



Tips for Preventing a Visible Fracture Line in a Class IV Composite



James H. Peyton, DDS, FAACD
Brian J. Gilbert, DDS, AAACD

Introduction

You have just finished restoring a complex Class IV fracture with composite, only to discover a visible fracture line. There is no disguising this error—the patient notices it immediately and others will eventually notice it, too. Even though you have achieved perfect anatomy, a great color match, and an excellent finish on the restoration, the final result is less than ideal. Unfortunately, this situation usually means the patient will have to return at another time to go through the process all over again. The patient is not happy and your profit for this treatment just evaporated. It is extremely important to make sure this does not happen again.

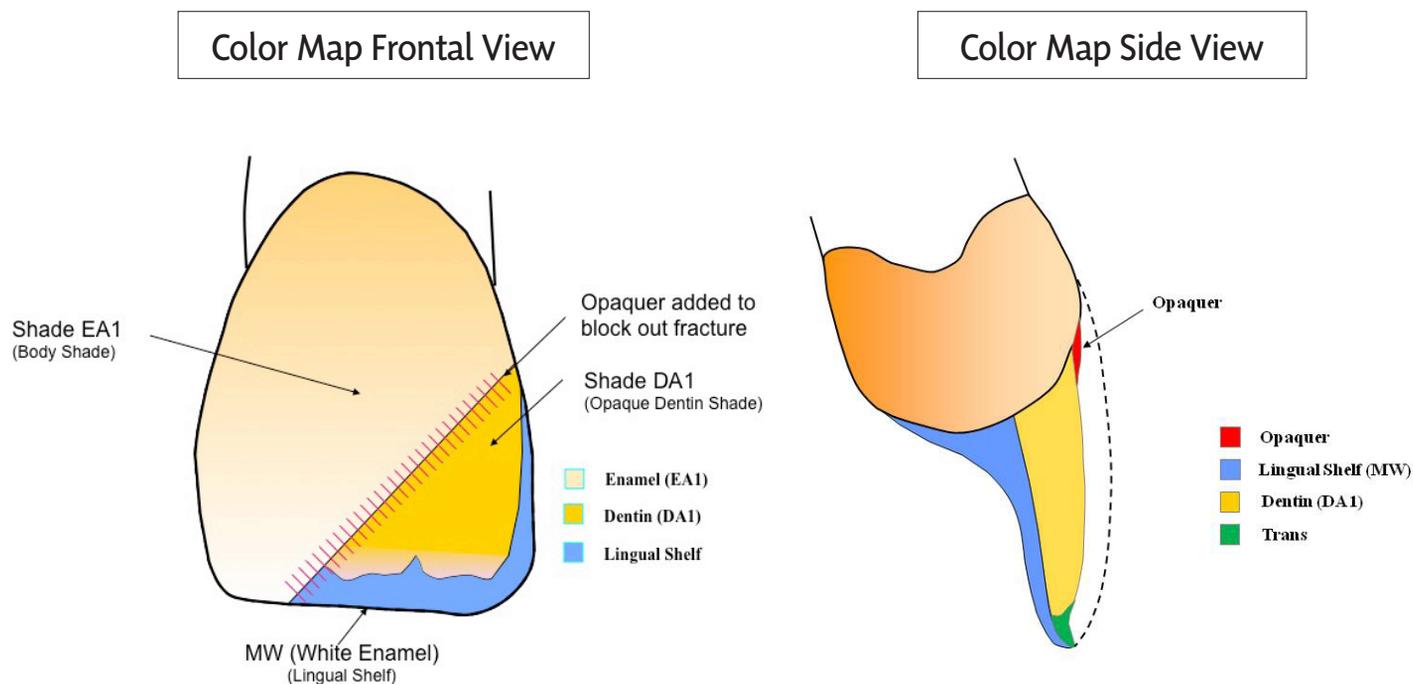


Figure 1: The frontal view color map shows the fracture line, the location of the dentin, and where to add an opaquer if necessary.

Figure 2: The side view color map shows the placement of the opaquer on the fracture line (usually right at the dentinoenamel junction).

