No clasps, please!

Part 4: These crazy little things ...

by **Ulrich Heker,**
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Where the reduction in dentition consists of more than one tooth, on one side of the jaw, the solution can be difficult, laborious or uncomfortable for the patient. In this article, we report on the possibilities for the treatment of curtailed free end edentulous ridges via removable prosthetics by using key-slides, in particular the 'Degudent multiSafe Riegelblock'.

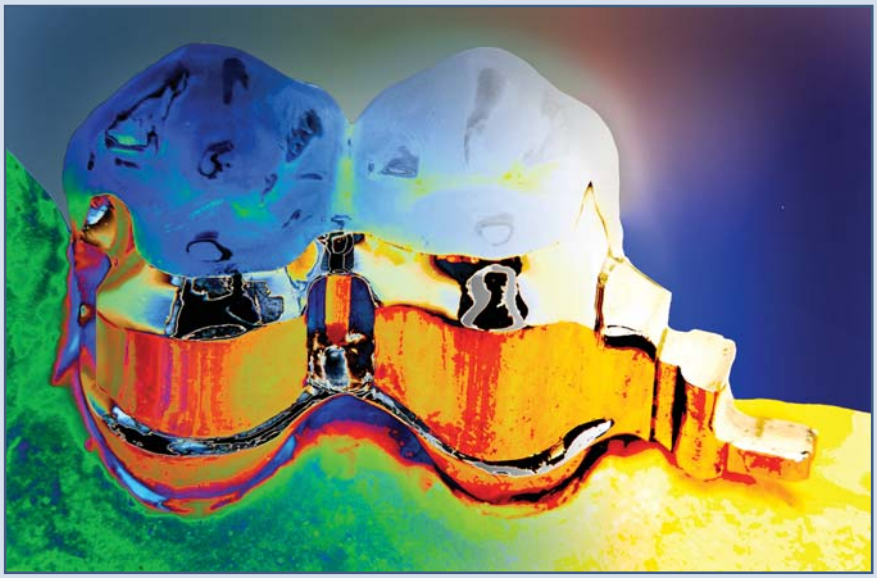
1:DeguDent Multisafe Lock

Description

A monoreductor is a one-sided prosthesis which is usually only made for one side of the jaw.

2: Showing an asymmetrically shortened dental row in the upper jaw. The plan is to fit a channel shoulder pin (RSS solution)

This fills in free ends of free end edentulous ridges. The prosthesis is not supported by a tooth at its end; the prosthesis rests on the jaw ridge on one-half of the jaw.



The construction principles of this type of prosthesis are based on a precision mechanical attachment element, the key-slide, which is attached to terminal crowns. The removable part of the prosthesis is fixed to this key-slide and prevents accidental removal.

3: Detail showing the key-slide mechanism

The individual components

The fixed primary unit is attached externally to the crowns or bridge.

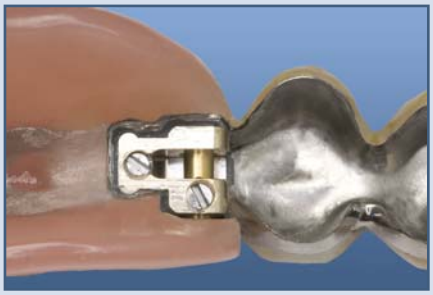
4: Mounting of the slide: here with a telescope double crown solution

5: Precision milling of the telescopes

6: Ready for manufacturing the secondary part

7: The secondary construction: lingual view

There is a small spring-loaded bolt in the removable secondary element, which ensures the firm attachment of the denture base. All that is visible is a small button on the interior (Fig. 7). Pressed for prosthesis removal, this will spring back into the final position after insertion.



8: MultiSafe seen from below: telescope solution

I have used the multiSafe key-slides of the Degudent company here as an example of key-slides. They can be obtained from various sources. The new multiSafe is an extra-coronal fixing-, supporting- and connecting element. The multiSafe is used ideally for monoreductors, partial prostheses and supra-constructions of implants.

9: The Degudent multiSafe key-slide

10: MultiSafe seen from below: RSS solution

Applications

A monoreductor is primarily used to replace a maximum of two missing teeth in order to avoid an overstressing of the abutment teeth and the slide by pressure and torsion during chewing.

11/12: Inserted monoreductor in upper jaw: RSS variant

The usual situation for a key-slide prosthesis is generally the absence of the first and second molars on one side. If a prosthesis mounted on an implant is not appropriate, then the two premolars are crowned and the molars are replaced by a monoreductor prosthesis.

This requires a sufficient vertical sizing of the slide as the construction requires a minimum height for the clinical premolar crowns. The premolar columnar teeth must be stable parodontally and fulfil the requirements of bridge abutments for fixed dental replacement.

Note that if the crowns on the premolars are too short, they impede later hygiene, as a slide resting directly on the gingivum is difficult to clean, thus creating the risk of caries around the distal crown periphery.

13: View of the right side: blocked telescopic crowns

- The base should be made with as large an area as possible to facilitate a good distribution of pressure and torsion and also to avoid detrimental forces impinging on the abutment teeth and the slide-element.
- The forces on the saddle and denture base should be evenly applied, preferably vertically. The saddle should only be pressed briefly onto the gingival tissue through chewing to find its support.

