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## **Temporomandibular Disorders**

### **Treatment with Cerezen® - A splint alternative?**

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## **Introduction**

Temporomandibular disorders (TMD) are a range of conditions that affect the TMJ and / or the muscles of mastication.<sup>1</sup> The commonly occurring TMDs are myalgia, arthralgia and disc derangements. These presentations have been known by a wide variety of names including for example TMJ dysfunction and myofascial pain.

TMDs are very common. It has been shown that 25% of individuals experience a TMD at some point in their lives.<sup>2</sup>

Contemporary guidelines<sup>3,4,5</sup> are that local conservative physiotherapy type measures should be used as a first line of management, which includes resting the TMJ and muscles (by avoiding chewing hard foods etc.), jaw exercises and heat application. Occlusal splints have also been an important part of the management of TMDs for many patients to supplement the local measures. Soft splints are most commonly provided in general dental practice. Alternatively hard splints such as the Michigan splint are sometimes used. Not all patients are able to tolerate a splint. Splints interfere with speech and other oral functions so wearing a splint in the daytime is difficult or not possible. Prolonged use of splints can cause unwanted occlusal changes.

An alternative treatment method, Cerezen®, has become available to treat the jaw pain and symptoms associated with teeth grinding and clenching that avoids many of the problems associated with occlusal splints. The Cerezen device is made from EShell 300. This material is a liquid, photo-reactive acrylate and has been used in hearing aid shells and otoplastics for the last 10 years. The Eshell 300 material is CE certified and has been approved for use by the Health Products Regulatory Authority and the European Notified Body.

The aim of this article is to describe this treatment method, highlight potential advantages and disadvantages of the devices and to present a case treated with the device.

### **Cerezen®**

The Cerezen® device comprises a pair of removable custom-made 3D printed hollow inserts that are worn within the external auditory canal of the ear **Fig 1**.

The ear canal is located very close to the temporomandibular joint (TMJ) and the volume of the ear canal increases when the jaw is opened through movements such as chewing, smiling, and speaking. The Cerezen® device uses this anatomical change to exert a very small amount of pressure on the walls of the ear canal when the jaw is in the closed position. This encourages the patient to return to a tooth-apart position, minimizing the tendency to clench the jaw, grind the teeth and tense the surrounding muscles **Fig 2**. The inserts themselves are almost invisible. They have small tabs for easy insertion and removal by the patient.

The appliances are suitable for patients with TMD pain arising from either the TMJs or muscles of mastication. Patients suffering ear disorders such as infection or developmental disorders however cannot use Cerezen® appliances.

### **Making and fitting the appliances**

The devices are custom-made to the shape of the ear canals. In order for the device to be manufactured, a silicone impression of the ear canals needs to be taken. This is performed by a trained audiologist. Before impressions are taken, the audiologist carries out an ear examination to ensure that there are no contraindications to treatment such as

ear infection. Ears may be cleaned of excessive wax at that same appointment prior to impressions being made. The duration of this appointment is usually approximately thirty minutes.

The audiologist then sends the impression to the Cerezen® laboratory. The Cerezen® devices are manufactured using CAD CAM technology. The devices are returned to the dental surgery within two weeks.

At the fit appointment the clinician facilitates the device fitting, making sure the patient is able to insert and remove the devices **Fig 3**.

Instructions on use of the devices and on cleaning and maintenance are provided. It is recommended that appliances are used initially in the daytime in order to produce quicker adaptation and clinical benefit. It is suggested that patients should aim towards wearing the appliances for 18 hours a day during the first month, for 20 hours a day in the second month and 21 hours per day in the third month and increase thereafter. The appliances should be cleaned each time they are removed from the ears. They may be wiped with a tissue or an alcohol wipe and cleaned in soapy water. They should be air dried on a dry tissue. The fit visit takes approximately 20 minutes.

As with other dental appliances, there is a process of adaptation when the patient must adjust to the presence of the appliances. This time varies between patients.

Any problems relating to the fit of the appliance must be dealt with by the audiologist.

Problems relating to TMD symptoms are dealt with by the dentist.

