

What's New in Dentistry

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Xylitol chewing gum effective at reducing maternal transmission of caries producing bacteria. It has been previously shown that oral *Streptococcus mutans* contained in the saliva of mothers is readily transmitted to newborn children during infancy. Obviously colonization of these bacteria on primary tooth surfaces could be responsible for causing childhood caries as teeth begin to erupt. It has also been observed that xylitol chewing gum is effective at reducing oral levels of *Streptococcus mutans* in adults. Could maternal chewing of xylitol gum assist in reducing levels of salivary bacteria in newborn children? That question was addressed in a study that was published in the *Journal of Dental Research* (2010;89:56–60). In this clinical investigation, researchers randomized 100 pregnant women with high salivary levels of *Streptococcus mutans* into two groups. One group began chewing xylitol gum at the sixth month of pregnancy and terminated gum chewing gum one year later. The control group did not chew xylitol gum. Then these researchers measured the presence of *Streptococcus mutans* in the saliva or plaque of the children up until age 24 months. The findings of this study showed that the xylitol-group children were significantly less likely to show colonization of the caries-producing bacteria than the control-group children between the ages of 9 and 24 months. In fact, the control-group children acquired *Streptococcus mutans* nearly nine months earlier than those in the xylitol-group, suggesting that maternal xylitol gum chewing shows significant beneficial effects at reducing maternal transmission of caries producing bacteria in children.

Euro-Collins solution effective at preserving avulsed teeth prior to replantation. Avulsion of anterior teeth in children presents significant long-term problems for the dental team. Although immediate replantation can have positive results, most avulsed teeth are not replanted immediately, and therefore the prognosis for successful re-establishment of the periodontal ligament is greatly reduced. Although bovine milk has been suggested as a preservation medium for the tooth root until it can be replanted, even this solution is not always successful. Euro-Collins solution is a medium that was developed for the

preservation of human organs for transplantation. Could Euro-Collins solution be successful for preserving the periodontal ligament on the roots of avulsed teeth and thereby increase the success of tooth replantation? That hypothesis was tested in a study that was published in the *Journal of Oral and Maxillofacial Surgery* (2010;68:111–119). The authors initially performed root canal therapy on 80 tooth roots in a sample of four young adult dogs. After two weeks, the tooth roots were extracted and assigned to one of four groups of 20 roots each. In one group, the roots were replanted immediately. In the second group, the roots were allowed to dry for two hours before replantation. In the third group, the roots were submersed in bovine milk for 8 hours and replanted. Finally, in the fourth group the roots were submersed in Euro-Collins solution for eight hours before replantation. After 90 days, the roots were examined histologically to determine the integrity of the periodontal ligament and the incidence of root resorption. These researchers found that root resorption occurred in all four groups. The most extensive resorption occurred in the group that was dried for two hours. However, the results of this study showed that Euro-Collins solution was the most effective storage medium and that the periodontal ligament fibers in this group were mature and well oriented within three months after replantation. The authors conclude that Euro-Collins solution is an adequate storage medium for keeping avulsed teeth prior to replantation.

Topical fluoride treatment reduces enamel surface roughness after tooth bleaching. Tooth bleaching has become a popular method of improving dental esthetics for some adults. However, the use of the typical bleaching agents, carbamide peroxide or hydrogen peroxide, could result in a roughened enamel surface. Would the application of stannous fluoride after bleaching reduce the surface roughness of enamel? A study published in *Quintessence International* (2010;41:71–78), evaluated the effect of various fluoride therapies on the surface of human dental enamel that had been exposed to bleaching agents. The sample for this study consisted of over 30 extracted human third molars that had been cut vertically into two specimens. Then these specimens

were separated into groups. One group was the control group that received no bleaching or fluoride treatment. The remaining groups were bleached with either commercially available carbamide peroxide or hydrogen peroxide according to the manufacturer's recommendations. After bleaching, the surfaces of the specimens were assessed for surface roughness. Then the specimens were either submerged in stannous fluoride or received an application of topical stannous fluoride at varying intervals of a three-week period. After three weeks of fluoride treatments, the enamel surfaces were again evaluated for surface roughness. Based upon their measurements, these researchers clearly showed that both carbamide peroxide and hydrogen peroxide do increase the surface roughness of human enamel. Furthermore, low concentration fluoride rinsing daily or weekly did little to reduce enamel roughness after bleaching. However, topical application of 2% stannous fluoride was effective at reducing the enamel roughness that occurred during tooth bleaching. The authors recommend the application of topical fluoride after tooth bleaching.

Titanium implants with an anodized surface encourage better cortical and cancellous bone healing. Implants are commonly used to replace missing teeth in adults. The majority of these implants is made of titanium and has either a smooth surface (machined) or rough surface (acid-etched or plasma-sprayed). However recently, a new method of altering the surface of titanium implants has been proposed. Microarc oxidation (anodization) of the implant surface has been shown to be favorable to the functional activity of the cells close to the implant surface. Does an anodized titanium implant encourage the healing of cancellous and cortical bone adjacent to the implant? A study published in the *International Journal of Oral and Maxillofacial Implants* (2010;24:655–662), compared the healing response around machined and anodized titanium implants in an animal experiment. The sample for this study consisted of New Zealand white rabbits. Screw-shaped implants were made with commercially pure titanium. Half of the implants had a machined, smooth surface. The other half of the implants had their surfaces anodized with microarc oxidation. Twelve of each of these types of implants were placed in the tibiae of rabbits and allowed to heal for one month. Then the authors evaluated the

histologic response of the cancellous and cortical bone around the implant surfaces. The results of this experiment showed that the percentage of bone-to-implant contact for the anodized implants was significantly higher in all cases than the control or machined-surface implants. The authors conclude that anodized surface modification of titanium implants is beneficial to both cortical and cancellous bone healing.

TMJ discectomy with dermis-fat grafting has a positive quality of life effect on patients with debilitating internal derangement. Oral health-related quality of life assessment has become a standard test used extensively in dental patients as a measure of the impact of disease on their perceived oral health. This assessment is especially valuable when assessing patients with temporomandibular disorders. After all, surgery of the temporomandibular joint could potentially affect many aspects of a patient's quality of life. Although TMJ surgery is often used as a last resort, in patients with debilitating internal derangement, removal of the meniscus (discectomy) and replacement of the disc with a dermis-fat graft may be the appropriate surgical procedure. Does this type of surgery have a positive or negative impact on the patient's perception of their oral health related quality of life? That question was addressed in a study that appeared in the *Journal of Oral and Maxillofacial Surgery* (2010;68:101–106). The sample for this study consisted of over 60 individuals who had advanced TMJ internal derangement. Half of the sample was awaiting TMJ surgery. The other half of the sample had already undergone TMJ discectomy with interpositional dermis-fat grafting for the management of the internal derangement. Both groups were matched with respect to age and gender, as well as clinical and radiologic diagnoses. These two groups were given a carefully designed survey, which could assess the patient's perception of their quality of life relative to their TMJ disorder before and after the TMJ surgery. The study found that post-TMJ surgery patients showed statistically significant decreases in pain levels, diet and chewing, mood, anxiety, and general health compared with the preoperative patients. The authors suggest that TMJ discectomy with dermis-fat grafting appears to have a positive oral health-related quality of life effect in terms of reducing pain and improving diet and mood in patients with significant TMJ internal derangement.