No clasps, please!

by Ulrich Heker, Owner-manager of TEETH’R’US

Patients in other European countries are increasingly conscious of the aesthetic potential, practicality and cost effectiveness of precision connecting elements, such as telescopic crowns and attachments. Whilst relatively unknown in the UK, the methods are within the reach of UK dental practitioners with recourse to good dental technicians, and this article gives an illustrated overview of the basic principles of these techniques.

‘Do I really need those ugly clasps with my new teeth?’

These or similar patient thoughts are probably familiar to you as a practitioner. Today’s patient puts an increasing value on their health and appearance in the pursuit of beauty and youth with an increasing range of services such as Botox, aromatherapy and Ayurveda at their disposal. This includes dental treatment, and consequently, interest in unobtrusive and invisible dental replacements without clasps is continuously rising. After all, who wants old-fashioned fixtures smiling from between young lips to represent their ‘smile as the mirror of the soul’?

In Germany, this need is met using precision connecting elements and a combination of permanent and removable dentures. These combination prosthetics provide a very comfortable and aesthetic solution, particularly where the remaining natural teeth still provide a stable foundation.

Combined dental replacement is generally applied when a completely fixed replacement such as an implant is not feasible and can also be, in part, for cost reasons or when a pure bridge construction becomes too expensive.

Tooth replacement is generally achieved using partial dentures and fixed or removable bridges. These are attached to the columns of the remaining teeth using a variety of available methods.
Not all patients can afford to proceed with implant restorations or cosmetic makeovers and this is where precision milled removable dentures are highly applicable. This is in no way an all or nothing option as the greatest opportunities for treating almost toothless jaws arise when combining implants and precision connecting elements.

The precision connecting elements dealt with in this article include all constructs which are prepared using precision milling. This is achieved by using a generally cylindrical mill which is capable of producing absolutely parallel surfaces, grooves and cavities.

Precision connecting elements can be divided into four major categories as follows:
- telescopic crowns
- attachments
- bar connectors
- bolt prosthesis e.g. key slide dentures or swing-lock dentures

**Telescopic crowns**

As a telescopic crown always consists of two parts, it is also referred to as a double crown. On the one side there is the bonded primary or inner telescope crown and the removable outer telescope that interlocks with it. Telescope crowns have become a standard in most European countries.

For the restoration of a set of teeth displaying a wide gap, their advantage lies in the problem-free enlargement of the replacement dentures. It is also eminently suitable if one of the pillar teeth has been removed. However, the technique requires a high standard of preparation and processing, both by the dentist and the dental laboratory. A disadvantage of the telescope crown is that it can appear a bit clumsy and bulky due to its structure. Viewed externally, this form of prosthesis is indistinguishable from a full prosthesis but has the benefit of secure attachment and increased bearer confidence.

Next to attachments, telescopic crowns are standard in Germany, Switzerland and Scandinavia for the treatment of large dental gaps with a prosthesis.

**Attachments**

If single teeth are missing and tooth implants are out of the question, removable dentures are often used. In this context the so-called attachment is applied. This is a mounting or mounting element which serves as a connection between the remaining teeth and/or single, crowned teeth, the so-called anchor teeth or abutment teeth.

**Intracoronal attachments**

Intracoronal attachments are fitted into an abutment tooth. Because the load or force of the attachment is distributed predominantly along the longitudinal tooth axis (1), they can be sited conveniently throughout the jaw. Intracoronal attachments require a larger sacrifice of dental material (1); however, as the dental replacement is attached directly to the crown, there are no niches where debris or dirt can accumulate (2).

**Extracoronal attachments**

Extracoronal attachments have fittings to
the tooth exterior. The loss of dental substance during preparation is far less as the important components are situated on the exterior of the crown.

This does, however, mean that the line of force or load is not along the tooth axis. A further disadvantage with extracoronal attachments is, for example, that cleaning is made more difficult for the patient due to projecting elements.

**Intercoronal attachments**

Here, the precision elements required for the attachment of the denture are placed interdentally between two or more primary interlocked tooth columns. Again, this complicates care of the interdental area between the connected crowns (1). All these attachment variants can be purchased either off the shelf or, preferably, individually tailored by a good dental laboratory.

In order to avoid detrimental forces on the sometimes-delicate attachments, they should always be used in combination with stress breakers.

**RSS attachments**

RSS attachments (a form of double-shouldered attachment known as Rillen Schulter-Geschiebe or RSS-Geschiebe in German or groove-shoulder attachment by Bego 2001) are prepared in a similar manner to bonded crowns. Horseshoe-shaped elements are attached to the oral side of the crowns (hiding them from view) to which the matching interlocking denture with mirrored elements can attach.

They require less loss of tooth material than telescopic crowns and give a better aesthetic, within the limitations of a smaller element surface area and lower stability.

**The pros and cons of bespoke and off-the-shelf attachments:**

They are comparable, where the bespoke attachments are often more secure due to the precision manufacture and choice of materials.

Because of the mechanical burden through rotational and tilting forces, there is a risk of deformation and breakage.

**Bar connectors**

Bar connectors are primarily seen as locking and, therefore, stabilising elements. They are frequently used in combination with implants. The main disadvantage of the bar connector is the difficulty in cleaning and thus an increased likelihood of inflammation of the gingival tissue.

Bar connectors also require more space and this provides the dental technician with additional challenges (1, 2, 3). The flexibility for future expansion or adaptation of the prosthesis is also limited when compared to telescopic attachments (1).

**Bolt or key slides**

An ideal retaining element is the individually produced or ready-made swinging hinge.
It enables friction-free insertion and removal of the denture. In the locked setting the detachable denture section is fixed securely using a swinging hinge.

The advantage of the bolt or key slide prosthesis is the pressure-less attachment, similar to an interlock, of the prosthesis to the pillar teeth. These are consequently not exposed to damaging forces during the insertion and removal of the prosthesis.

The disadvantage is the elaborate construction and the frequent steric problems for the placement of the bolt. Additionally, the bolt requires considerable manual dexterity on behalf of the patient!

Conclusion

This article provides an overview of a wide variety of European answers to providing cost-effective and aesthetic solutions for patients using precision connecting elements. They bridge the gap between conventional dentures and pure implant solutions and give the dental practitioner a wider toolkit to match individual circumstances, taking into account not only the physical oral environment of each patient but also their financial and aesthetic aspirations.

Each type of precision connecting element – telescopic, attachments, bars and bolts or key slides – has its own unique features in preparation and application. It is my intention to consider these in more detail individually in future articles if the reader is interested.

The manufacture of a perfect prosthesis, one that is not perceived as a foreign body in the mouth by the patient, requires great mechanical skill from a dentist and dental technician. Only the close interaction by both specialists delivers the desired result for the patient.

References


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‘Excellence is the result of always striving to do better’
– Pat Riley