

Individualized Optimization of Mandibular Advancement Devices in Obstructive Sleep Apnea: A Clinical Outcome Analysis

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Introduction:

The mandibular advancement device (MAD) is an established OSA treatment, typically titrated subjectively based on patient symptoms such as snoring or daytime sleepiness. However, subjective improvement may lead to premature titration termination. This study evaluates whether objective titration via polygraphy can improve treatment outcomes.

Methods:

All patients started MAD therapy for three months (ProSomnus MAD EVO Device) as a first-line treatment option. The MAD was fitted in the maximum comfortable protrusion minus 3 millimeters. Titration was guided based on subjective relief of cardinal symptoms. The efficacy of the therapy in terms of reduction in OSA severity was evaluated by polysomnography (PSG). Response was defined as AHI with MAD < 10 events/hour. In non-responders (AHI with MAD > 10 events/hour), additional titration under polygraphic guidance (MediByte) was performed. Differences in respiratory parameters (AHI, oxygen desaturation index (ODI) and sleep apnea specific hypoxic burden (SASHB)) between responders and non-responders were evaluated.

Results:

86 patients completed the study of which 73 patients could be considered responder based on subjective titration solely, while 13 patients (male: 100%; age: 55±11 years; BMI: 28.0±4.4 kg/m²) needed additional titration based on AHI > 10/h on PSG.

In the responder group, AHI, ODI and SASHB improved significantly under MAD therapy. In the non-responders who needed additional titration, the respiratory parameters AHI, ODI and SASHB improved following optimization. AHI, ODI, and SASHB were significantly higher at baseline ($p < 0.05$) and after subjective titration ($p < 0.05$) in the non-responders vs responders, but became comparable after optimization.

Conclusion:

Our findings indicate that subjective titration may not be sufficient for guiding MAD therapy. Further objective optimization can result in improved MAD treatment outcomes.