Modification of framework design for an implant-retained fixed restoration helps when proximal contact loss occurs

KEYWORDS
Dental implant; Proximal contact loss; Implant complication; Implant fixed restoration; Framework design

Among the post-treatment complications that arise after the implant prosthesis installation, the problem of disconcerting both the patient and clinician is a loss of proximal contact between the restored implant’s crown and the adjacent natural teeth. \(^1,\)\(^2\) When this occurs, patients may a food impaction, caries, and periodontal issues. \(^3\) Although it is not fully understood, the physiological mesial drifting of the adjacent natural teeth seems to be the most probable etiology for this phenomenon. \(^4,\)\(^5\) Regardless of the etiology, regaining the proper proximal contact can be quite challenging and troublesome unless the implant prostheses are retrievable. Therefore, securing the retrievability of implant prostheses becomes a prerequisite for solving complications associated with improper proximal contact.

This article presents a simple clinical method using a modified framework design to repair the proximal contact loss between implant retained fixed prostheses and adjacent natural teeth.

Methods/technique

Fabrication of a proper implant restoration begins with taking a good impression. Implant impression has to be accurate in capturing not only the implant itself but also the surrounding natural dentition and soft tissue around the implant. After taking the impression, a stone cast with the soft tissue model is fabricated.

Laboratory procedure

1. Prepare the selected abutments according to the angle and location of the implant and the occlusal clearance.
2. Similarly to the fabrication of a conventional ceramic-metal crown, develop an anatomical contour waxing and then cut it back to the dimensions needed for porcelain application.
3. At this point, create a wide mesial contact area and form a mesial box on the wax coping. This mesial proximal box must be deep enough to make room for the composite resin, and it must be provided with an undercut on four sides of the box to obtain mechanical retention (Fig. 1A). The dimension of the proximal box varies depending on the contact pattern between the teeth, but it is usually about 1/2 of the bucco-lingual tooth width and vertically to 2–3 mm downward from the area where the contact starts.
4. Invest and cast a framework and add a porcelain layer in the conventional manner. In this clinical case, a crown was fabricated with a screw access opening on the occlusal surface to achieve retrievability (Fig. 1C,D,E).
Clinical procedure

1. Place and tighten the prepared abutment after removing the healing abutment.
2. Remove the abutment-superstructure unit from the mouth.
3. Fill and bond a light-curing composite resin (Spectrum TPH3, Dentsply De Trey, Konstanz, Germany) in the mesial proximal box and establish the adequate mesial proximal contact (Fig. 1B).
4. Remove the abutment-superstructure unit again from the mouth and light-cure the composite resin, and polish the interface.
5. After fitting, adjusting, and finishing, the prosthesis is seated intraorally with a definitive cement. For this patient, a resin cement (Maxcem Elite, Kerr Corp., Orange, CA) was used.

Maintenance procedure

During the periodic follow-up or after functional loading, if a loss of the proximal contact occurs between the natural dentition and the implant restoration, the implant-retained crown can be easily removed by unscrewing the
abutment screw. A clinician can reestablish the proper proximal contact by filling the mesial proximal metal box with new composite resin. The proposed technique is unique in that the mesial box created on the framework design is used for establishing proximal contact with the adjacent natural teeth. This technique allows for an easy and practical approach for clinicians when repairing the loss of proximal contact in implant-retained prostheses.

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