

**AN ALTERNATIVE APPROACH TO CREATE AN UNDERCUT IN ABUTMENTS FOR
REMOVABLE PARTIAL DENTURE****¹Dr. Raghavendra Adaki, ²Dr. Deepti Tambake Fulari, ³Dr Sandeep Patil and ⁴Dr. Shridevi R. Adaki**¹Professor, Department of Prosthodontics, Bharati Vidyapeeth Dental College, Sangli.²Assistant Professor, Department of Prosthodontics, Bharati Vidyapeeth Dental College, Sangli.³Assistant Professor, Department of Periodontics, Bharati Vidyapeeth Dental College, Sangli.⁴Department of Oral Medicine and Radiology, Bharati Vidyapeeth Dental College, Sangli.***Corresponding Author: Dr. Raghavendra Adaki**

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ABSTRACT

An innovative technique is presented here to obtain a retentive undercut without invading enamel, dentine. In this technique, retentive undercuts were created by performing crown lengthening procedure on the labial side of the abutment teeth to expose the tooth surface apical to the height of contour.

KEYWORDS: crown lengthening, marginal gingivectomy, undercut preparation.**INTRODUCTION**

Retention is an integral part of every removable partial denture.^[1] Undercut areas should be quantified to establish the exact location of the active retentive arms.^[2,3] In most instances, retentive areas can be located on the remaining natural teeth with the use of a surveying instrument and a diagnostic cast.^[1,4,5] This procedure is important for obtaining appropriate prosthesis retention during gingival-occlusal movement.

Occasionally, maxillary canines and pre-molar abutment teeth have insufficient or no suitable retentive undercut i.e. abutments with survey line close gingival margin. This might be due to the morphology or inclination of the maxillary canines and pre-molar in the arch. The facial height of contour of both maxillary canine and pre-molar is in the cervical third of the crown.^[6] Under such conditions, tooth contours may be modified to enhance an existing undercut or create a conservative undercut.^[7,8]

Various techniques have been described for creating artificial undercuts.^[9,10,11,12] These include fabrication of full crowns, class V amalgam or gold inlay restorations, use of threaded pins, recontouring the natural tooth surface i.e. Dimpling. These procedures require penetration into the enamel and dentine, which might increase the risk of caries and dentinal hypersensitivity. Alternative methods involve acid etching of enamel and use of resin bonded restorations.^[11] Studies have shown that, a total of 20.7% of the undercut areas obtained on restorative material (composite resin or amalgam) were

not intact, i.e. these surfaces had lost retention in two years after prosthesis insertion.^[3]

In situations where the abutment tooth that has survey line close to gingival margin, patients having gummy smile, gingival probing depth of ≥ 3 mm, crown lengthening can be performed to achieve a considerable or desired undercut.

This article describes an alternative procedure/ approach for creating undercuts for removable partial denture retainers.

TECHNIQUE

1. Survey the diagnostic cast and gauge the undercut of the abutment teeth.(Fig 1 and 2)
2. Clinical examination should be done to know the relation of marginal gingiva to buccal surface of tooth (Fig 3 and 4)
3. Perform sounding of the abutment tooth using graduated probe to determine the extent of undercut.
4. Provided the depth of gingival sulcus is ≥ 3 mm and with adequate biologic width, gingivectomy/ crown lengthening of the abutment tooth can be carried out.
5. Measure the amount of gingival reduction required to achieve the desired undercut based on clinical probing depth and radiograph.
6. Mark the gingiva for excision using indelible marker.
7. Perform gingivectomy/ crown lengthening around the abutment tooth under local anesthesia..clinically gauze the undercut (Fig 5and 6)

8. Make impressions using elastomeric impression materials and pour the impression using die stone.
9. Survey the master cast and gauge the undercut of abutment teeth. (Fig 7 and 8)

Legends of illustrations



Fig 1: Pre operative intra oral image of 13 showing of lack of retentive undercut.

