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Conservative Approach for Management of Tilted Abutment in Fixed Partial Denture- A Case Report

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Abstract

A common issue encountered is the mesial tilting of a mandibular molar abutment into the space previously occupied by missing anterior teeth. Because of this tilting, it is challenging to create a common path of insertion and prepare the abutment teeth along their long axes for a fixed partial denture. The treatment of tilted teeth can be accomplished by orthodontics or prosthetics. This case study demonstrates how a fixed partial denture can effectively restore function and aesthetics for a tilted mandibular second molar by using a proximal half crown as the preferred retainer.

Keywords: Questionable abutment, proximal half crown, tilted molar, and tilted abutment

Introduction

The tilted tooth is the most commonly observed questionable abutment by dentists, which needsto be taken into consideration as a viable fixed prosthetic

abutment.[1]The long axes of prospective abutments should converge by no more than 25 to 30 degrees, according to recommendations.[2]It is nearly impossible to align the mesial wall parallel to the anterior abutment when the distal abutment is significantly inclined without running the danger of damaging the pulp The primary cause of slanted teeth is the existence of opposing and neighboring edentulous gaps, which cause the distal tooth to migrate mesially.[3] Tilted teeth can cause food impaction, inadequate oral hygiene, dental caries, periodontal problems, and unstable occlusion[4]Consequently, it is advised to start therapy as soon as possible in order to preserve arch integrity and produce a stable occlusion.

For minor tiltingreconstructing or reshaping the tilted abutment's mesial surface can resolve the issue. However, with severe tilting, aligning the abutment teeth along their long axis and achieving a common path of insertion for a fixed partial denture becomes impossible.[5]More comprehensive corrective action is required in these situations. Orthodontic uprighting of the abutment teeth is the recommended course of treatment.[6]Other alternatives for treating a tilted abutment include the use of non-rigid connectors, telescopic crowns, and proximal half-crowns. The simplest and most conservative of them is the proximal half-crown, which can also be utilized as a retainer on the distal abutment[7]. The buccal surface is not intact in this preparation design; instead, the distal portion of the crown is rotated 90 degrees. This retainer is only appropriate if the patient has a low caries index and the distal surface is free of defects. In order to repair a lost mandibular molar, this clinical report outlines the use of a proximal half-crown as the preferable retainer on the distal abutment.

Clinical report

The primary complaint of a 35-year-old female patient was that her lower right back tooth was missing. An intraoral examination showed that 46 were absent (Fig 1). The mesial abutment (number 45) was vertically aligned, periodontally sound, and free of cavities. However, there was a mesial drift of the distal abutment (47) along with a reduction in the horizontal edentulous gap. The tooth had a strong periodontal foundation. A mesially inclined second molar and sufficient bone support were seen on the intraoral periapical radiograph (Fig 2).

Due to time and financial constraints, the patient selected a fixed dental prosthesis with a mesial half retainer on tooth 47 from among the available treatment choices. Using irreversible hydrocolloid (Tropicalgin, Zhermack), diagnostic imprints were created, and an interocclusal record was obtained. To assess the occlusion, diagnostic mounting was carried out, then mock preparation and diagnostic wax-up. An index of the wax-up was created using putty to facilitate the creation of a temporary prosthesis. For tooth 45's full veneer metal ceramic retainer and tooth 47's full metal ceramic mesial half-crown, tooth preparation was completed (Fig. 3).

The mesial surface of tooth 47 was aligned with the mesial abutment preparation insertion path. With minor reduction of the mesial cusps, an occlusal reduction ended at the distal marginal ridge, providing 1.5 mm clearance on the functional mesiobuccal cusp and 1 mm on the non functionalmesiolingual cusp. The buccal and lingual axial walls have grooves put in them parallel to the mesial surface. The mesio-occlusal boundary was reinforced by the addition of an occlusal offset.

To prevent the retainer from moving mesially, a countersink was also inserted into the distal channel. In

polyvinyl siloxane (Exaflex, GC), a final impression was created (Fig 4) The direct method of fabricating a provisional prosthesis was employed to utilize Luxatemp (DMG). It was polished and then cemented with Tempocem NE, DMG, a non-eugenol cement. Dental stone of type IV was used to pour the final impression. The prosthesis had a metal trial, and the marginal fit of the proximal half-crown received special attention. Next, the occlusion in the area of the second molar was improved. Porcelain was then applied to the pontic and mesial coping. Occlusion was examined in both centric and eccentric relationships during the bisque testing. After that, the finished prosthesis was cemented, checked to ensure correct occlusion, and glazed (Fig. 5,6).

