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."*

By Vincent G. Kokich, DDS, MSD

ARTHROSCOPIC SURGERY IS VERY EFFECTIVE AT REDUCING TMJ PAIN — Arthroscopic surgery has become a very common means of treating joint problems in various parts of the body. It is particularly effective for treatment of problems in the knee. Recently, temporomandibular joint arthroscopy has become a more common treatment modality for a variety of TMJ abnormalities. But are these arthroscopic procedures really effective at eliminating temporomandibular joint symptoms? This question was answered in a recent article published in the *Journal of Oral and Maxillofacial Surgery* (48:1029-1032, 1990). In this study, Dr. David Perrot and his colleagues set up prospective guidelines for a complete clinical evaluation of therapeutic arthroscopy for patients with pain, TMJ noise, and decreased motion. Their paper represents findings on the first 59 patients treated. All 59 patients had received nonsurgical therapy previously which had failed to adequately control their symptoms. Therefore, superior joint arthroscopy, lysis of adhesions, lavage, and injection of a steroid solution were completed on each of these 59 patients. After surgery, all patients received a flat plane stabilizing bite appliance. The patients were evaluated at least six months after the surgery. The surgery produced a statistically significant increase in the range of motion in these patients. In addition, deviation increased in all patients. The study also showed that joint noise was significantly reduced. However, the presence or absence of noise did not correlate with pain relief or improvement in motion. There was a significant reduction in the pain level in these patients. However, although significant clinical improvement with decreased pain and increased motion occurred in the majority of patients, this could not be correlated with radiographic changes and disc position. This was confirmed in 29 patients who had had preoperative and postoperative MRI scans. In conclusion, this prospective study showed that TMJ arthroscopy is effective in reducing pain and increasing motion in patients with internal derangement. However, this procedure has little or no effect on the position of the disc.

DOES MERCURY VAPOR ESCAPE FROM AMALGAM RESTORATIONS? — As orthodontists, many of us treat patients who have amalgam restorations. In fact, many orthodontists also have amalgam restorations in their mouths. Recently in the news, there have been claims that mercury escapes from these amalgam restorations and that the effects are toxic. But are these claims really true? A recent study in the *Journal of Dental Research* (69:1646-1651, 1990) reported the results of a study which evaluated this issue. The purpose of the study was to determine the daily dose of inhaled mercury caused by evaporation from dental amalgam restorations. The test sample for this study consisted of 15 healthy people with an average of 27 surfaces that had been restored with dental amalgam. These subjects were compared to a sample of five healthy people without any amalgam restorations. These individuals were examined over a 24-hour period. Each of the subjects had to eat, drink, and brush his or her teeth at predetermined time periods. The amount of mercury vapor released in the oral cavity was measured by absorption spectrophotometry. The results of this study show that mercury vapor is released from amalgam restorations. No vapor was found in the nonrestored individuals. Chewing during ordinary meals caused no significant increase in the rate of release of mercury vapor. Interestingly, tooth brushing or abrasion of the amalgam

surface caused a significant release of mercury vapor. Although mercury vapor is released from amalgam restorations, the author estimated that this amount was only about 1% of the threshold limit value set for mercury vapor. The threshold limit value of a substance is the concentration to which nearly all workers can be exposed eight hours a day, five days a week for prolonged periods without suffering adverse health effects. In conclusion, although mercury evaporates from amalgam restorations, the amount of vapor is too small to cause toxicity.

