What's New in Dentistry

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Vital bleaching whitens tetracycline-stained teeth. Bleaching has become a popular procedure for lightening, brightening, and whitening dark teeth. Bleaching materials are even available as over-the-counter items for consumers. However, the most popular and perhaps most successful method of bleaching teeth involves a dentist's supervision and uses a nighttime bleaching tray with carbamide peroxide as the bleaching agent. This method of tooth-whitening usually is short-term (a few weeks) and reasonably successful in mildly stained teeth; it may require readministration of the bleaching agent with time. But what about subjects with tetracycline-stained teeth? Can deep stains in the enamel be ameliorated with nighttime bleaching with carbamide peroxide? A study published in the *Journal of Esthetic and Restorative Dentistry* (2003;15:142–153) evaluated the long-term effects of nightguard vital bleaching of tetracycline-stained teeth. The sample for this study consisted of 15 subjects with tetracycline-stained maxillary anterior teeth, who had participated in a protocol involving nighttime application of 10% carbamide peroxide in a bleach tray to their maxillary teeth. The bleaching agent was applied for six months; then, the success of the whitening process was measured against the original color of their teeth. These individuals were recalled after 90 months to assess whether whitening of the teeth was stable over time. Nine subjects reported no obvious shade change or only a slight darkening. None of the sample reported darkening of their teeth back to the original shade. The degree of improvement over the pretreatment shade was significant for the 90-month period. This study has shown that vital bleaching with 10% carbamide peroxide for six months can be a successful and stable method of lightening tetracycline-stained teeth.

Molar crown lengthening may produce furcation involvement. Occasionally, an adult may severely abrade or fracture a mandibular first or second molar. Today, repairing this problem could involve either extraction of the fractured tooth and replacement with an implant, or restoration of the fractured tooth. However, restoration of a fractured tooth could require periodontal crown lengthening in order to expose sufficient tooth structure for adequate retention and resistance form for the restoration. Which result is more predictable long-term? A study published in the *Journal of Periodontology* (2003;74:815–821) evaluated the long-term effects of crown lengthening of mandibular molars on the future periodontal health of those teeth. The sample consisted of 26 mandibular molars that required crown lengthening prior to prosthetic crown placement. A control sample consisted of 24 crowns on mandibular molars that had not undergone crown lengthening. Bitewing radiographs prior to surgery (experimental group) or placement of the crown (control group) and five years after completion of the prosthesis were compared. The results showed that 10 of the 26 experimental teeth (38%) were found to have radiographic evidence of furcation involvement after five years. However, none of the control teeth had furcation involvement after the same period of time. When deciding whether to restore a fractured tooth or replace it with an implant, the clinician must be aware that crown lengthening of the tooth could result in furcation involvement in the future, which could make the long-term prognosis for that tooth less successful than an implant.

Early loading of dental implants not detrimental to crestal bone. In recent years, researchers have gradually accelerated the time for implant restoration and loading. Previously, it was customary to wait for four to six months after implant placement to permit bone to integrate with the implant surface before restoring the implant and placing it into occlusal function. Today, immediate loading is often proposed for certain types of implant restorations. But what happens to the bone around the implant, especially at the crest of the alveolus, when the implant is loaded immediately after placement? A study published in the *Journal of Dental Research* (2003;82:585–591), compared the effects of early and delayed loading of dental implants on the crestal bone height in experimental animals. The sample consisted of three groups of pigs. Mandibular first premolars were extracted; two months later, implants were placed in these sites. An intraoral hydraulic device was used to apply a continuous load to the implant. The loading of the implant was begun at one, two or four months after placement of the implant. The researchers then evaluated the amount of bone loss at the crest of the alveolar ridge over time in each of the groups. The results showed that early loading of the implants preserved the most crestal bone. Delayed loading resulted in significantly more crestal bone loss compared with non-loaded controls. The histological assessment of the healing bone around the implants suggests that loading of osteoblasts exerts a synergistic effect, and supports the

hypothesis that early loading produces more favorable osseointegration.

Grafting of tooth sockets after extraction preserves ridges for future implants. Extraction of teeth typically leads to narrowing of the alveolar ridge. If an implant is planned for the edentulous site in the future, significant ridge narrowing could either compromise implant positioning or require surgical ridge augmentation prior to implant placement. This dilemma could occur in an orthodontic patient who is congenitally missing mandibular second premolars and has ankylosed primary second molars that require extraction. If implants will not be placed for several years, or until facial growth is complete, then the alveolar ridge could narrow significantly and require augmentation. However, a study published in the *Journal of Periodontology* (2003:74:990–999) evaluated the preservative effect of bone grafting at the time of tooth extraction on ridge narrowing with time. The sample consisted of 24 subjects with an average age of 51 years. All subjects required extraction of a permanent tooth and delayed implant placement. The subjects were randomly selected to receive either extraction alone or ridge preservation using freeze-dried bone allograft and a collagen membrane placed immediately after tooth extraction. At the time of implant placement, the ridge width was measured and compared between groups. The results of this study showed that both groups experienced some narrowing of the alveolar ridge with time. However, the group that received a bone graft had about 50% less ridge reduction than the nongrafted group. This study shows that bone grafting at the time of tooth extraction can be beneficial for a patient who will receive an implant in the edentulous site in the future.

Implants placed in periodontally infected sites are highly successful. Implants are commonly chosen to replace teeth that must be extracted because of significant periodontal disease. In order to avoid narrowing of the alveolar ridge, it is advantageous to place an implant at the time of tooth extraction. However, if the patient has active periodontal disease, and the tooth socket is infected with periodontal pathogens, then the infection could compromise the long-term success of the implant. In order to test this hypothesis, a study published in the *International Journal of Oral and Maxillofacial Implants* (2003;18:391–398) evaluated the percentage of bone-implant contact of immediate implants placed into periodontally infected alveoli in dogs. The sample consisted of five young adult male dogs. Periodontal disease was induced around specific teeth, which resulted in an increase of probing pocket depth and exposure of molar bifurcations. Control teeth were identified in the same animals. After three months, control and infected teeth were extracted and implants were placed in the alveoli. After 12 weeks of healing, the amount of bone-implant contact was compared between the control and infected sites. The results showed a mean bone-implant contact of 62% in the control group and 66% in the experimental group, a difference that was not statistically significant. This study concludes that periodontally infected sites are not a contraindication for immediate implant placement.