

# Transversal screw-retained prostheses fixed on dental implants

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## Summary

When a screw-retained prosthesis is to be used, the choice has to be made between the use of a transocclusal (TO) or transversal (TS) screw.

At the present time, many systems that enable such prosthesis to be manufactured are available; however, there are some limitations to be encountered. The disadvantage in using a TO screw is the need for occlusal openings to the screw. However, this requirement is not needed with a TS screw; but it is necessary to have good oral access to the TS screw that fixes the prosthesis to the abutment, usually in the palatal or lingual area. This oral access is often limited by the narrow choice of abutment types available (location, angulation, and length of the TS screw) and, furthermore, for systems without a positioning element a transfer key needs to be manufactured.

Impladent system implants (Lasak, Czech Republic) were used exclusively in all cases. The Impladent system enables the treatment of a wide range of conditions (Figs. 1 and 2), thanks to a universal system of TS abutments having been developed for this system in recent years.

The abutments are made in 18 size modifications; each abutment has two screw threads to allow the TS screw to be placed in an ideal position with regard to the octagon of the fixture. The transversal screws are available in four lengths.

### *Advantages of use of the universal system of TS abutments:*

- the possibility to fit individual crowns onto abutments without the need to use any further antirotational elements
- the easy, non-destructive removal of superstructures from abutments when required
- the wide range of abutments available



Fig. 1: Single crown, fixed by TS screws



Fig. 2: Screw-retained, fixed bridge

### *Disadvantages of use:*

- the system is for use with prostheses with a metal framework only
- either a palatal or lingual opening hole to the screw

## Preparation of a screw-retained prosthesis fixed on a TS abutment

In order to reduce chairside time, the treatment should be so organised such that most of the steps are transferred to the dental laboratory. The impression is therefore taken at the level of the fixture so that the laboratory technician can select the most suitable abutment on a model.

1. SURGERY – the main position impression is taken using an impression coping – attention should be paid to ensure a precise complete contact between the impression elements and the implant, the impression of the opposite jaw, and possibly also the jaws' relationship.

2. LABORATORY – after checking that all the impression parts are rigidly fixed in the impression material, a model is made using a high-quality plaster type IV (extra hard stone) simulating gingiva, a so-called 'gingival mask'. A repositionable plate or other suitable socle systems can be used. Less desirable is the use of two different plaster types (as in the classical method of model making).

The following dimensions of TS abutments are available:

- height of the gingival: 1 - 2 - 3 mm
- height of the centre of the TS screw-opening from the shoulder: 2 - 2.5 - 3 mm
- angle between the TS screw and the longitudinal abutment axis: 70 - 65°
- length of TS screw head: 1 - 2 - 3 - 4 mm

After a suitable abutment has been chosen the prosthetics can be adjusted with regard to an individual's requirements by grinding or milling. The prosthesis needs to sit accurately on the shoulder (to be checked by microscope) and the TS screw must fix the construction firmly to the abutment.

After the faceting is ready (incl. glazing, etc.), the smoothing of the prosthesis-abutment contact is to be undertaken.

3. SURGERY – The exact positioning of the abutment can be speeded up with the use of a transfer key – its use, however, is not essential. The prescribed tightening torque for fastening abutments needs to be adhered to in order to ensure a long-term functioning of the prosthesis without problems. The prosthesis is then attached and the articulation possibly adjusted if necessary.

Successful treatment using TS abutments requires a high-quality cooperation between surgery and laboratory and the relevant material supplies. With the Impladent system and its wide range of TS abutments that can be adjusted to individual needs, we are able to treat a wide spectrum of the problems that we encounter. The simple process of reviewing all prosthetic components and the high aesthetics of prostheses applied in frontal areas are the main advantages of this system. In lateral locations, one has to accept that the TS screw is visible from palatal and lingual positions.

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