What's New in Dentistry

Vincent Kokich, DDS, MSD

Acidic drinks promote dentinal erosion. Daily use of acidic beverages is common among teenagers. These beverages contain several acids such as citric acid, phosphoric acid, maleic acid, and others that are commonly used in restorative dentistry to etch both enamel and dentin. The pH of these acidic drinks may be very close to 2.0 or 3.0 and may etch exposed dentin. A recent study published in the *Journal of Periodontology* (2003;74:428–436) evaluated the in vitro effect of various commercially available acidic drinks on dentinal discs from human third molars. Each dentinal disc was exposed to the following acidic drinks for five minutes: cola drink (phosphoric acid), orange fruit juice (ascorbic and citric acid), white wine (tartaric acid), vinegar (acetic acid) and mucolytic syrup (benzoic and tartaric acid). Dentinal tubule permeability was then measured at each step to determine the amount of erosion. This study demonstrated that acidic drinks increase dentin permeability by dissolving the smear layer and smear plugs. The erosion of the peritubular dentin and smear plug removal is the main agent responsible for the increase in dentin permeability and probably for clinical dentin hypersensitivity. This study concludes that the use and abuse of acidic drinks may damage dentin and increase the risk for dentin hypersensitivity.

Parathryoid hormone protects against periodontal bone loss. Parathryoid hormone functions as a major mediator of bone remodeling. In addition, intermittent administration of parathyroid hormone promotes bone formation. Could this effect be used to reduce the bone loss that occurs during periodontal disease? A study published in the *Journal of Dental Research* (2003;82:791–795) investigated whether intermittent administration of parathyroid hormone in rodents would block the alveolar bone loss observed in rats, when a ligature is used to promote periodontal bone loss. Twenty Wistar rats were used in this study. A ligature was placed around a mandibular first molar in each animal. The contralateral molar was left unligated to serve as a control. Then the animals were given either a placebo or parathyroid hormone intermittently over a 30-day period. Histologic analysis of sections obtained from ligated teeth in animals given the placebo showed significant bone loss in the molar furcation areas. However, the ligated molars in the animals that received intermittent parathyroid hormone showed no bone loss within the furcation area. This study suggests that intermittent administration of parathyroid hormone may protect against bone resorption associated with periodontitis.

Effects of nicotine and cigarette smoke on implant healing. Previous studies have shown that smoking has a negative effect on the healing of bone around titanium implants. However, is it the nicotine or the cigarette smoke that interferes with healing? A study published in the *Journal of Periodontology* (2003;74:1454–1459) evaluated the effects of both of these potential irritants on implant healing. Forty-five Wistar rats were used in this study. Screw-shaped titanium implants were placed bilaterally in the tibiae in each animal. Then intermittent cigarette smoke inhalation or subcutaneous administration of nicotine was applied twice daily for 60 days in each group. A third group was the control. Then the degree of bone-to-implant contact and the bone area within the implant threads were measured in both cortical and cancellous bone areas. This study showed that cigarette smoke produced a significant negative influence on both bone to implant contact and bone area in both the cortical and cancellous bone areas. In contrast, the administration of nicotine did not influence either bone implant contact or bone area in cortical bone, but partially contributed to bone loss in cancellous bone. This study has shown that it is actually cigarette smoke and not nicotine that produces the most significant disturbance in the healing of bone around titanium implants.

Risk factors for complications after third molar extraction. Although third molar extraction is a routine procedure for most patients, occasionally problems will occur. It is advantageous if the surgeon can predict which patients will be more difficult and take precautions to avoid complications. A study published in the *Journal of Oral and Maxillofacial Surgery* (2003;61:1379–1389) performed a retrospective cohort study of nearly 600 patients to identify the types, frequency, and risk factors for complications after third molar extractions. The sample consisted of patients who had one or more third molars removed. The average age of the patients was 26 years. The overall complication rate was 4.6%. The authors found that increasing age, a positive medical history, and the position of the third molar relative to the inferior alveolar nerve were associated with an increased risk for complications. Unfortunately, these three factors (age, medical history, and third molar position) cannot be directly modified or avoided. However, the authors believe that these three factors may be modified in-

directly. For example, the surgeon may recommend third molar extraction at the earliest age possible, or alter the clinical setting or anesthesia technique for patients with positive histories. Also, additional imaging techniques, modifying the surgical technique, or deferring extraction may be considered if the risk for nerve injury is high.

Effect of surface treatments on osseointegration of implants. A major factor in the success of implants is the surface property of the implant. A study published in the *International Journal of Oral and Maxillofacial Implants* (2003;18:349–356) compared the bone response around implants after sand blasting and thermal oxidation of the titanium surface prior to implantation. The sample consisted of 48 threaded implants. Two different samples were prepared. One group had titanium implants that were blasted with aluminum oxide particles. The second group had implants that were blasted with aluminum oxide particles and then thermally oxidized for two hours in a pure oxygen atmosphere. These different preparations produced implant surfaces with essentially similar chemical composition, but with different oxide thickness and roughness. Morphologic evaluation of the bone formation around the implants after four weeks revealed that the percentage of bone to implant contact of the oxidized implants was greater than that of the blasted group. After 12 weeks, the differences were not statistically significantly different between the groups. This investigation has demonstrated that blasting and oxidizing of an implant surface may have an early effect on in growth of bone into the implant threads. The exact mechanism by which the surface properties of the implant affect the process of osseointegration is not known.