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Research Title:

Treatment effectiveness of young adults using clear aligners versus buccal fixed appliances in class I malocclusion with first premolar extraction using the ABO-Objective Grading System: A randomized controlled clinical trial

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Abstract:

Objective: To compare the effectiveness of the clear aligners with the traditional fixed appliances in the treatment of premolars extraction complex cases using the American Board of Orthodontics Objective Grading System (ABO-OGS).

Material and methods: A single-center, 2-parallel groups RCT with two arms. Forty severe crowding patients (14 males, 26 females; mean age: 21.40± 2.42) who required four first premolars extraction were included and randomly allocated into two treatment groups: clear aligners therapy group (CAT), and fixed appliances therapy group (FAT). Cases complexities were measured on pre-treatment records using the Discrepancy index (DI). Post-treatment records were evaluated using the American Board of Orthodontics Objective Grading System (ABO-OGS). Two sample t-tests and Fisher's Exact tests were used to test for significant differences between the two groups. The statistical significance was set at $P < 0.006$ using Bonferroni's correction.

Results: For the DI, the mean scores were 32.25 (±4.33) in the CAT group and 33 (±7.92) in the FAT group. In the CAT group, the total OGS score ranged between 6–33 points with an average of 17.50(±7.41), whereas the total score in the FAT group went between 4– 30 points with an average of 12.89 (±6.31) with no significant differences between the two groups (P = 0.05). When comparison of the successful cases between the two groups was made, 11 cases received passing scores, and 9 cases received failing scores in the CAT group. Whereas in the FAT group, 17 cases received passing scores, and 3 received a failing score. No statistically significant differences were found in the passing rates between of the CAT and FAT groups (P=0.421).

Conclusions: According to the ABO-OGS total scores, there was no significant difference between the clear aligners and fixed appliances in the treatment of class I severe crowding cases with first premolars extraction in young adults. There were no differences between the two techniques in the OGS components scores except for the occlusal contacts, which were significantly better with the fixed appliances. When comparing the number of successful and failed cases between the two groups, no significant differences were noted, with the fixed appliances having a 30% higher success rate than the clear aligners, which must be considered clinically when choosing between these two techniques in the complex orthodontic cases treatment.

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