

Joint scientific research by Dr. Samer Tarif Jaber in the Curious Magazine for Medical Sciences

Research Title:

Effectiveness of Flapless Cortico-Alveolar Perforations Using Mechanical Drills Versus Traditional Corticotomy on the Retraction of Maxillary Canines in Class II Division 1 Malocclusion: A Three-Arm Randomized Controlled Clinical Trial

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Abstract

Background and objectives: Both invasive and minimally invasive surgical methods have recently gained popularity in accelerating orthodontic tooth movement. Traditional corticotomy (TC) was one of the first effective invasive surgical techniques in shortening orthodontic treatment time, whereas the flapless cortico-alveolar perforations (FCAPs) technique is a modern minimally invasive method that has recently shown good results in different types of orthodontic tooth movement. Therefore, this study aimed to compare the effectiveness of TC versus FCAPs in maxillary canine retraction when treating Class II division 1 malocclusion patients.

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Materials and methods: This was a single-blinded, single-center, three-arm randomized controlled trial. A total of 51 patients (22 males, 29 females, mean age 20.98 ± 1.95) whose treatment planning included the extraction of maxillary first premolars were enrolled and randomly divided into three groups: the TC group, the FCAPs group, and the control group. The assessed outcomes were the amount of canine retraction, anchorage loss, and canines' rotation, which was evaluated at five-time points till the completion of canine retraction.

Results: There were statistically significant differences in the amount of canine retraction between the three groups in the first two months ($p < 0.001$), with greater mean values in the TC group ($p < 0.001$) in the first month. However, the amount of canine retraction in the FCAPs group was significantly greater in the second month compared to the TC group ($p = 0.003$) and the control group ($p < 0.001$). In the first month of canine retraction, anchorage loss, and canine rotation were significantly lesser in the TC and FCAPs groups than in the control group ($p < 0.001$). On the contrary, the canines' rotation amount after the completion of retraction was greater in the TC group than in the other two groups ($p < 0.001$).

Conclusion: TC and FCAPs are efficient adjunctive surgical methods for accelerating canine retraction. At the end of the first month, the TC accelerated canine retraction by 59.85% and FCAPs by 44% compared to the conventional retraction. At the end of the second month, the acceleration was less than recorded in the first month (35.44% and 50.20%, respectively). The acceleration effect of the surgical interventions appeared transient and did not last in the following observation period.

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