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A Clinical Technique for Separating Implant-supported Restoration from Titanium Abutment

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A patient reported to the Department of Prosthodontics with a fractured dental prosthesis. The implant prosthesis was Porcelain-fused-to-metal (PFM) type which was fractured. It was a cement-retained implant prosthesis. The abutment along with the prosthesis is unscrewed and separated from the implant fixture [Table/Fig-1].

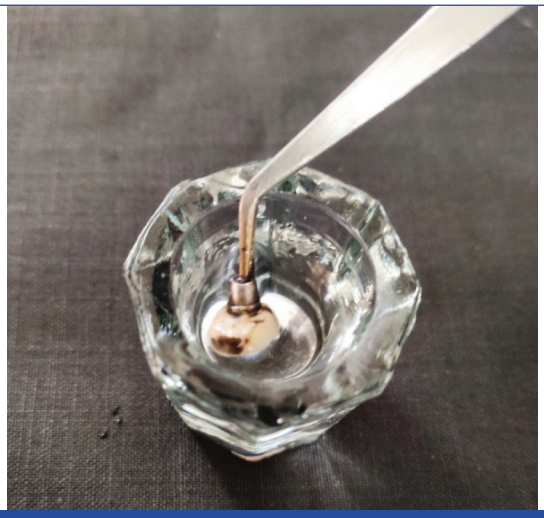
The separation of prosthesis and abutment was planned in-office instead of sending it to a dental laboratory. The prosthesis and titanium abutment was securely held with an artery forceps. The abutment prosthesis junction was heated for around 15-20 seconds over the Bunsen burner as shown in [Table/Fig-2].

Uniform heating was achieved by rotating the abutment -prosthesis assembly while heating over the burner flame. After the uniform heating, the prosthesis-abutment assembly was immersed in room temperature water and allowed to cool down till room temperature [Table/Fig-3].

Once, it cooled down to room temperature, it was removed from water and air dried using three-way syringe and reheated over the Bunsen burner. The heating and cooling the prosthesis-abutment assembly was repeated for 2-3 times and the abutment and prosthesis were pulled apart from each other to get them separated [Table/Fig-4].

[Table/Fig-1]: Titanium abutment -Prosthesis assembly showing fractured PFM crown.

[Table/Fig-2]: Heating the abutment -prosthesis assembly over the flame.



[Table/Fig-3]: Cooling the abutment-prosthesis assembly to room temperature.

[Table/Fig-4]: Pulling apart the abutment from the prosthesis.

As the alternate heating and cooling disintegrated the luting cement the abutment and prosthesis got separated from each other [Table/Fig-5].

[Table/Fig-5]: Prosthesis separated from abutment.

DISCUSSION

Intraoral Implant prosthesis can be cement-retained, screw retained or screwmentable. Screwmentable prostheses were developed to combine the benefits of screw retention and cement retention. Each type of prosthesis i.e., cement-retained or screw retained or screwmentable has its own advantages and disadvantages when compared with the other types. Selection of cement-retained or screw retained prosthesis as treatment choice depends on various clinical scenarios [1,2]. The luting agent recommended for implant prosthesis though is a provisional cement, but most clinicians use a definitive glass ionomer or resin based luting agent in most screwmentable restorations. This is because retrievability of the prosthesis is nowadays simpler due to the maintenance of abutment screw access channel patency. Intraoral separation of the ceramic or metal superstructure from the titanium base abutment is not easy especially in cases of pure cement-retained prosthesis. Hence, most prostheses that are inserted nowadays are screw or screwmentable. In the screwmentable cases, the abutment along with the prosthesis was unscrewed and separated from the implant fixture. This is then sent to the dental laboratory for separation of superstructure by heating it in ceramic furnace at high temperature [3-5].

Once the abutment and the crown are separated, it is sent back to the clinic for further clinical procedure of impression making. Sending the prosthesis-abutment assembly to dental laboratory adds up in treatment cost, waiting period, treatment visits and it also require to place healing abutment till the time laboratory send the separated abutment and prosthesis for further procedure. Repair of the present prosthesis, aesthetic-shade correction in the present prosthesis and change of present prosthesis due to prolonged use are some of the major clinical situations where prosthesis and abutment separation is required [4]. Various other methods like use of chemical agents like acetic acid, ulrasonic vibrations, heating in dental furnace can also be used for separation of abutment and prosthesis [6-8].

All previously discussed techniques [6-8] required certain amount of time to achieve separation between prosthesis and abutment due to immersion in chemical agent for some time or involvement of dental laboratory. The technique presented here is in-office clinical technique which does not require special equipment, chemical agent or dental laboratory support for separation of prosthesis and abutment. Controlled change by alternating high and low temperature application adequately disintegrates the luting agent and consequently separates the components. The slow heating on the burner prevents oxidisation and deterioration of the implant abutments. Further the slow and steady increase in temperature for few seconds does not damage the ceramic restoration. The unique metallic property and ability to withstand high temperature of titanium and porcelain prevent any property change of abutment and prosthesis due to heating over the flame for few seconds [3].

CONCLUSION(S)

The present article describes a controlled thermal procedure which can be done in the clinical set-up to safely debond a single or multiple-unit implant-supported cement-retained prosthesis from a titanium base implant abutment. This technique reduces the waiting time, clinical visits and cost. This technique has good success rate for single crown and also for fixed dental prosthesis with multiple abutments.

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