

Target protrusive position from mandibular protrusion titration: is it a good estimate of adequate protrusion? Does it correlate with RDI or BMI?

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Introduction

We have developed a mandibular protrusion titration test (MATRx, Zephyr Sleep Technologies) that is intended to select patients with obstructive sleep apnea (OSA) for oral appliance therapy. In this test, the mandible is progressively protruded by a remotely controlled mandibular positioner during polysomnographically (PSG) monitored sleep. The therapeutic dentist fits the patient with chair-side custom fitted trays and determines the range of mandibular motion which is conveyed to the sleep laboratory. A qualified physician interprets test, predicts therapeutic outcome of oral appliance therapy, and provides the dentist a target therapeutic protrusive distance required to eliminate sleep apnea. We report in a separate presentation (APSS, 2012) the results of a prospective, predictive clinical trial which shows that the test has excellent positive predictive power. Thus, the mandibular protrusion titration test appears to have predictive accuracy that is adequate for selecting patients for oral appliance therapy. The present study tests the hypothesis that this target therapeutic, provided by the test, position agrees with the actual position that provided therapeutic success.

Methods

Patients (n=58) having a broad range of (20.9-30.1) and RDI (10.8-56.3) values underwent mandibular protrusive titration in a PSG setting. They then received a custom mandibular protruder (SomnoDent[®], SomnoMed) set at the target position. Both the interpreting physician and the therapeutic dentist were appropriately blinded. After the test, the dentist was provided the target position determined in the test for patients predicted to be therapeutic successes or a sham value (70% of full protrusion) for those predicted to fail oral appliance therapy. Baseline and therapeutic outcome RDI were determined by a home respiratory evaluation during sleep using validated portable monitor (Snoresat[™], SagaTech), and therapeutic success was defined as a value less than 10 hr⁻¹. Patients who were not therapeutic successes at target position received additional protrusion of their appliance and were retested in a final position, after full clinical adjustment.

Results

In 30 of the patients, mandibular protrusion satisfied the prospectively established criterion for predicting therapeutic success, i.e., $AHI \leq 12 \text{ hr}^{-1}$ during REM sleep in the supine posture. Of these 28 (93%) displayed therapeutic success at the target protrusive position, which averaged 65.9% of full protrusion. The two therapeutic failures became successes after additional protrusion (21% and 31%), and the final group mean protrusive position was 67.8%. We evaluated other variables that might predict a therapeutically successful position, and correlated RDI and BMI with final, successful protrusive position. Neither variable correlated significantly with the therapeutically successful position ($r^2 = .0035$ and $.00006$, respectively).

Conclusion

In addition to accurately identifying OSA patients who will be successfully treated with an oral appliance, the mandibular protrusion titration test provides a therapeutically adequate target position in almost all patients.

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