Miniscrew covering: An alternative to prevent traumatic lesions

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During orthodontic treatment with miniscrews, complications such as aphthous ulceration, soft-tissue coverage of the miniscrew head, soft-tissue inflammation, infection, and peri-implantitis can occur. Good hygiene can prevent inflammation by infection but does not prevent traumatic oral mucosal lesions at the buccal mucosa. The purpose of this article was to describe the use of a physical barrier—a light-cured temporary filling material—to cover the miniscrew head and prevent soft-tissue trauma. (Am J Orthod Dentofacial Orthop 2012;141:242-4)

Ossaeous anchorage with dental implants was introduced in the 1980s; moreover, it was in 1997 that Kanomi introduced miniscrews, a variation of surgical fixation screws. Miniscrews can be placed in various alveolar bone locations, and numerous applications have been presented in literature. Nevertheless, complications can arise during miniscrew placement, such as trauma to the periodontal ligament, dental root, or nerves, nasal and maxillary sinus perforation, and subcutaneous air emphysema. Complications during orthodontic loading such as aphthous ulceration, soft-tissue coverage of the miniscrew head, soft-tissue inflammation, infection, and peri-implantitis can also occur. Traumatic lesions to soft tissues do not appear to be a direct risk factor for miniscrew stability, but their presence might predict greater soft-tissue inflammation. The placement of a healing abutment, a wax pellet, or a large elastic separator over the miniscrew head, with daily use of chlorhexidine (0.12%, 10 mL), typically prevents ulceration and improves patient comfort. COVERING THE MINISCREW HEAD TO PREVENT SOFT-TISSUE DAMAGE IS NOT A CURRENT PROCEDURE IN ORTHODONTICS; THEREFORE, THE AIM OF THIS ARTICLE WAS TO PRESENT THE ALTERNATIVE USE OF A DENTAL MATERIAL FOR THIS PURPOSE.

CASE REPORT

After miniscrew placement, the soft tissues can be damaged by friction. The patient in Figure 1 had a mini-implant placed between the central incisors. Within 48 hours, an ulceration appeared in the frenulum (Fig 1, A), despite an elastic chain on the miniscrew head. Resin was placed over the miniscrew head, and, after 4 days, the tissue was healthy (Fig 1, B).

An alternative covering material and application technique—a light-cured temporary filling material, Bioplic (Biodinâmica, Ibiporã, Paraná, Brazil)—has been used for years in the orthodontic department at the Federal University of Rio de Janeiro in Brazil to cover miniscrew heads and prevent patient discomfort. This material has a viscous and elastic consistency after polymerization, allowing easy placement and removal. Some clinicians use composite resin to cover the mini-screw head, but burs are required to remove the resin.

The placement technique is simple and fast. Relative isolation is required, and it is necessary to dry the mini-screw head. Use a tooth sculpture tool (or a similar instrument), to shape the filling material and then light-cure it for 40 seconds (Fig 2). The material is easily removed with a probe (Fig 3).

Other temporary filling materials are available and can be used to cover a miniscrew head. They should be light-polymerized and remain semiflexible after polymerization.

DISCUSSION

The aims of orthodontic treatment described by Tweed (1966) are to achieve the best balance and harmony of facial lines, stability of dentures after treatment, healthy mouth tissues, and an efficient chewing mechanism. Because the surrounding tissues...
must be kept healthy, the placement of miniscrews should be carefully performed to prevent damage to nerves, vessels, teeth, and other structures. In some cases, extra care is also required after placement to avoid soft-tissue trauma. A dental material manufactured for another purpose, a temporary light-polymerized resin, can be used to cover the miniscrew head and prevent soft-tissue trauma. The use of a light-cured filing material to cover an implant promotes its direct contact with oral soft tissues; the use of any dental material should be avoided if the patient is sensitive to any components of the formula, such as the acrylate groups.

**Fig 1.** A, Traumatic lesion in the frenulum caused by a miniscrew; B, after placement of a resin covering the head of the miniscrew, the tissue healed in 4 days.

**Fig 2.** Placement technique: A, dry the miniscrew head; B and C, adapt the material; D, light cure (40 seconds).

**Fig 3.** Removal technique: A, insert a probe at the junction between the material and the implant; B, the material is unfixed.
which can cause hypersensitivity reactions. Cell-culture studies have demonstrated that composite resin components elicit significant toxicity in direct contact with fibroblasts.4 The monomer released by resins can induce local and systemic reactions in patients,5 causing epithelial proliferation, liquenoid reactions,6 hypersensitivity and allergic reactions.6-8 Nevertheless, when using the light-polymerized temporary filling Bioplic to cover the miniscrew heads in patients at the Federal University of Rio de Janeiro, we observed no sensitivity or allergic reactions.

The biocompatibility of dental materials is as important as their clinical performance and physical and mechanical properties. Thus, it is suggested that cytotoxicity and biocompatibility studies of temporary light-polymerized temporary fillings should be conducted.

CONCLUSIONS

Miniscrew covering is an easy method to prevent soft-tissue trauma and requires a simple procedure. Studies evaluating the performance, cytotoxicity, and biocompatibility of light-polymerized temporary fillings are suggested.

REFERENCES