## What's New in Dentistry

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Sealed carious fissures in molars are prone to microleakage. Sealing of carious fissures in molars is considered an appropriate treatment option for arresting the caries process in children. However, a retrospective evaluation has shown that cariogenic microorganisms were found in 50% of sealed teeth, and the dentin was soft and moist, indicating the presence of active caries. Therefore, a major prospective investigation published in the Journal of Dental Research (2008;87:495-498) evaluated the efficacy of sealing carious fissures. The sample consisted of 80 molars, each with an occlusal fissure that had caries that communicated into the dentin. These lesions were treated according to five experimental protocols and compared with a control group of sealed noncarious fissures. The various groups either used no primer or bonding adhesive or a combination of these materials in each of the groups. After the application of the materials, the teeth were thermocycled and then immersed in a dye to determine if the dye could penetrate through the various sealed surfaces. Based upon careful sectioning and microscopic evaluation after the experiment, the authors found that sealed carious fissures showed significantly more microleakage and insufficient sealant penetration depth compared to the noncarious fissures. In addition, neither the use of an adhesive nor its intermediate curing influenced the microleakage score and the penetration ability of the sealants. The authors concluded that sound fissures can be sealed with resin more adequately than cavitated carious fissures.

Distraction osteogenesis is successful for creating a new TMJ. Reconstruction of the temporomandibular joint (TMJ) is a tremendous challenge for the oral and maxillofacial surgeon. This type of surgery is often necessary in patients with TMJ ankylosis, tumor resection, traumatic injury, or rheumatoid arthritis. However, a study published in the *Journal of Oral and Maxillofacial Surgery* (2008;66:718–723) has shown that distraction osteogenesis can be a predictable and successful method for recreating the temporomandibular joint. The sample for this investigation consisted of 12 adult patients who had a total of 13 reconstructions of their ramus/condyle unit. All procedures were performed using an internal, unidirectional distractor, with the length of distraction ranging from 13 to 30 mm. During the operation, the ramus was approached from the posterior, and a small transport disc was created by sectioning a portion of the posterior border of the ramus. After a latency period of 7 days to permit fibrous callous formation, the distraction occurred at the rate of 0.5 mm twice daily. The duration of the distraction was determined based on the size of the defect. After a consolidation period of 3 months, the distractor was removed. These 12 reconstructions were followed for between 7 and 56 months. In all cases, solid regenerate bone was formed in the distraction gap. Maximum interincisal opening was improved in all patients treated for ankylosis. All of the other eight patients maintained a range of motion at about their previous level. None of the 12 patients underwent multiple operations or had chronic pain. The authors conclude that transport distraction osteogenesis is a promising treatment option for TMJ reconstruction.

Smoking has negative effects on subepithelial connective tissue grafts. A common method of covering the roots of teeth that have experienced gingival recession is to place a subepithelial connective tissue graft. Previous studies have shown that this procedure is highly predictable and successful. However, it has been well established that nicotine in cigarette smoke produces ischemia due to vasoconstriction of the blood vessels in the gingival tissues. A study published in the Journal of Periodontology (2008;79:1014-1021) compared the success of subepithelial connective tissue grafts in smokers and nonsmokers. The sample consisted of 30 subjects who were divided equally into smokers and nonsmokers. Each subject had one nonmolar tooth that had significant gingival recession. Each of these recessions was treated surgically with a coronally positioned flap associated with a subepithelial connective tissue graft. Clinical measurements of the pocket depth, clinical attachment level, amount of gingival recession, and width of keratinized tissue were determined at baseline and 3 and 6 months after the surgery. The results of this study showed that after 6 months, there was a gain in clinical attachment, a decrease in gingival recession, and an increase in keratinized tissue for both groups. However, smokers had less root coverage than nonsmokers. Furthermore, the smokers had more gingival recession than the nonsmokers. The mechanism of the effect of the nicotine is to reduce collagen production as well as fibroblast function and proliferation. Therefore, the authors conclude that root coverage with subepithelial connective tissue grafting is negatively affected by smoking, which limited and jeopardized the treatment results.

Chronic ethanol consumption increases periodontal inflammation. Chronic alcohol consumption leads to the generation of excess amounts of reactive oxygen in the liver. As a result, these conditions increase the blood levels of reactive oxygen. Since tissue oxidative damage, induced by reactive oxygen, is involved in the pathogenesis of periodontal disease, researchers have postulated that increased circulating reactive oxygen following ethanol consumption may be detrimental to periodontal health. A research project published in the Journal of Dental Research (2008;87:456-460) examined the effect of chronic ethanol on the periodontium of experimental animals. The sample consisted of 28 male rats at 10 weeks of age. They were divided into four groups. The first two groups were provided a liquid diet containing ethanol at 36% of total caloric value. One of these groups had ligature-induced periodontitis and the other had a healthy periodontium. The remaining two groups were provided a normal diet without ethanol, and one of these groups also had ligature-induced periodontitis. The experimental period lasted for 8 weeks, after which the authors evaluated the gingival tissues histologically and also determined the clinical attachment levels in all groups. The authors observed that the distance between the cemento-enamel junction and the alveolar bone crest in rats with and without induction of periodontitis was increased by ethanol feeding, which indicates alveolar bone resorption. These results suggest that ethanol consumption can cause destruction of the periodontium and is associated with local alterations in reactive oxygen balance. The authors conclude that ethanol consumption not only results in hepatic inflammation, but also negatively affects periodontal health.

Specific bisphosphonates may increase risk for osteonecrosis. Oral bisphosphonates are osteoclast inhibitors that are used for the management of osteoporosis. Intravenous bisphosphonates, such as zoledronate, are used primarily to treat hypercalcemia, lytic bone lesions in multiple myeloma, or metastasis bony lesions in tumors. Recently, osteonecrosis of the jaw has become a major concern for cancer patients taking these drugs. Are there certain drugs and other cofactors that lead to a higher risk of osteonecrosis when taking intravenous bisphosphonates? A casecontrol study design was published in the Journal of Oral and Maxillofacial Surgery (2008;66:625-631) that assessed the risk that intravenous bisphosphonates pose in the development of osteonecrosis in cancer patients. The sample consisted of 30 cases of osteonecrosis that had been identified and treated at a major US hospital over a 4-year period. Then the authors determined which intravenous bisphosphonates were involved and whether any other confounding factors added to the potential risk for osteonecrosis. The authors found that zoledronate was found to confer significant risk toward the development of osteonecrosis of the jaws. In fact, the authors calculated a 30-fold increased risk for individuals taking intravenous zoledronate to develop osteonecrosis. In addition, the authors found that obesity provided a 16-fold increased risk and smoking added another 7-fold increase in risk of developing osteonecrosis when taking intravenous zoledronate. In conclusion, patients taking intravenous zoledronate are at a significant risk for developing osteonecrosis of the jaws following oral surgery.