Small diameter implants—clinical results with an advanced material

By Prof. Bilal Al-Nawas

Orofacial rehabilitation with reduced morbidity for the patient is an imperative for future research. The topic of providing such treatment options is of particular interest. There is no doubt that bone grafting procedures in aesthetically critical areas are often required to stabilize the soft tissues and allow for an adequate restoration. On the other hand, the value of augmentation procedures has to be questioned when it comes to immunocompromised patients or aesthetically uninvolved cases.

Only a few researchers have compared the complication rate of the whole augmentation process with the outcome of short or diameter reduced implants. While for short implants marginal bone stability in the long term period is important, the problem of diameter reduction lies in the higher possibility for implant fractures (technical complications). The use of grade IV commercially pure Titanium (cpTi) seems to limit the broad use of implants with <3.5 mm of diameter. Most implant manufacturers have well described indications for smaller implants (e.g. lateral incisors). Trust would allow manufacturers of more fracture resistant implants, but the classical Ti-Al-V alloys are lacking acceptable biocompatibility. In order to allow a wider use of narrow diameter implants, a new material—Rosebid—has been developed.

This implant material, which is a Ti alloy, increases the fracture resistance compared to cpTi. Data from animal models indicates at least a comparable osteointegration to cpTi. Fracture resistance due to ISO standard exceeds that of cpTi. The first randomized, double-blind study compared 3.3 Rosebid implants with 3.3 Roxolid implants in a split mouth study. The data show promising results for the new alloy.

Small diameter implants can be beneficial in cases of narrow bone ridges. Due to their reduced dimensions, bone grafting procedures should be avoided. However, long-term data on the rate of technical complications is needed. The first trials comparing small-diameter implants with augmentation procedures are ongoing and will help to learn more about this technique.

Prof. Bilal Al-Nawas’ lecture on “A New Era in Implant Dentistry—With Innovative Material and Surface Technology” will be held today in the Theatre on Level 3. The session starts at 8:30.

The main effect on individuals is the impact on quality of life

An Interview with Dr Fotinos S. Panagakos, USA, on the management of dentine hypersensitivity

Dr Fotinos S. Panagakos

Dentine is normally covered by enamel or cementum. Due to any number of factors, including abrasion, periodontal disease causing gingival recession or erosion, removing the enamel, the underlying dentine and dentine tubules can become exposed. An external stimulus, such as a change in external temperature, air movement or a physical stimulus can cause discomfort for the patient. The external stimulus is usually transitory and the discomfort subsides shortly after the stimulus is removed.

The accepted theory of how dentine hypersensitivity pain is transmitted suggests that pressure or ionic changes in the fluid that exists in the dentine tubules stimulates the pain experienced by the patient. This is often referred to as the hydodynamic theory. Inside the dentine tubule, a change in osmotic pressure causes fluid movement, which is transmitted as a stimulus to the odontoblastic process and fires the afferent nerve ending in the pulp.

How does this condition affect patients and the dentists who treat them?

The main effect on individuals is the impact on quality of life. Patients have to avoid certain foods and beverages that may trigger a painful response, thus reducing the type of foods and drinks they can enjoy. In the dental office, what is normally a routine visit may end up being a very uncomfortable appointment for a patient with dentine hypersensitivity. Simple procedures, such as scaling and a prophylaxis, may be painful. And, at times, the pain associated with dentine hypersensitivity may cause a patient to skip dental appointments all together.

The diagnosis of dentine hypersensitivity often poses a challenge for dental professionals because the cause and description of the pain reported by the patient can vary and is often not adequate to make a definitive diagnosis. Dental professionals often need to perform a thorough exam as well as additional tests to determine why the pain is occurring. The exam and test can help develop a definitive diagnosis that allows us to rule out other possible causes of the pain (periodontal disease, caries, etc) and then implement an appropriate treatment plan for addressing the problem.

Once the diagnosis is made, treating the problem can also be a challenge. Many products today do not work instantly or last for long, leaving applications or may take time, sometimes up to weeks, for an effect to be felt by the patient.

What are some of the ways that dentists can diagnose and treat dentine hypersensitivity today?

The treatment and prevention of dentine hypersensitivity, for many years, has focused on eliminating the ability of the causative agent to stimulate discomfort. This has resulted in the development of two major classes of products—agents that occlude dentine tubules and desensitizing agents that interfere with transmission of nerve impulses.

Occluding agents act by physically covering or ‘plugging’ the open, exposed dentinal tubules, thus preventing the effect of thermal changes or physical stimuli caused by the movement of dentinal fluid due to osmotic pressure changes. These agents can be applied professionally in the dental office or by the patient through the use of home care products.

The second approach recommended by dental professionals to help prevent and/or treat dentine hypersensitivity is through the use of OTC desensitizing agents. Desensitizing agents work by altering the levels of charged molecules in the dentinal tubule fluid. The most commonly used agent is potassium nitrates, usually delivered in a dentifrice that is applied twice daily by the patient during regular tooth brushing. The potassium ions enter the dentinal tubule fluid, reducing the excitation caused by the movement of fluid in the dentinal tubules, and blocking the transmission of the stimulus from the odontoblastic process to the nerve in the pulp chamber. Most products require continued use over a four to eight-week period before relief may be realised by the patient. In addition, the procedure often needs to be continued in order to maintain the relief afforded by the potassium nitrates.

What other treatment concepts are available if patients do not positively respond to either of these agents?

In this case, dental professionals may turn to covering the exposed dentinal tubules or indirect restorations. Finally, periodontal surgery, involving the grafting of gingival tissue to cover the exposed dentine may be performed.

Thank you very much for the interview.