Tips for Success

The key to eliminating a visible fracture line in the final restoration of a Class IV composite is to be absolutely certain that the fracture is no longer visible after the dentin shade of composite has been applied. Remember that the next layer of composite, the enamel shade, is slightly translucent. If there is an area of the fracture that is visible after the dentin layer is placed, the fracture will be visible in the final restoration.

When retreating a Class IV composite, typically the entire old restoration should be removed. Before removing it, make sure the lingual contour of the old restoration is ideal by reshaping and/or mock-up bonding the area and then make a quick putty matrix of the lingual surface of the tooth up to and including the incisal edge. Next, choose a dentin shade. Most composite restorative systems come with dentin shades. If there are no dentin shades, use an enamel body shade one to two chroma higher than the selected enamel shade. For example, if the enamel shade is A1, select A2 or A3 for the dentin shade (Figs 1 & 2).^{1,2}

III

The next step is to make sure to have a bevel on the facial that is long and deep (1.5 mm long from the dentinoenamel junction to the facial enamel surface). The bevel should be infinite; that is, it should have no visible edge. If there is a sharp edge on the facial enamel, it could result in a visible line in the composite. The bevel helps to blend the composite with the tooth and enhance the surface area of the enamel bond. Finally, a slight feathering of the edge of the bevel will also help in hiding any fracture line.

IV

Next, use the putty matrix to help create a lingual shelf of composite. The dentin shade selected earlier to replace the dentin of the natural tooth is very important. Add the dentin shade just slightly (approximately 0.5 mm) past the dentinoenamel junction.

V

After light-curing, check to see if a line is visible. If one does not appear, then there will not be a visible fracture line in the completed restoration. If a line exists, then either the dentin shade was incorrect (i.e., too translucent or not the correct value), or there was not enough volume/thickness of the dentin shade. If the dentin is correct in volume and placement, the clinician has two choices: start over with a different dentin shade or use an opaquer to blur the fracture line and make it disappear (e.g., Creative Color Opaquers [Cosmedent; Chicago, IL], Kolor Plus [Kerr; Orange, CA], or Estelite Color [Tokuyama Dental; Encinitas, CA]). To apply the opaquer, use a small brush (size 1, Art Store, Tokuyama, or Cosmedent) and add a small amount to the fracture area in incremental coats until the fracture disappears. Next, apply the enamel shade and finish and polish the restoration.^{4,5}

If these steps are followed the final results should be a Class IV restoration without any sign of a fracture line...and a happy patient (Figs 3-6).



Figure 3: After the dentin shade of composite was added there was a visible fracture line.



Figure 4: The opaquer was added to mask out or blur the visible fracture line.



Figure 5: The fracture line disappeared after the opaquer was added.



Figure 6: The finished restoration shows no evidence of a fracture line.

“The key to eliminating a visible fracture line in the final restoration of a Class IV composite is to be absolutely certain that the fracture is no longer visible after the dentin shade of composite has been applied.”

References

1. American Academy of Cosmetic Dentistry (AACD). A guide to Accreditation criteria. Madison (WI): AACD; 2014.
2. Fahl N. Step-by-step approaches for anterior direct restorative challenges: mastering composite artistry to create anterior masterpieces—part 2. *J Cosmetic Dent.* 2011 Winter;26(4):42-55.
3. Peyton, JH, Treatment of a Class IV anterior fracture: conservative direct composite restorations. *Dent Today.* 2017 Nov;36(11):110-3.
4. Manauta J, Salat A. Layers: an atlas of composite resin stratification. Milan: Quintessence Pub.; 2012; p. 183-235.
5. Finlay S. Stratification: an essential principle in understanding Class IV composite restorations. *J Cosmetic Dent.* 2012 Spring;28(1)32-4. **jCD**



Dr. Peyton is an AACD Accredited Fellow and has been an AACD Accreditation Examiner since 2000. A part-time instructor at the UCLA School of Dentistry, he practices in Bakersfield, California.



Dr. Gilbert is an AACD Accredited Member and an AACD Accreditation Examiner since 1998. He practices in Las Cruces, New Mexico.

Disclosures: The authors did not report any disclosures.

