

ORAL APPLIANCE THERAPY

for snoring and obstructive sleep apnoea

Based on recently updated guidelines from the American Academy of Sleep Medicine, oral appliances are now regarded as a first-line therapy for patients with snoring and mild to moderate obstructive sleep apnoea (OSA).¹ While CPAP (Continuous Positive Airway Pressure) is regarded as the gold standard treatment for people with severe OSA, oral appliance therapy is indicated for patients who cannot tolerate its use or are only using it sporadically.

Dentists have an important role to play in the treatment of these conditions, with oral appliances being validated for efficacy, safety, and comfort, by high level scientific studies over the last 10 years. This article provides an outline of aspects of dental sleep medicine based on several recent, important studies.

EFFECTIVENESS AND PREDICTING SUCCESS

Oral appliance therapy is an effective therapy with studies demonstrating over 80% success in treating mild to moderate OSA² and over 90% success for managing snoring.³

Currently there is no test which can predict the possibility of successful outcomes of oral appliance therapy, with a high degree of accuracy, for an individual patient. A method of analyses using clinical, polysomnographic, and cephalometric variables has recently been published, providing an 80% correct classification of responders and non-responders to oral appliance therapy.⁴ The outcome of oral appliance therapy was especially favourable in less obese patients with milder obstructive sleep apnoea/hypopnea syndrome, more extended maximum mandibular advancement, and with certain craniofacial characteristics (mandibular retrognathism, in particular).

THE IDEAL MANDIBULAR ADVANCEMENT APPLIANCE

Currently there is no data that compares the effectiveness of the different designs of adjustable mandibular advancement appliances. In his recent review article, Dr Ama Johal identifies the criteria of current, "gold standard", third generation, mandibular advancement appliances.⁵

The criteria are:

- Permits incremental advancement which is self adjustable by the patient. Several other studies cite ease of titration by the patient as a key factor in achieving successful outcomes.
- Maintains minimal vertical opening. The appliance should not promote mandibular opening, as downward and backward rotation of the mandible can lead to further narrowing of the pharyngeal airway, thus negating any benefits from protrusion. The importance and rationale of limiting mandibular opening has been discussed in other articles.⁶
- Allows for lateral movement of the mandible.

There are currently 16 appliances which have United States FDA approval for not just snoring, but also sleep apnoea. Each of the following nine appliances has studies published in refereed journals, and has FDA approval for both snoring and sleep apnoea. The following appliances have been rated using Dr Johal's criteria for a "gold standard" third generation mandibular advancement appliance:

Mandibular advancement appliance	Self adjustable	Maintains vertical dimension	Lateral movements	Total score
MDSA Medical Dental Sleep Appliance	3	3	3	9
TAP 3 Thornton Anterior Positioner	3	3	3	9
PM Positioner	3	3	1	7
EMA	2	2	3	7
Klearway	3	3	1	7
Somnomed MAS	3	1	1	5
Silent Night	0	3	2	5
OASYS	1	3	1	5
Herbst	0	3	1	4
Scoring 3 = Excellent	2 = Good	1 = Poor	0 = Not Possible	

SIDE EFFECTS OF MANDIBULAR ADVANCEMENT APPLIANCES

In Dr Johal's review article, side effects are described as common, yet transient, and tend to resolve with regular use. This includes discomfort in the muscles of mastication, excessive saliva, dry mouth, and abnormalities of the bite on awakening. Temporomandibular joint discomfort has been reported in one study as having occurred in three out of 24 patients, usually resolving when the appliance is withdrawn for a period and the titration period extended. While occlusal or bite changes can occur with long term use, the author states that the literature is conclusive in reporting that appliance wear does not produce changes in the cranio-facial skeleton or temporomandibular joint.

OCCUSAL CHANGES

Based on Dr Chris Pantin's study in which 106 patients were followed over five years, it had been generally accepted that occlusal changes occur in around 15% of patients who wear a mandibular advancement splint.⁷ A recent, high level study using time lapse, 3D imaging techniques demonstrated some degree of occlusal changes occurring in more than 30% of patients.⁸ These changes are mostly minor, not affecting function or aesthetics, with many patients not aware of its occurrence. Recent evidence was presented which indicates that occlusal changes which occur within the first 12-18 months can reverse if the patient ceases using the appliance.⁹ The vast majority of patients are not concerned about the occurrence of occlusal changes and want to continue to use their appliance because of the significant benefits gained. These benefits often include refreshing sleep, reduced sleepiness with greater energy during the day, enhanced mood and reduced risk of motor vehicle and workplace accidents. There are also significant health benefits, with reduced risk of hypertension, stroke and heart disease. Regular 12 month reviews are important in order to identify and deal with the possibility of occlusal changes.

While maintaining an optimal occlusion is generally an important goal within the practice of dentistry, it is recognised by dentists in the field that, for the vast majority of patients, the benefits of oral appliance therapy far outweigh the side effects represented by the possibility of occlusal changes.

REFERENCES

References supplied by the author are available on request by contacting newsbull@ada.org.au.

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