What's New in Dentistry

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Lack of posterior dental support not related to TMD. A common theory about TMD is that intracapsular symptoms can be exaggerated in patients who are missing their posterior teeth. It is presumed that the first and especially the second permanent molars help to share the masticatory load with the temporomandibular joint during function. Furthermore, if posterior teeth are missing, then the masticatory load on the condyle and fossa are increased, which could cause intracapsular pain in the temporomandibular joint. However, a study published in the Journal of Dental Research (2003;82:532-536) refutes this theory. In this investigation, the authors gathered a sample of adult males who had complete dentitions and no temporomandibular dysfunction. Then, a series of occlusal splints were constructed for each subject. The length of the occlusal splints varied, and either covered the teeth from second molar to second molar, first molar to first molar, second premolar to second premolar, or first premolar to first premolar. Then the subjects were asked to clench their teeth with maximum force while wearing each of the splints. The shortened splints would simulate shortened dental arches. This exercise was repeated several times in order to verify the data. The results of this experiment showed that as the length of the occlusal splint decreased, the biting force also decreased proportionally. In other words, shortened dental arches in the same individual produced reduced loading on the teeth and the temporomandibular joints. The authors believe that this natural reduction in bite force is mediated by the proprioceptive mechanism in the periodontal ligament of the functioning teeth, which acts as a defense mechanism to prevent overloading of the temporomandibular joint.

One-stage dental implants are highly predictable. When implants were re-introduced to dentistry in the early 1980's, the standard protocol for implant success involved a two-stage technique. The implants would be buried beneath the tissue for four to six months to insure osseointegration, and then a second surgical procedure was required to uncover the fixture in order to attach an abutment and crown to the implant. However, during the 1990's some clinicians began using one-stage implants, which protruded through the tissue after initial placement and, therefore did not require a second surgical procedure in order to restore the implant. The reduction in surgical procedures is a benefit to the patient, but does this approach jeopardize the long-term success of the implant. This question was addressed in a study that was published in the *International Journal of Oral and Maxillofacial Implants* (2003;18:399–405). The sample for this investigation consisted of a consecutive series of 674 one-stage implants that were placed in 308 subjects from 1993 to 2000. After the usual period of osseointegration, the implants were restored and placed into occlusal function. Then these patients were recalled several years later to assess the implant success rate. The number of successful one-stage implants was 654, so the success rate was 97%. This is similar if not better than the published success rates of two-stage implants. So, it seems that the use of one-stage implants especially in the posterior region of the mouth is an acceptable protocol in order to reduce the number of surgical procedures for the patient.

Occlusal appliances predictably reduce myofascial pain. Clinicians often recommend the use of occlusal splints to reduce temporomandibular pain. Many retrospective investigations have confirmed the utility of this approach in patients with myofascial pain. But today, evidence-based reporting requires prospective, randomized clinical trials to verify the success or failure of various clinical techniques. Are occlusal splints effective at reducing temporomandibular pain when subjected to this level of scientific scrutiny? This question was addressed in a study published in the Journal of Orofacial Pain (2003;17:133-139). The sample for this investigation consisted of 60 subjects who were selected from a larger group of over 950 individuals who had sought treatment for TMD at a large community dental facility in Scandinavia. These 60 participants had a diagnosis of myofascial pain, with no other temporomandibular symptoms. Then these individuals were randomly assigned to one of two groups. One group wore a traditional flat-plane occlusal splint, and the other group wore an appliance, which covered the palate with acrylic, but had no occlusal coverage. Both groups were asked to wear the appliances for 10 weeks. Then the presence or absence of myofascial pain was assessed in each group. The results of this experiment showed that pain was alleviated in 97% of the subjects who wore the splint with occlusal acrylic, and in 57% of the subjects with only the palatal acrylic. Although this study shows that even the appliance without occlusal acrylic produced partial success in reducing myofascial pain, the appliance with occlusal acrylic was the most predictable method of eliminating myofascial pain.

Subgingival chlorhexidine enhances regenerative

therapy. Regenerative techniques have gained popularity in the treatment of some patients with periodontal attachment loss. The use of membranes and/or bone grafts has revolutionized the way in which periodontal patients are currently treated. But occasionally a patient may not respond favorable to regenerative techniques because of recurrent bacterial infection, due to the patient's lack of adequate oral hygiene. In a study published in the Journal of Periodontology (2003;74:411-419), researchers tested the use of an antimicrobial (chlorhexidine) to reduce bacteria and enhance the healing process during regenerative therapy. The sample for this experiment consisted of 44 subjects who had more than one site with significant attachment loss. After routine root planning and scaling, the subjects were randomly assigned to one of two groups. Both groups received regenerative therapy including bone grafts and membranes. However, in one group, chlorhexidine chips were placed into the defect to help promote an antimicrobial effect during the healing process. In the other group, a sham chip was placed in a similar way. Then the attachment levels of all individuals were evaluated after one year. The results of this study show that the group receiving the chlorhexidine chips gained significantly more bone height than subjects receiving the sham chip. In conclusion, the use of antimicrobial chips is an effective method of reducing bacterial infection and enhancing the gain in attachment during regenerative periodontal therapy in humans.

Minocycline emersion enhances healing of replanted

avulsed teeth. If a trauma victim avulses a tooth, the success of replantation without ankylosis and/or root resorption typically depends on the amount of time that the tooth is "out of the socket." However, even if the tooth is replaced immediately after avulsion, replacement resorption of the root could still occur in some individuals. In order to reduce this destructive process, researchers have tested the application of various chemicals to the root surface prior to replantation. A study published in Dental Traumatology (2003;19:96-102), evaluates the topical application of minocycline, a tetracycline derivative, to the root surface of intentionally extracted teeth prior to replantation. The sample consisted of 32 roots in seven monkeys. The nerves in these roots were extirpated and the canals of these teeth were filled with gutta percha prior to intentional extraction. Then, the sample was divided into three groups. In the control group, the teeth were extracted and then replanted immediately. In the second group, the roots of the extracted teeth were allowed to dry for one hour before being replanted. In the third group, the roots were allowed to dry, and were then submersed in minocycline for five minutes before replantation. After 12 weeks, all teeth were evaluated histologically to determine the amount of replacement resorption that had occurred on the root surfaces. The results of this study showed that topical application of minocycline resulted in 34% complete healing of the root with no resorption compared to 16% for the non-minocycline control. So, this study shows that minocycline, if applied topically, provides increased resistance to replacement root resorption in replanted avulsed teeth.