14: Inserted monoreductor in upper jaw: RSS variant

15: Inserted monoreductor in lower jaw: telescope variant

- One should take advantage of all anatomical aspects in order to prevent a gradual compression of the saddle.
- One must ensure a 100% secure bolting of the monoreductor in situ. Otherwise the small size could present an aspiration hazard!
- **Regular checks** of the denture base and the abutment teeth as well as the lining are very important. This way, the saddle does not lie hollow and possible damage is avoided.

History

In the past, foreshortened free end edentulous ridges were treated using removable cast metal partial dentures that were far too small. These small removable prosthetic appliances were in the past often retained by double clasps. These were used to provide additional retention to hold the small denture in place. This carried the replacement teeth. These were known as 'spider' or 'clasp' bridges. Such appliances are contraindicated as they pose a great risk of swallowing or inhalation where there is a malfunction or loose fitting.

Construction options

The fixtures to the teeth can be either attachments, telescopic crowns, or with appropriate enlargement clasps.
The monoreductor is, with correct construction, a good and long-lived functional dental replacement when relined at regular intervals. This avoids the already mentioned excessive leverage on the remaining dentition.

A solution of short posterior saddles using a precision mechanical element can be achieved in two ways:

- **Variant 1 – RSS solution**
  Treatment of the terminally present teeth with blocked metal-ceramic faced crowns (primary blocking) in which a horseshoe-shaped groove is created in each crown permits the coupling to the removable part. Note: With difficult space constraints the bridge element can be attached as a 'Pontic'; the leverage on the bridge abutment is not altered; the aesthetic and constructive advantages are a benefit for the whole denture.

16: Milled intracoronal horseshoe-shaped elements showing a clearly visible [spur] with the RSS solution

- **Variant 2 – Telescope solution**
  The second fundamental variation is based on the provision of telescopic crowns. These are also primarily blocked. Here, the attachment to the abutment teeth is achieved by the equally blocked secondary crowns, which are usually faced with composite.

17: For comparison, the construction as a telescope variant

Choosing a construct

Whether to use an RSS or telescopic attachment is a matter of choice and is dependent to a large degree on the existing clinical situation. The majority of monoreductors that we make are RSS variants.

The advantages are using toothcoloured anchor teeth with ceramic facings, and the retention provided by the abutments, when the denture is removed. The height of the bite is also ensured.

The telescope variant gives a slightly better fixing, with an easier handling on insertion. It does, however, require considerably more room due to the construction based on primary and secondary crowns. This requires a greater loss of original tooth material during preparation and there is a risk that the final monoreductor is too bulky.
When the denture is removed, the primary crowns are visible as gold caps, especially in the lower jaw.

From a material/technical point, we prefer a metal ceramic veneer.

18/19: Comparing RSS on the top and the telescopic solution on the bottom

Advantages of key-slides

- The integrated attachment is very good at absorbing all the forces arising (especially the transverse ones) and simplifies insertion by the patient
- Only high-quality materials (Degulor, HSL, etc.) are used
- Automatically fits into the primary component
- Is released automatically by a short pressure on the slide axis
- Compact housing for difficult space conditions
- Increased resorption of the alveolar ridge is avoided by regular relining
- Longevity and a high degree of comfort for the patient if prepared according to their needs and checked on a six-monthly basis
- Minimal perception as a foreign body by the patient and rapid acclimatisation phase

Disadvantages

- Demands a certain amount of dexterity and practice on insertion. Special consideration with older people!
- If one of the abutment teeth is lost, the denture cannot be rescued!
- Also: cannot be extended
- Needs to be particularly well-serviced in the upper jaw, when the saddle is affected by gravity

Alternatives

- Removable cast denture with a sublingual arm or plate with cast clasps on the opposite side. A cost-effective solution with all the disadvantages of the clasp cast
- Acrylic denture with curved metal clasps – no comment!
- Implants, either as single implants or an implant bridge. Dependent on clinical suitability. Excellent and even more comfortable, but also the most expensive variant. Always associated with a clinical intervention
- Combination of (own) abutment teeth, implants and slides are common possible alternatives
- Cantilever bridge fixed alternative for the replacement of one tooth only up to premolar width. A cantilever bridge is a fixed bridge that attaches to adjacent teeth on one end only

Conclusion

In this article we described the possibilities for the treatment of free end saddles via removable prosthetics by using key-slides, illustrating when and how they can be applied, their pros and cons.

Key-slides are an effective solution for single free end saddle cases and intermediate in cost between dentures and implants.

They do require technical skill and expertise. The authors are available for further information and seminars for interested parties.

Ulrich Heker will have a stand at this year's BDTA Showcase with copies of all *The Technologist* articles in the series 'No clasps, please!'

Ulrich Heker *Christian Eis*

About the authors

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Images: Practitioners – Christian Eis, Kleve, D and Barbara Heker-Stenkhoff, Essen, D

core verifiable CPD
materials and equipment

An introduction

by **Susan Bruckel**

Welcome to the second article on health and safety. Two topics that seem to pop up on an almost daily basis are COSHH and working with young people, so that is where I thought I would focus my attention in this issue.

1) Control of Substances Hazardous to Health Regulation 1999

There are two stages to this control:

a) Ask the manufacturer for a data sheet of all substances used. A data sheet details exactly what the substance contains, a minimum and maximum exposure limit, information regarding how to store the product correctly and what to do should there be an incident that requires the use of first aid.

b) Undertake a risk assessment of all the substances being used. This is required by law and forms the first steps towards creating a safe working environment. Remember that risk assessments need to be reviewed on a regular basis and, if necessary, revised.