

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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SETTING TIME IMPORTANT FOR GLASS IONOMER CEMENTS

Although most orthodontists bond brackets to the majority of teeth, bands are still routinely placed on molars, especially in cases where headgear will be worn. Today, many orthodontists are using glass-ionomer cement to adhere bands to teeth. A recent study published in the Journal of Dental Research (72:481-483, 1993) shows that the glass-ionomer cements gain strength over time. The researchers in this study prepared various samples of cement and then stored them for 1 day, 1 week, 1 month, 3 months and 6 months. After each of these storage intervals, the compressive strength of the cement was tested. From a clinical standpoint, there was no significant change in the strength of the glass-ionomer cement after 1 week. However, a significant difference was found between the 1-day and 1-week specimens. In conclusion, the glass ionomer cements reach their maximum strength after 1 week. Heavy forces, such as headgear, should not be applied immediately after cementation with glass-ionomer materials.

NEW DATA ON FAILURE RATE OF MARYLAND BRIDGES

Maryland or resin-bonded bridges are commonly used to replace missing maxillary and mandibular anterior teeth. With the improvement in bonding techniques, these prosthetic replacements have become more popular than the conventional types of anterior restorations. But how long do they last? How often do they become dislodged? These questions were an-

swered in a study published in the Journal of Dental Research (71:1822-1825, 1992). In this prospective study, 200 resin-bonded bridges were placed in the maxillary and mandibular anterior regions. In one group of patients, the metal framework was perforated for added retention. In the other group, the undersurface of the metal was etched. The sample was followed for over 7 years. At that time, 75% of the anterior bridges were still in place. Therefore, the failure rate or debonding rate was 25%. The etched metal framework showed a much higher survival rate than the perforated bridges. Anterior overbite also affected the survival rate. Those patients with a deep overbite had more failure of the resin-bonded bridges than those with a normal overbite relationship.

NEW SITE FOR DONOR BONE IN MAXILLARY SURGERY

Maxillary surgery often requires bone grafting. The most common site for harvesting cancellous bone is the hip. Unfortunately, hip surgery is often more uncomfortable than the maxillary procedure. Today, surgeons are experimenting with bone harvested from different sites. A recent study published in the Journal of Oral and Maxillofacial Surgery (50:1258-1263, 1992) described a new donor site with minimal postoperative morbidity. In a series of 22 patients, cancellous bone was harvested from the proximal tibial metaphysis. The specific area is located high in the tibia, just below the knee. The patients were followed for 6 months to determine whether or not problems occurred after harvesting the graft from this site. During the

follow-up period, all patients had minimal leg pain. There were no short-term or long-term disturbances in leg function. Pain was easily controlled with nonsteroidal anti-inflammatory medications. In conclusion, this new donor site may be a promising way to avoid the typical morbidity that occurs when bone grafts are harvested from the hip.

PERIODONTAL LIGAMENT FORMATION ON TITANIUM IMPLANTS

— Implants have revolutionized dentistry. Thousands of implants are now placed annually in the United States. These rigid posts allow dentists to reconstruct mouths where teeth have been missing for many years. When an implant becomes surrounded by bone, it is immobile. If an implant is attached to a natural tooth, it would be beneficial to have a periodontal ligament around the implant. Is this possible? A recent study published in the *Journal of Periodontology* (64:29-34, 1993) tests this question. Researchers extracted mandibular premolars in monkeys, but intentionally fractured the teeth so the apices remained in the bone. Titanium implants were then placed in close proximity with the periodontal membrane surrounding the root fragment. The implants were covered and allowed to integrate with the bone for 3 months. Subsequent histologic evaluation showed that cementum was generated by cells that came from the periodontal membrane space. In those areas

where cementum covered the implant, collagenous fibers inserted into the cementum and were identical to the periodontal membrane found around the adjacent root tip. In conclusion, a periodontal membrane can form around a titanium implant if cementum covers the surface of the implant initially.

CAN HIV BE ELIMINATED FROM BONE ALLOGRAFTS?

— Today, bone grafting is common during maxillofacial and periodontal surgeries. In many situations, the bone is obtained from a bone bank. This bone is originally harvested from the skulls of cadavers. A rising concern has been the contamination of HIV in the bone. However, a recent study published in the *Journal of Periodontology* (63:979-983, 1992) sheds new light on this issue. These researchers obtained human bone from a bone bank. They added the HIV virus then put the bone particles through the typical purifying procedures performed by the bone bank. In a second sample, bone harvested from a patient who died of AIDS was purified in the same manner. After the purification process, the bone was tested to see if the graft material contained the HIV virus. In both cases, the virus had been destroyed. In conclusion, normal processing procedures at the bone bank are sufficient to eliminate the possibility of contamination with the HIV virus.