Expectations, acceptance, and preferences regarding microimplant treatment in orthodontic patients: A randomized controlled trial

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Introduction: In this study, we evaluated the pain and discomfort experienced by orthodontic patients by comparing how they rated the pain associated with microimplant placement, tooth extraction, and gingival tissue removal in preparation for implant placement.

Methods: Fifty-six microimplants were placed in 28 consecutive orthodontic patients for anchorage reinforcement in the maxilla for en-masse retraction. For all patients, extractions of maxillary, or maxillary and mandibular, premolars had been planned. The recruited patients were randomized into 2 groups according to the timing of the extractions. In group A, at least 1 extraction was performed during the evaluation period; the extractions in group B were after the evaluations. Furthermore, all patients had 2 different surgical procedures for placement. On 1 side, the gingival tissue was removed before placement. On the contralateral side, the implant was placed transgingivally. Each patient’s perception of pain and discomfort was evaluated by a questionnaire before, immediately after, and 1 week after the intervention.

Results: The discomfort experienced during the extractions was described as very painful by 50% of the patients. It was significantly greater than during tissue removal and microimplant placement ($P < 0.05$). Microimplant placement produced no pain in 30% of the patients and was described as the least painful procedure ($P < 0.05$). Transgingival microimplant placement was significantly preferred by all patients ($P < 0.05$).

Conclusions: Microimplant surgery seems to be a well-accepted treatment option in orthodontic patients, with significantly lower pain levels than for tooth extractions. Furthermore, transgingival placement is clearly favored by patients who do not need tissue removed before placement.

Read the full text online at: www.ajodo.org, pages 250.e1-250.e10.

EDITOR’S COMMENT

Microimplants (also known as miniscrews, temporary anchorage devices, and skeletal anchorage) have become part of mainstream orthodontics, allowing tooth movements that were either too difficult to achieve or too time-consuming just a few years ago. Most of us place microimplants in our offices and find the procedure easy and quick, with seemingly little discomfort to our patients. However, our patients’ point of view had, until recently, scarcely been documented. This study fills this gap by examining microimplant placement from the patients’ side. Questionnaires, with the well-known numerical rating scale scoring system, were used to collect data and compare patient discomfort during and after microimplant placement. Two techniques were used in a randomized split-mouth design: on 1 side, the implant was screwed directly through the gingiva; on the other side, the gingival tissue at the placement site was first removed with a gingival punch. Both procedures were compared with first premolar extractions, which took place either before or after microimplant placement.

According to the patients, transgingival placement caused the least discomfort, and they described it mainly as pressure rather than pain. The study followed the established guidelines of randomized clinical trials, avoiding bias as much as possible, and provides evidence-based information that can be used for technique selection and patient education.

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Q & A

Halazonetis: Considering the discomfort that a gingival punch was found to cause, it seems that it should be avoided. However, does it have some advantages? Or do you propose its complete abolishment?

Baxmann: The soft-tissue punch technique was basically designed to reduce the risk of peri-implantitis and to create or preserve the papilla between teeth and prosthetic implants. Furthermore, it was thought to give the clinician a less-invasive method when flap surgery was the only alternative. Because the transgingival placement method is successful, it is an even less-invasive technique for microimplant placement. From the patients’ point of view, this technique is clearly favored. Many case reports and studies also show that this is the clinicians’ favored technique. But there are 2 more factors to be considered. Is one of these 2 placement techniques more prone to lack implant stability and hence result in failure? We have addressed this question, and the results will be ready for publishing soon. The other question is: do the results of our study also apply to palatally placed microimplants? The main difference between these 2 typical placement areas is the soft-tissue thickness. To explore this further, a study to investigate transgingival placement and the punch technique in terms of patient discomfort and implant stability in palatally placed microimplants is in the planning process. We hope to provide an answer to this question soon.

Halazonetis: Are you following up on these microimplants to study short- and long-term success?

Baxmann: Yes, we are now analyzing the follow-up. As mentioned above, we have already performed a study addressing this question that will be ready to be published soon.

Halazonetis: On what percentage of patients are you using microimplants? Is this increasing or has it reached a plateau?

Baxmann: It has definitely reached a plateau. The first enthusiastic viewpoint that we could achieve anything in orthodontics by only using microimplants has become more realistic and pragmatic. But, nevertheless, microimplants are definitely a favored anchorage source for maximum anchorage especially in patients with asymmetric situations and when molar distalization is required.

Halazonetis: Randomized clinical trials are considered difficult to conduct. What were the major problems you faced in this research?

Baxmann: This study was performed in a private orthodontic practice. The idea was to avoid the typical critiques of research performed in a university or hospital environment: that the patients were preselected and not comparable with typical everyday orthodontic patients. But we thought that it was unusual for the patients to take part in study performed in a practice. Therefore, the main problems were (1) to recruit enough patients to gain useful statistical data and (2) to keep the patients content to achieve a minimal dropout rate without causing bias.