### **Case report**

A 38-year-old dental hygienist, Mrs J, presented complaining of bilateral facial pain. She was also aware of tense jaw muscles, neck pain and a fluttering sensation in the

ears. The facial pain was worse first thing in the morning and at the end of the day. She recognized that her symptoms were stress-related and she was aware that she was grinding her teeth at night.

She had suffered the symptoms for more than 15 years and had been diagnosed with TMD. Physiotherapy type treatment had helped the symptoms to some extent. She had been provided with both soft and hard splints but had ground through them. Moreover, Mrs J found that she could not use a splint during the day when working and that resulted in poor pain control.

The history and examination confirmed the diagnosis of TMD. Mrs J was offered the option of Cerezen® treatment which she accepted. An audiologist took impressions of her ears.

At the next appointment the hollow devices were fitted and instructions were provided **Fig 3.**

Initially, she started wearing them for a few hours a day, and then increased to 5 hours, and gradually for the whole day. It took her 5 - 6 weeks to adjust to them and forget they were present in her ears. She then used them constantly. Mrs J stated that Cerezen® improved her symptoms dramatically stating that: “the devices stop me having the tendency to grind my teeth, and they relax my jaw muscles”. Mrs J was pleased that she could still communicate with patients whilst working with nothing obviously present in her ears. More recently she began to wear them less frequently, and now only needs to wear the devices at night.

## **Discussion**

The clinical effectiveness and safety of the Cerezen® device was established in a

prospective, three-month, randomised, controlled clinical trial that included patients with TMD with myalgia, disc displacement with reduction, and/or arthralgia.<sup>6</sup> The Cerezen® devices in comparison with the stabilisation splint and jaw exercise produced a statistically significant reduction in pain within the first month of treatment, with further reduction observed through the duration of the study. No unanticipated adverse effects or serious adverse events were reported during the study, and there were no reports of diminished hearing acuity in patients treated with the device.

Patients in the study reported very high satisfaction. 100% of subjects in the Cerezen® treatment group indicated excellent (71%) or good (29%) overall satisfaction with the device.

Cerezen® appliances can therefore be extremely effective in controlling TMD symptoms. They have the particular benefit that they can be used in the daytime and, unlike occlusal splints, do not interfere with speech or other oral function.

In conclusion, whilst further clinical studies will provide greater clarification of the benefits of Cerezen®, in particular which type of patients should experience greatest benefits, Cerezen® has shown significant advantages when compared with conventional splint treatments.

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Fig 1 The Cerezen devices

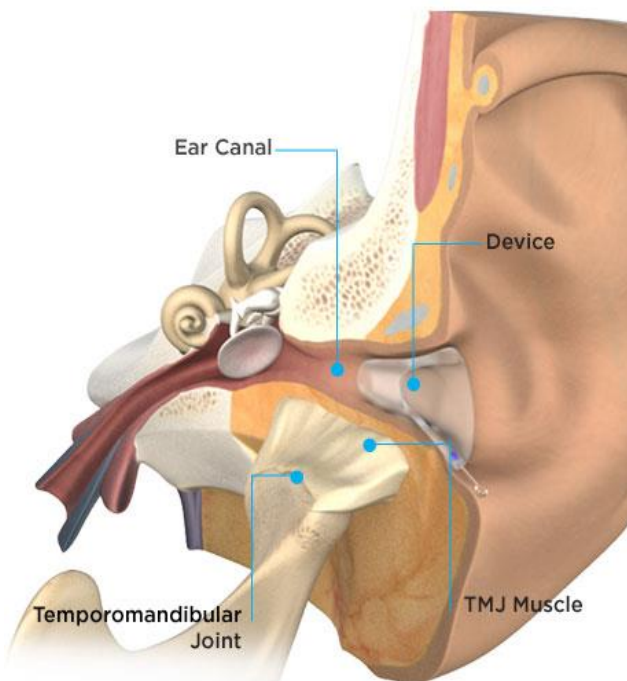


Fig 2 The Cerezen device positioned in the ear. Note the relation to the posterior of the TMJ.



Fig. 3 Cerezen® device placed in the ear