

**PREFORMED POSITIONER WEAR VS. CUSTOM POSITIONER WEAR**

The results of preformed positioner wear were compared to that of the custom made positioner over a similar experimental period of 2½ months' duration. The same directions were given both groups of patients except the preformed group was given the positioner the same day the active appliances were removed. The custom made positioner group was given the positioner an average of 23 days following band removal during which time the impressions were sent to a commercial laboratory where it was fabricated according to a prescription for each individual. These custom positioners were set up ideally in an end-to-end anterior overbite relation, perfect Class I molar relation and articulated in accordance with a lateral cephalometric tracing of the mandible and temporomandibular joints. There were no statistical differences in the following measurements between the preformed positioner and the custom made positioner:

- a. Arch width - maxillary first permanent molars.
- b. Arch width - mandibular first permanent molars.
- c. Arch width - maxillary permanent canines.
- d. Arch width - mandibular permanent canines.
- e. Midline discrepancy correction.
- f. Closure of interdental spaces including those of extraction cases studied separately.
- g. Correction of individual tooth rotations, although the preformed positioner mildly excelled in correcting rotations.
- h. Reduction of gingival hypertrophy and swelling.
- i. Improvement of molar relationship anteroposteriorly.
- h. Improvement of the bucco-lingual maxillo-mandibular posterior relationship.

Significant differences were noted in the analysis of the following data:

- a. Vertical overbite - the preformed positioner excelled in its retention from band removal to the end of the retention period.

- b. Horizontal overjet - the preformed positioner excelled in the improvement of overjet from band removal to the end of the retention period.
- c. Settling of the occlusion - the preformed positioner excelled in allowing the teeth to interdigitate from over depression following active treatment during the time of positioner wear.

There is no difference in the overbite between the two groups at the end of active orthodontic treatment, however, there is a significant difference at the end of positioner wear. The mean overbite as the result of custom positioner wear and the interim waiting period prior to its use is more than twice that of the preformed positioner - 2.7 mm. vs. 1.3 mm.. The total relapse as the result of the custom positioner technique is 62½% of the total correction, which is 54.8% of the original. In other words, of an average 3½ mm. correction of a mean initial overbite of 4 mm., only .8 mm. remains at the end of the period of the custom positioner retention. The custom positioner technique had a total 14.7% total relapse, or over 3.7 times as effective in retaining the vertical overbite for a period of approximately 2½ months. The major difference between the two techniques is due to the fact that the preformed positioner is immediate and allows little relapse to occur within the first few weeks following band removal, since there was an insignificant difference between the two techniques when the actual times of positioner wear were compared, although almost twice the overbite relapse occurs during the actual use of custom positioners as compared to the preformed positioner (1.1 mm. vs. 0.6 mm. relapse). The insignificant statistical comparison falls short of the 5% level of confidence. When the total retention periods are compared, however, the difference is substantial, indicating that the relapse of both the interim waiting period following band removal and that experienced during the use of the custom positioner is significantly greater than that of the preformed positioner. The fact that the latter is inserted immediately upon band removal together with the principle of anterior depressive action on the incisal area accounts for the difference.

A further analysis on a sample of finished cases during a one, two and three week period following appliance removal where no retention was used indicated that 81% of the total overbite relapse during a two week interim period without retention occurs

during the first seven days, or 19% relapse of the total correction while 19% occurs during the remaining seven days (or 5% of the total correction). From the 14th to the 23rd day, an additional 8% relapse occurs with a total 31% within a three week period. It is, therefore, suggested that the first week following the removal of the active appliance is extremely critical in the proper retention of vertical overbite regardless of the technique used.

Similar results exist for overjet correction without retention in that 82% of the overjet relapse during the first two weeks after appliance removal occurs during the first seven days while only 18% occurs during the last seven days. This represents 23% of the total correction. When the retention results of the performed positioner were compared to that of the custom positioner, there was a significant difference between the two positioner techniques. The custom positioner technique produces a 31% relapse (during the waiting period of the mean 3.6 mm. improvement of the initial overjet of 4.9 mm.) and then improves 5.2% while the positioner is being worn. The resultant overjet at the end of the retention period has a total significant relapse of 25.8% of the original correction. The preformed positioner, on the other hand, improves at band removal 19.8%.

The effectiveness of the preformed positioner was compared to the Hawley retainer in combination with a fixed canine-to-canine mandibular retainer for overbite and overjet retention. The preformed positioner was almost twice as effective as the Hawley retainer in retaining overbite with a moderately significant difference between the two techniques. The preformed positioner allowed an average overbite relapse of 0.6 mm. while the Hawley retained allowed 1.03 mm.. Mention should be made that the insertion of the Hawley and records were taken an average of 4 days after the removal of all active treatment appliances so that it is probably that an unrecorded portion of the relapse had already occurred.

When comparing the effectiveness of the custom positioner to that of the Hawley retainer, it was found that the two were identical (1.06 mm. overbite relapse with the custom positioner, 1.03 mm. relapse with the Hawley retainer). If one includes the waiting period of the custom positioner immediately following the removal of the active treatment appliances until the time of insertion, a significant difference in effectiveness

of overbite retention becomes evident. The custom positioner allows 2.19 mm. relapse while the Hawley retainer allowed 1.03 mm. relapse when including the waiting period.

The ability of the preformed positioner to retain horizontal overjet is significantly more effective than the Hawley retainer since it improves overjet a mean 0.77 mm. while the Hawley allows a relapse of 0.97 mm.. There is also a significant difference in the custom positioner's ability to retain overjet over that of the Hawley retainer. However, when the custom positioner fabrication waiting period is included, its effectiveness drops to that of the Hawley retainer.

As a result of this investigation, it was found that the preformed positioner was significantly more effective in retaining overbite and overjet than both the Hawley retainer and custom positioner. It was also concluded that most drastic relapse tendencies occur within the first seven days following band removal of orthodontic appliances.