type of cement is consistently stronger than other types of cement. However, the material is very viscous. In order to reduce the viscosity, clinicians often mix a thinner consistency by adding more liquid. However, a recent study published in the *Journal of Prosthetic Dentistry* (66:49-51, 1991) shows that there are critical limits to

varying the powder to liquid ratio. This research project was performed in vivo by placing three different powder/liquid ratios of polycarboxylate cement in specially prepared restorations. Ratios of 1.5:1, 1.25:1, and 1:1 were measured. The experiment lasted 6 months. The results of this study show that there was a significant difference in cement loss or solubility among the ratios tested. A powder to liquid ratio of 1.5:1 had significantly less solubility than either the 1.25:1 or 1:1 ratios. For orthodontists who use this type of cement, this study suggests that the powder to liquid ratio should be carefully measured and mixed to avoid wash-out of the cement during the time that the molar bands are in place.

OCCLUSAL SEALANTS EFFECTIVE OVER LONG-TERM: Most young orthodontic patients have pit and fissure sealants placed in their permanent molars. Now that sealants have been used for a period of time, researchers are able to look back to evaluate their effectiveness. Long-term data were published in a recent study in the *Journal of Dental Research* (70: 1064-1067, 1991). This research project is based upon material collected in Helsinki, Finland. A group of 400 adolescents was evaluated over an 8-year period to determine the status of permanent first molars that had been sealed at an early age. The results of the study show that those first molars that had been sealed at age 7 developed fewer caries than those in any other group during the follow-up. Ninety percent of the sealed permanent first molars were still sound at the end of the experimental period. However, the researchers found that some of the sealants eventually break down or become dislodged. The authors recommend early sealing of permanent first molars followed by resealing at later years to avoid the development of caries.

SELF-CURED VERSUS LIGHT-CURED COMPOSITE RESINS: Many orthodontists use bonded mandibular lingual retainers after orthodontic treatment. When bonding the retainer to the lingual surfaces of the teeth, there is a choice between using a light-cured or chemically-cured resin. In the past, it has been thought that light-cured resins would provide harder surfaces after curing, and therefore have greater longevity intraorally. However, a recent study published in the *Journal of Prosthetic Dentistry* (65:215-220, 1991) does not verify this belief. The purpose of this experiment was to measure the hardness of eight different composite materials. Four were light activitated and the other four were chemically activated composites. Hardness measurements were made on a graduated scale up to 1 year. The results of this study show that all specimens showed their highest value for hardness at 4 weeks. From that point up to 1 year, the surface hardness of the light-cured and self-cured resins was nearly the same. There were no differences in the microhardness, and therefore in the abrasion resistance between the two types of curing.