Discussion

A common issue is a mandibular second molar that has tilted mesially into the space previously occupied by the first molar. This problem is further complicated by the third molar, which typically drifts and tilts mesially along with the second molar. Conventional preparation of the abutment teeth along their long axes makes it impossible to achieve a common path of insertion for a fixed partial denture. Therefore, the path of insertion for the fixed partial denture should be aligned parallel to the original long axis of the molar abutment before it tilted mesially, as dictated by the smaller premolar abutment.[5]

The fixed partial denture may not seat correctly as a result of the mesial surface of the pointed second molar interfering with the denture's insertion path. Recontouring or restoring the second molar's mesial surface can resolve the problem if the invasion is not too severe. More comprehensive remedial action is needed, though, if the tilting is extreme.

The ideal course of treatment is orthodontic uprighting of the slanted molar with a fixed appliance. This method serves to bridge bone abnormalities along the mesial surface of the root, better distribute pressures under occlusal loading, and better position the abutment tooth for preparation. This strategy has been validated by 8 photoelastic and finite element9 investigations.

Stress analyses have revealed that a mesially tipped molar will experience less stress along the mesial surface of its root with a fixed partial denture compared to without it. However, this results in increased stress on the premolar. If orthodontic treatment is not chosen, a fixed partial denture can still be implemented with modifications such as a proximal half crown, telescopic crown, or non-rigid connector.

Since telescopic crowns and non-rigid connectors require more extensive tooth preparations than conventional methods, the selection between these options should depend on the extent of prior damage to the abutment teeth.

In the current situation, a proximal half crown was chosen as the retainer for the tilted mandibular second molar due to its simplicity and conservative nature. Preparing a tooth with both mesial and lingual inclinations for a conventional fixed partial denture could result in excessive tapering of the preparation. A proximal half crown helps avoid this issue and is less likely to cause pulpal problems compared to a full coverage crown. Additionally, it offers better accessibility for both the dentist during finishing and the patient for cleaning.

However, certain conditions must be met for the success of a proximal half crown:

- The distal surface must be free from caries or decalcification.
- The patient must have a low incidence of proximal caries throughout their mouth.

- The patient should be capable of maintaining exceptional oral hygiene.
- If there is a significant height difference between the third molar's mesial surface and the second molar's distal surface, a proximal half crown is not appropriate.

Overall, the proximal half crown is a viable and conservative option, provided these conditions are met.

Conclusion

A proximal half crown can effectively manage the tilted abutment; however, the best course of treatment should be determined on an individual basis. In general, this method is less expensive, takes less time, and results in less tooth damage than orthodontic uprighting and telescopic crowns. The use of a proximal half crown as a retainer for a tilted mandibular second molar is highlighted in this clinical case, illustrating how it can offer sufficient function and aesthetics while making it simpler to maintain good periodontal health.

References

1. Tylmon SD. Theory and practice of crown and fixed partial prosthodontics (Bridge), 7th ed. St. Louis, CV Mosby Co 1978,184.
2. Reynolds JM. Abutment selection for fixed prosthodontics. J Prosthet Dent 1968;19:483-8.
3. Picton DCA. Tilting movements of teeth during biting. Arch Oral Biol 1962;7:151-9.
4. Lundgren D, Kurol J, Throstensson B, Hugoson A. Periodontal conditions around tipped and upright molars in adults. The European Journal of Orthodontics 1992;14(6):449-55.
5. Shillingburg HT, Sather DA, Wilson EL, Cain JR, Mitchell DL, Blanco LJ *et al*. Fundamentals of Fixed Prosthodontics, 4th ed. Chicago, Quintessence publishing co inc, 2012,216-21.
6. Khouw FE, Norton LA. The mechanism of fixed molar uprighting appliances. J Prosthet Dent 1972;27:381–389.
7. Smith DE. Fixed bridge restorations with the tilted mandibular second or third molar as an abutment. J South Calif Dent Assoc 1939;6:131-138.
8. Hood JA, Farah JW, Craig RG. Modification of stresses in alveolar bone induced by a tilted molar. J Prosthet Dent 1975;34:415-421.
9. Yang HS, Thompson VP. A two-dimensional stress analysis comparing fixed prosthodontic approaches to the tilted molar abutment. Int J Prosthodont 1991;4:416-424.
10. Shillingburg HT. Bridge retainers for tilted abutments. N M Dent J 1972;22:16-19.

Legend Figures

Figure 1: Intra oral Pre-operative view

Figure 2: Intra oral Pre-operative IOPA

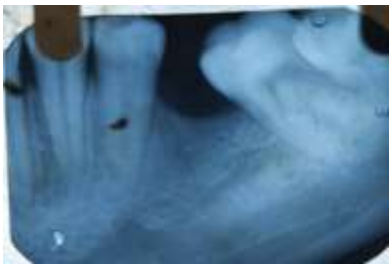

Figure 3: tooth prepation done

Figure 4: Impressions

Figure 5: Post-Operative occlusal view

Figure 6: Post-Operative buccal view