

# A Technique to facilitate the Conscientious Removal of Composite Resin Restoration

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## ABSTRACT

The use of composite resin restorations is widespread in restoring not only anterior teeth but also posterior teeth. Failure of such restorations can occur due to several reasons; and their removal is often stressful and time consuming due to their close resemblance to tooth structure. This article describes a simple technique to place composite restorations with the facilitation of easy demarcation from tooth structure if the need arises to remove it.

**Keywords:** Cavity volume preservation, Dentin–resin interphase, Failed composite filling, Opaque composite, Restoration replacement, Tooth restoration demarcation.

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## INTRODUCTION

Many people decide to replace their older silver amalgam restorations with newer “tooth-colored” composites. In the past, durability of composites was questionable, but with dental manufacturers making great strides in improving the strength of composite resin materials, they now have the versatility to be used for all teeth, including molars. Advantages, such as esthetics and tooth substance conserving techniques made resin composites a popular material in many cavity types, ranging from an initial to large replacement restorative material.<sup>1</sup>

Unfortunately, composite restorations do not last forever and at some point will require replacement due to reasons like recurrent caries, isthmus/bulk fracture, marginal degradation, incisal fracture, wear, marginal discoloration, and marginal fracture/degradation.<sup>2,3</sup>

The replacement of composite restorations often necessitates the total removal of the restoration with

rotary cutting instruments. Such a procedure can result in significant volumetric enlargement of the original prepared cavity because of the close shade match between the restoration and tooth structure.<sup>2</sup>

Millar et al<sup>4</sup> compared the original size and shape of class II cavity to the final size and shape after composite restoration removal. A significant increase in cavity size was seen, with a mean increase of 37% for the direct composite cavities and 35% for the indirect cavities. Following restoration removal, occlusal surfaces were seen to increase in 71% of teeth and proximal surfaces in 75% of teeth.

Removal of composite resin can be challenging, time consuming, and stressful to the dental practitioner. Several methods like disclosing agents and chemical softening agents were proposed to aid the practitioner to identify composite resin and facilitate its removal without damaging the adjacent healthy tooth tissues.<sup>2,5</sup>

The following technique will explain a simple technique in the placement of composite restorations that will facilitate the removal of the restoration if the necessity arises for its replacement.

## TECHNIQUE

- Isolate the tooth using rubber dam.
- Remove all caries, previous restorations, and friable tooth structure.
- Follow the basics of tooth preparation for composite restoration (Fig. 1).



Fig. 1: Class II cavity preparation

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Fig. 2: Application of opaque flowable composite



Fig. 3: Cavity lined with opaque composite

- Treat the prepared tooth for bonding. Any bonding system can be used following the manufacturer's instructions.
- Depending on the part of tooth being restored, a matrix might or might not need to be placed.
- Using a disposable composite cartridge tip or Dycal<sup>®</sup> applicator, line all the walls of the cavity with flowable opaque composite, restricting its application slightly short of the margins, if it is needed, for esthetic reasons (Figs 2 and 3).
- Finally, place the tooth shade matched composite restoration to fill the rest of the cavity. Composite can be inserted using an injection or with an instrument, in increments or as a bulk according to type of composite being used. After insertion and curing of the material, contour, finish, and polish the restoration.

## DISCUSSION

There is a widespread use of composite restorations even in posterior teeth. Despite the wide use of composite resin restorations and the advancement in composite resin materials, the survival rate of these restorations ranges between 3 and 10 years, with an annual failure rate of 0 to 9%.<sup>6</sup> Clinicians need to keep in mind while placing a composite restoration that the necessity might arise for the removal of this restoration, sooner or later.

As mentioned previously in the literature, removal of old composite restorations upon failure due to discoloration or fracture or the presence of new pathology is challenging, time consuming, and stressful due to the shade resemblance between the restoration and tooth structure. This can result in unintentional and unnecessary removal of extra tooth structure resulting in the enlargement of the cavity.<sup>2,4,5</sup>

The proposed technique recommends lining the cavity with flowable opaque composite before placing the shade-matched composite restoration. This layer of opaque composite between the tooth and its shade-matched composite restoration will act as a clear demarcation between the tooth and the restoration. When the restoration needs to be removed in the future, this demarcating line will enable the clinician to differentiate clearly between the tooth and the composite restoration, thus preventing the accidental unnecessary removal of healthy tooth structure. It was also noticed that on removal of the restoration not only did the cavity size not change much but also the time taken to remove the restoration was reduced since the clinician was more certain that he/she was still removing the restoration until the opaque layer appeared; and upon appearance of this layer, it was easy to demarcate between it and the tooth structure.

The use of flowable composite as a cavity liner decreases the microleakage of posterior packable composite, which is an additional advantage to the technique.<sup>7</sup>

For anterior teeth, the opaque layer may be kept slightly short of the margins to limit its influence on the shade.

Further expanded studies need to be conducted to confirm that the shade of the teeth will not be affected with the presence of the opaque layer, especially in high esthetic demanding zones. Studies also have to be conducted to test the efficacy of this technique for different levels of experience, ranging from students in preclinical laboratory set-ups to well-established consultants. Last but not the least, further studies have to be carried out to confirm that this technique limits the unwarranted removal of tooth structure while removing composite restorations, thus enabling limiting the size

of the cavity, post removal of the restorative material by different clinicians.

## REFERENCES

1. Van Dijken JW, Pallesen U. A randomized 10-year prospective follow-up of class II nanohybrid and conventional hybrid resin composite restorations. *J Adhes Dent* 2014 Dec;16(6):585-592.
2. Cruickshank EJ, Chadwick RG. Can chemical softening agents minimize cavity enlargement during removal of failed anterior resin composite restorations? *J Oral Rehabil* 1998 Mar;25(3):167-173.
3. Tyas MJ. Placement and replacement of restorations by selected practitioners. *Aust Dent J* 2005 Jun;50(2):81-89.
4. Millar BJ, Robinson PB, Davies BR. Effects of the removal of composite resin restorations on class II cavities. *Br Dent J* 1992 Oct;173(6):210-212.
5. Abdallah MN, Light N, Amin WM, Retrouvey JM, Cerruti M, Tamimi F. Development of a composite resin disclosing agent based on the understanding of tooth staining mechanisms. *J Dent* 2014 Jun;42(6):697-708.
6. Manhart J, Garcia-Godoy F, Hickel R. Direct posterior restorations: Clinical results and new developments. *Dent Clin North Am* 2002 Apr;46(2):303-339.
7. Alazzawi HJ, Alhyadi NA, Aldabbagh FJ. Microleakage of class II packable resin composite and resin modified glass ionomer cement: An *in vitro* study. *J Bagh Coll Dent* 2014;24(suppl 1):6-10.