A simplified method for the removal of cemented implant prosthetics

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There are times when it becomes necessary to remove the cemented prosthesis with one or more implants and the prosthesis is not amenable to conventional crown and bridge removal devices. In order to remove these prostheses, we need to gain access to the abutment screws by drilling through the crown or bridge. The challenge is to create the smallest possible access holes in the implant prosthesis.

I was lucky enough not to have a patient with a loose or damaged bridge to use for this presentation, so I used a patient education model to provide the images to facilitate the description of the technique (Figs. 1a & b). Figure 2 shows the location of the implants.

Constructing the device

The master cast that was used for the construction of the implant prosthesis is the central element for this technique (Fig. 3).

Long screws from impression copings (Fig. 4) or long laboratory screws are inserted into the implant analogues (Figs. 5a & b). The cast is blocked out with restorative wax to act as formwork for the construction of the device (Figs. 6a-c). The wax should extend for at least one tooth on either side of the prosthesis.

If no tooth is present distal to the prosthesis, then additional teeth are covered anteriorly to maximise stability of the device. The wax should also block out the full dimensions of the prosthesis. I like to construct the mesial aspect of the device to be sufficiently wide and robust for a finger or thumb to be readily placed on this area for stabilising the device during preparation of the access holes.

The model and the screws are lubricated with either petrolatum or a water-based lubricant. Auto-polymerising or light-curing resin is adapted to the cast to cover the adjacent occlusal surfaces and encompass the screws in the implant analogues (Figs. 7a & b).

I prefer to use GC pattern resin in the later stage of polymerisation, I remove the screws before they potentially become locked in the resin. Once the material sets, it is trimmed and polished (Figs. 8a & b) then checked for stability on the model. Additional material can be added if required.

If a stone model of the prosthesis is available, it is convenient to confirm the stability of the device and to assess that there is no contact between the prosthesis and the device (Fig. 9). The intaglio surface is adjusted as required to ensure appropriate adaptation.

In the clinic

The chairside process is simplified by the use of this acrylic resin guiding device that provides a visual aid for the appropriate position for drilling the access holes. Ideally, porcelain should be removed using a diamond high-speed bur with copious irrigation. I prefer to use a round diamond bur for this purpose, as it is less likely to cause porcelain chipping. If the prosthesis is metal ceramic, the substructure is first penetrated with a small round carbide bur. Subsequently, a metal-cutting tungsten carbide bur is used to widen the access as required. Figure 10 shows a screwdriver passing through the guide into the abutment screw. Figures 11a and b show the precision of the preparation without over-preparation.

Once the access hole has been debrided of obstructing materials, an appropriate screwdriver is inserted. In order to prevent ceramic delamination, it is important to ensure the driver is not contacting any porcelain before significant torque is applied. I initially insert the driver and inspect for lack of contact with the porcelain. Following, I apply light hand torque to the driver in order to determine that it is fully seated before a second inspection to ensure no further contact. Finally, the screw and the prosthesis are removed.

Discussion

Drilling free hand into the prosthesis with a guide can result in oversized access holes and wasted chairside time. The primary goal of the method described here is to maximise laboratory procedures in order to reduce chairside time. We also minimise the size of the access holes, which reduces the damage to the prosthesis.

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