



## A Simplified Technique to Fabricate Chair Side Tooth Reduction Guide

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### Abstract

Adequate tooth reduction is a prerequisite for function, esthetics, and longevity for any fixed dental prosthesis. Insufficient or over tooth reduction may compromise the prosthesis in all aforementioned objectives. A tooth reduction guide may be useful for evaluating the sufficient tooth reduction to receive crown and bridges. This article describes a simple and cost effective technique for an accurate evaluation of tooth reduction for fixed restorations by using alginate matrix in conjunction with silicone putty index template and sticky wax.

**Keywords:** Tooth Reduction Guide; Alginate Matrix; Silicone Putty Index Template

### Introduction

One of the basic tenets of restorative dentistry is to conserve as much tooth structure as possible consistent with the mechanical and esthetic principles of tooth preparation. Tooth preparation should be ideal, to ensure uniform reduction and sufficient clearance and to allow adequate thickness of the final restoration, without impairing periodontal health, esthetics, and structural durability [1-4]. Most of the clinicians and undergraduates neophytes are familiar with the indicated amount of reduction as described in textbooks, but the difficulty is in actually achieving the stated amount of reduction<sup>5</sup>. Tooth preparation for complete cast restorations is a routine clinical procedure performed intra-orally before making the final impression. Tooth preparation for crown and fixed partial denture requires sufficient reduction as well as single path of insertion.

Depth groove technique [6,7] and silicone putty index technique [8] are most commonly used technique to evaluate chair side reduction of teeth in the mouth arbitrarily but it does not measure quantitative tooth reduction and most of the institute following these techniques. Oh., *et al.* [9] described a technique of tooth reduction guide using silicone registration material along with vacuum-formed thermoplastic matrix.

This article describes a technique to fabricate a tooth reduction guide, for the accurate evaluation of sufficient tooth reduction for fixed restorations. This technique demonstrates the chair side fabrication of tooth reduction guide, consisting of alginate matrix in conjunction with silicone putty index template and sticky wax.

### Technique

1. Fabricate the silicone putty index (Exaflex® GC America Inc., USA) over the waxed up diagnostic cast as seen in figure 1.
2. Initiate the tooth preparation and visually evaluate the amount of axial reduction and occlusal clearance with the use of silicone putty index. After approximate tooth reduction is done as seen in figure 2, the same putty index is used for making impression of the prepared teeth by using alginate impression material (Cavex CA 37, Holland BV, Netherlands) as seen in figure 3.
3. Remove the index with alginate attached, and then the sticky wax is melted with a gas flame and poured in to the alginate matrix (Kemdent, UK) as seen in figure 4.
4. Remove the cast with alginate attached to it and measure the axial and occlusal reduction at different level by using William's probe (Hu-Friedy Mfg. Co., LLC) as seen in figure 5.

- Identify the area where there is inadequate tooth reduction, mark it with a lead pencil, and modify the tooth preparations indicated.



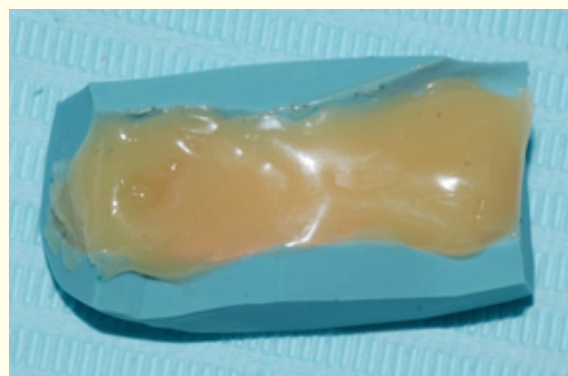
**Figure 1:** Fabrication of silicone putty index template.



