Providing options

Neel Kothari discusses how clinicians can provide options for patients to reduce the impact from snoring

Mandibular advancement splints (MAS)

Mandibular Advancement Splints (MAS) are appliances which posture the lower jaw forwards in order to assist in opening the patient’s airway. This maintains the patency of the airway by replicating the effects of a mandibular jaw thrust and holds the jaw in the recovery position. As discussed in the first part of the series, during sleep the tongue drops back, the muscles below the jaw relax, which causes the soft tissues to audibly vibrate, giving rise to the snoring sound. The snorer has to work extra hard to overcome the air resistance, often depriving the individual of oxygen.

Many of the earlier mandibular advancement splints made using thermoplastic materials suffered with issues relating to retention, comfort, compliance and long term viability. As such, the use of rigid ‘custom-made’ materials is now regarded to have a more positive outcome for the patient. A recent study comparing an acrylic custom-made and a thermoplastic proprietary intra oral appliance for the treatment of mild sleep apnoea (Vandervenken OM et al Am J Respir Crit Care Med, 2008) found the acrylic custom-made appliance to be more effective, but with this also comes an increase in costs. Many sleep centres around the UK do currently use thermoplastic moulded mandibular advancement splints to varying degrees of success and, whilst there are alternative materials available, the short term financial advantages in their usage is considerable.

Non-adjustable mandibular advancement splints

One piece mandibular advancement splints, as shown in Fig 1, posture the jaw in a fixed position to open the airway. The main advantage compared to semi-adjustable or adjustable appliances is the cost, which is considerable lower, but in the longer term they may need more frequent replacement. The dentist’s role here is to take impressions of both arches and communicate with the laboratory the degree to which the mandible needs to be advanced. The vibration of the soft tissues that result in snoring can differ from time to time. For example, many patients anecdotaly mention the increased impact of snoring with alcohol consumption and in this particular situation the lack of adjustment can be considered a disadvantage.

Adjustable mandibular advancement splints

Two piece appliances such as the ‘Sleepwell’ device, shown in Fig 2, allow the patient to adjust the position of the mandible for ideal effectiveness and can also be adjusted at a later date using thermoplastic materials.
The clinical requirements for the manufacture of this type of device are for accurate impressions of both arches (ideally in addition cured silicone) with a centric occlusal record.

Adjustable cobalt chrome mandibular advancement splints

Applications such as the ‘Somnowell’ device, as shown in Fig 3, use a skeletal frame on both arches linked with a piston-rod connector which gives freedom of jaw movements except in the posterior direction. The benefits of using CoCr for MAS appliances were described in the literature (S.P Ash & A.M. Smith J of Orthod 2004). The use of CoCr means that the laboratory fees are higher and the provision of this type of appliance also require a facebow recording and a higher degree of clinical accuracy.

However, in the longer term it presents with excellent durability and longevity in the oral cavity, as well as having additional benefits such as improved oral hygiene and minimal intrusion into the tongue and freeway space. Given that that CoCr does not absorb moisture, it is far harder for micro-organisms to colonise the material and its relative high strength helps to keep the bulk down, compared with alternative materials. For many years CoCr has established itself as the standard for partial denture construction and its clinical advantages are well documented.

CoCr is not currently in widespread usage for MAS and the relatively higher production costs may discourage many practitioners from exploring this option. That being said, how much would you be prepared to pay for a good night’s sleep?

For the purposes of this article I have presented only a few of the many options currently out there. For those dentists who wish to offer MAS to their patients or even wish to help their own snoring issues, an understanding of sleep related breathing disorders is essential and a structured training programme offers the best way to carry this out. Remember that even though MAS may be effective for mild to moderate sleep apnoea, the SIGN 2003 guidance only supports their usage for snorers with mild sleep apnoea with normal daytime awareness. As such, whilst we as a profession may be in a position to help simple snorers, we are not always in the best position to diagnose and treat the more moderate to severe forms of sleep apnoea, which is a potentially a life threatening condition.