DOES SMOKELESS TOBACCO CAUSE PERIODONTAL DISEASE? — Many orthodontists treat adolescent males who use smokeless tobacco. Many of these individuals are involved in sports, especially baseball. The periodontal effects of smokeless tobacco are controversial. Gingival recession as well as white lesions have been reported in some, but not all users. However, a recent study surveyed 1100 professional baseball players and employees from seven major league baseball teams. These examinations were completed during spring training camp. The purpose of the study was to further characterize the oral effects of smokeless tobacco. The results were published in the *Journal of Periodontology* (61:438-443, 1990). Each of the professional athletes and employees completed a comprehensive questionnaire that elicited information about the use of smokeless tobacco. Then an oral examination was performed to determine the location, size, color, contour, and texture of all mucosal and gingival pathology. Based upon the self-questionnaire, about 40% of the 1100 individuals admitted being users of smokeless tobacco. About half of these current users had mucosal lesions that were clinically characteristic of smokeless tobacco-induced leukoplakia. These were white lesions that affected about four to five teeth. Nearly all of the lesions affected the mandibular teeth. Furthermore, this study shows that about 30% of these mandibular lesions showed recession. This observation was most pronounced on the mandibular incisors and premolars. Finally, the researchers found that there was no higher predilection for any other types of periodontal problems in those patients that used smokeless tobacco.

RELAPSE AFTER MANDIBULAR SETBACK SURGERY DESPITE RIGID FIXATION — In the past, the correction of mandibular prognathism with sagittal osteotomy and setback of the mandible has met with varying degrees of postsurgical stability. With transosseous wire fixation of the bony fragments, many orthodontists have experienced significant relapse and a tendency toward an end to end occlusion. However, with the introduction of rigid fixation in recent years, orthodontists had hoped for a resolution of this instability. But has that really occurred? Has anterior relapse of the mandible after mandibular setback surgery been prevented with rigid fixation? That controversial question was addressed in a recent study published in the *Journal of Oral and Maxillofacial Surgery* (48:817-822, 1990). The purpose of this study was to quantitatively evaluate the amount of postsurgical change following mandibular setback surgery. The sample consisted of 25 patients with an average age of 23 years. All patients had mandibular prognathism and underwent a combination of orthodontic treatment and a sagittal ramus osteotomy to correct the malrelationship. The bony fragments were stabilized with rigid fixation using three screws per side. The patients were analyzed by cephalometric radiographs taken presurgically, within one week after surgery, and at a follow-up period that averaged 15 months. The average amount of mandibular setback was 5 mm. When the sample was evaluated 15 months after surgery, about three-quarters of the sample showed anterior sagittal relapse. For those patients who had relapse, the change was about 20% of the original correction or approximately 1 mm. The authors found that there was no relationship between the amount of surgical setback and the amount of relapse. The authors believe that the amount of relapse is small enough to be of little clinical importance and can be compensated for by postoperative orthodontic movement.

DILANTIN HYPERPLASIA IS SIGNIFICANTLY WORSE IN CHILDREN — As orthodontists, we are well aware of the potential problems for the patient taking Dilantin during orthodontic treatment. With the placement of orthodontic appliances, the potential for gingival overgrowth seems to be exacerbated. But why does this overgrowth occur in the first place? Is it related to age? Is it related to the dosage level of Dilantin? These questions were answered recently in a comprehensive study published in the *Journal of Periodontology* (61:571-574, 1990). In this study, Dr. Penarocha-Diago studied 60 epileptic patients who were being treated with Dilantin. The sample was evenly split among males and females. The age range of the sample was 7 to 65 years with an average age of 30 years. Each of the patients had been taking Dilantin for at least six months and the average duration of drug intake was about 6 years. The results of this study show that not all patients taking Dilantin have adverse gingival responses. In this study, 30 out of the 60 patients studied, or 50%, showed significant overgrowth of the gingiva. This supports the idea that the response is actually genetically based. In addition, Dilantin-induced gingival overgrowth was greater among younger patients. The results show a positive correlation between the amount of plaque and the severity of the gingival overgrowth. Those patients with poorer levels of oral hygiene tended to have greater overgrowth of the gingiva. On the other hand, these authors did not find a significant correlation between either the amount of Dilantin or the duration of drug intake and the degree of gingival overgrowth. The authors recommend frequent recalls for professional cleaning as well as occasional gingivectomy to increase clinical crown length to help minimize inflammation and facilitate proper oral hygiene.