**Figure 2:** Evaluation of approximate tooth reduction.



**Figure 3:** Impression made by using alginate impression material with the help of silicone putty index template.



**Figure 4:** Pouring of impression using molten sticky wax.



**Figure 5:** Measurement of axial and occlusal reduction at different level by using William's probe.

### Discussion

A technique to fabricate chair side tooth reduction guide, using alginate matrix in conjunction with silicone putty index template and sticky wax, has been presented. The main objectives of using alginate as a matrix fabrication are its snap-set behavior; extremely tear resistance, strong, less working/setting time and excellent dimensional stability, so that it can be used deliberately chair side and the same time achieve excellent result [10]. The silicone putty index, as a template, has dual purpose in this technique a) first, it allows fabrication of alginate matrix and b) the same time allows fabrication of temporary restoration by using direct technique, after the tooth preparation is completed. Oh, *et al.* [9] used PVS silicone bite registration material for matrix fabrication and vacuum formed thermoplastic template but author has found this technique to be expensive and sensitive, little extra pressure

by caliper may give false reading. The present technique allows rigid sticky wax base so it can be probed without any distortion using William's Probe. The advantages of using sticky wax are, highly tenacious (strong), hard, fast-setting, very adhesive, flows easily, sets firmly, rigid at room temperature and shrinkage not more than 0.5% from 43oC to 28oC [11]. The rigid base can be made up of gypsum products in laboratory, since over 75% of the expansion is observed at 24 hours during the first hour of setting [12] and because of its more setting time, author has used sticky wax keeping in mind the physical properties of the material.

### Summary

A technique to fabricate chair side tooth reduction guide, using alginate matrix in conjunction with silicone putty index template and sticky wax, has been presented. The main advantages of this technique are accurate, time saving, cost effective and less tedious.

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### Bibliography

1. Douglas RD and Przybylska M. "Predicting porcelain thickness required for dental shade matches". *Journal of Prosthetic Dentistry* 82.2 (1999): 143-149.
2. Kohal RJ., *et al.* "Effect of different crown contours on periodontal health in dogs. Clinical results". *Journal of Dentistry* 31.6 (2003): 407-413.
3. Wylie SG., *et al.* "Restoring the vertical dimension of mandibular incisors with bonded ceramic restorations". *Australian Dental Journal* 45.2 (2000): 91-96.
4. Rosenstiel SF, *et al.* "The complete cast crown preparation". 3<sup>rd</sup> Edition. Contemporary Fixed Prosthodontics. St. Louis: Mosby (2006): 202-215.
5. Beasley B. "Fixed Prosthodontics". 2<sup>nd</sup> Edition. Indian Health Service Dental Specialties Reference Guide. IHS Specialists: (2003): 22-23.
6. Preston JD. "Rational approach to tooth preparation for ceramometal restorations". *Dental Clinics of North America* 21.4 (1977): 683-698.
7. Miller L. "A clinician's interpretation of tooth preparations and the design of metal substructures for metal-ceramic restorations". In: McLean JW, editor: Dental Ceramics Proceedings of the First International Symposium on Ceramics. Chicago: Quintessence Publication Co (1983): 173-206.
8. Shillingburg HT., *et al.* "Fundamentals of fixed prosthodontics". In: 2<sup>nd</sup> edition: Chicago, IL: Quintessence Publishing Co Inc., (1981): 139-154.
9. Oh WS., *et al.* "Tooth reduction guide using silicone registration material along with vacuum-formed thermoplastic matrix". *Journal of Prosthodontics* 19.1 (2010): 81-83.
10. <http://www.js-davis.co.uk/uploads/brochures/423English.pdf>
11. Powers JM and Sakaguchi RL. "Waxes". 12<sup>th</sup> Edition. Craig's Restorative Dental Materials St. Louis: Mosby (2006): 354-355.
12. Powers JM and Sakaguchi RL. "Gypsum products and investments". 12<sup>th</sup> Edition. Craig's Restorative Dental Materials St. Louis: Mosby (2006): 318-323.

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