Stability of anterior open-bite treatment with occlusal adjustment

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Introduction: In this study, we aimed to evaluate the long-term stability of anterior open-bite treatment with occlusal adjustment and the dentinal sensitivity caused by this procedure in the long term.

Methods: The sample comprised 17 open-bite patients who experienced relapse of the negative vertical overbite after orthodontic treatment and were retreated with occlusal adjustment. The cephalometric changes were evaluated on lateral cephalograms obtained before and after the occlusal adjustment and in the long term (mean, 3.4 years after occlusal adjustment). Densental sensitivity was also evaluated before the occlusal adjustment, and 1.35 months, 4.61 months, and 3.4 years later. The cephalometric statuses between the 3 evaluations were compared with analysis of variance (ANOVA) and Tukey tests. The percentages of clinically significant relapse were calculated. To compare dentinal sensitivity at the several stages, nonparametric Friedman and Wilcoxon tests were performed.

Results: Statistically significant relapse of anterior open bite occurred in 33.3% of the patients. Those who had the procedure before 21 years of age were most likely to experience relapse. Densental sensitivity remained within the normal range in the long term.

Conclusions: Despite the statistically significant relapse of anterior open bite, clinically significant stability was found in 66.7% of the patients.


EDITOR’S COMMENT

An open-bite malocclusion in the permanent dentition can be difficult to correct, and patients often have significant relapse after treatment. What do you do when an adult patient returns 4 years later with mild relapse? Do you propose the fixed-appliance approach again, do you schedule a surgical consultation, or do you look for an alternative approach, such as occlusal equilibration? Let’s say you recommend the occlusal adjustment and the patient asks, “What are the chances that this process will be successful and my teeth will still fit together a year from now?” Do you know?

This report presents long-term data from a study that initially included 20 patients who experienced mild relapse 4 years or more after treatment for closure of anterior open bite. The first article reporting data from this study was published online in July 2008 (Janson G, Crepaldi MV, Freitas KMS, Freitas MR, Janson W. Evaluation of anterior open-bite treatment with occlusal adjustment. Am J Orthod Dentofacial Orthop 2008;134:10.e1-9). In that study, all the patients were retreated with occlusal adjustment until a positive overbite was established. At the time, these researchers planned to follow them in the long term to evaluate the success of this approach. Three years later, 17 of the same patients returned for additional posttreatment evaluation. A sample of this size can be considered satisfactory because of the unusual procedure used to correct the open bite.

What did these Brazilian clinicians see when they examined the same patients in the long term? First, they noted “clinically significant” stability in 66.7% of the patients treated with occlusal adjustment, and the dental sensitivity remained within the normal range. They found a statistically significant relapse of anterior open bite in the entire sample. Growth seemed to have contributed to a significant amount of the relapse. The primary factor contributing to the relapse was the increase in posterior molar height, consequent to compensatory posterior tooth eruption. It seems to me that these researchers believe that open-bite malocclusions are destined to relapse in many patients. An interesting approach would be to associate the procedures to reduce the clinically significant relapse. For example, nonextraction and extraction orthodontic treatments have 38.1% and 25.8% of clinically significant relapses, respectively. If these relapsed patients can be retreated with occlusal adjustment, and, knowing that this procedure has a clinically significant relapse rate of 33.3%, after the 2 procedures, the amount of clinically significant relapse would be significantly reduced. For now, we can only look forward to additional studies with larger sample sizes.
Q & A

**Turpin:** Who initially tried this occlusal adjustment procedure for closure of open bites in your clinic?

**Janson:** An author, Waldyr Janson, who is a prosthodontist, successfully treated some open-bite patients in the prosthodontic clinic at Bauru Dental School and in his private practice, obtaining a positive overbite and significant clinical improvement. I also used it clinically and observed that it aided in obtaining an adequate overbite during the finishing procedures in open-bite patients.

**Turpin:** Was dentinal sensitivity a short-term problem for any patient? Did age make a difference regarding sensitivity?

**Janson:** As shown in the first study, some patients had increased dentinal sensitivity for mastication, heat, and percussion during the first months, but it decreased to normal levels after 4.6 months. Younger patients tended to have greater sensitivity than older patients.

**Turpin:** Do you plan to study any other methods of controlling open-bite relapse?

**Janson:** We are thinking of using a cemented appliance with sharp spurs to change anterior tongue-rest posture, as recommended by Justus, and evaluating its effect on long-term stability. We are also using, as retention in treated open-bite patients, a modified Hawley plate with posterior bite blocks and tongue cribs. We intend to evaluate its effect on stability in the long term.

**Turpin:** Can compensatory posterior tooth eruption actually contribute to open-bite relapse in patients treated with occlusal adjustment?

**Janson:** This seems to be a possible significant factor contributing to open-bite relapse. This explanation is similar to that of Dr Kokich for open-bite relapse in patients treated with posterior tooth intrusion by miniplates in his presentation at the AAO Annual Session in Denver in 2008. Anterior face height is decreased, and the mandible experiences counterclockwise rotation with the procedure. However, tongue volume, muscle length, and masticatory force are unchanged. Therefore, the posterior teeth will erupt up to a point where the original balance between the eruptive and masticatory forces are reestablished.

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**Fig 1.** Intraoral photographs taken before the occlusal adjustment show the anterior open bite.

**Fig 2.** Intraoral photographs taken after the occlusal adjustment show correction of the anterior open bite, with a positive overbite.

**Fig 3.** Intraoral photographs taken in the long term after the occlusal adjustment show clinical stability of the open-bite correction with the occlusal adjustment. However, a slight reduction in the overbite is obvious.