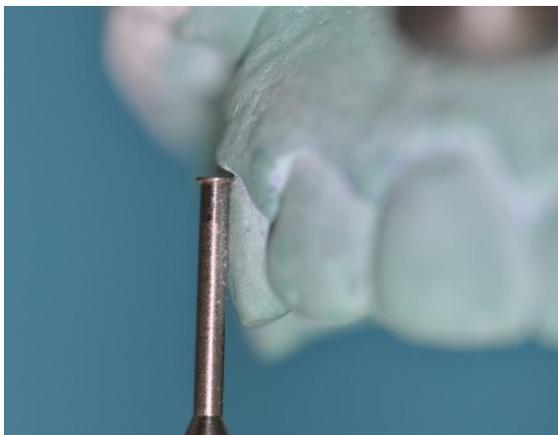


Fig 2: Pre operative model showing lack retentive undercut with 13.



Fig 3: Pre operative intra oral image of 23 showing lack of retentive undercut.



Fig 4: pre operative model showing lack undercut in the region of 23.



Fig 5: Post-operative intra oral image of 13 showing retentive undercut.



Fig 6: Post operative model showing retentive undercut with 13.



Fig 7: Post-operative intra oral image of 23 showing retentive undercut.



Fig 8: Post operative model showing retentive undercut with 23.

DISCUSSION

Various techniques of creating artificial undercuts on abutment tooth have been described in literature. Most of these techniques involve invasion in enamel. Low survey lines compromise the positioning of retentive arm of direct retainers due to inadequate gingival-occlusal height of the undercut.

In the described technique, performing crown lengthening/ gingivectomy aid in achieving desired height of undercut without jeopardizing the enamel or dentine. Crown lengthening should not be done beyond cemento enamel junction. As it is surgically invasive procedure should be used cautiously in medically compromised patients.

SUMMARY

This is novena way of creating retentive undercut for removable prosthesis. In this technique retentive undercuts were created by performing crown lengthening procedure. Chief advantages of this technique includes: non invasion of enamel and dentine, reduced abrasion of the retentive undercut and clasp.

REFERENCES

1. Sherman Axinn. Preparation of retentive areas for clasps in enamel. *J Prosthet Dent.*, 1975; 34: 405-407.
2. O. L. Bezzon, M. G. C. Mattos, R. F. Ribero. Surveying removable partial dentures: the importance of guiding planes and path of insertion for stability. *J Prosthet Dent.*, 1997; 78: 412-18.
3. Ana Rafaela Luz de Aquino, Alessandra Oliveira Barreto, Luana Maria Martins de Aquino, Angele Maria Fernandes Ferreira, Adriana da Fonte Porto Carreiro. Longitudinal clinical evaluation of undercut areas and rest seats of abutment teeth in removable partial denture treatment. *Journal of Prosthodontics.*, 2011; 20: 639-42.
4. William L. Mccracken. Mouth preparations for partial dentures. *J Prosthet Dent.*, 1956; 6: 39-52.
5. Chandler HT, Brudvick JS, Fisher WT. Surveyed crowns. *J Prosthet Dent.*, 1973; 30: 775-80.
6. Rickne C. Scheid, Gabriela Weiss. *Woelfel's Dental Anatomy*. Ed 8; Lippincott Williams &Wilkins, 2012; 75: 88.
7. Alan B. Carr, Glen P. McGivney, David T. Brown. *McCracken's Removable Partial Prosthodontics*. Ed 11; St Louis Elsevier, 2005; 214.
8. Rodney D. Phoenix, David R. Cagna, Charles F. DeFreest. *Stewart's Clinical Removable Partial Prosthodontics*. Ed 4; Quintessence, 2008; 291.
9. Krikos AA. Artificial undercuts for teeth which have unfavorable shapes for clasping. *J Prosthet Dent.*, 1969; 22: 301-6.
10. Louis Schorr, Lawrence H. Clayman. Reshaping abutment teeth for reception of Partial denture clasps. *J Prosthet Dent.*, 1954; 4: 625-33.
11. Ana Cla'udia Pavarina, Ana Lucia Machado, Carlos Eduardo Vergani, Eunice Teresinha Giampaolo. Preparation of composite retentive areas for removable partial denture retainers. *J Prosthet Dent.*, 2002; 88: 218-20.
12. Mohamad M. Hamirudin Michael J. Barsby. The Abrasion of Dental Composite by Cobalt-Chromium Clasps. *Eur. J. Prosthodont. Rest. Dent.*, 2007; 15(1): 13-18.