

# Go with the flow: a cusp-by-cusp additive technique with injectable composite

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Traditionally, dentists tend to limit the use of flowable composites to small or non-load-bearing cavities, or use it as a liner or base. Alleged inferior mechanical properties are often mentioned as a reason that we are reluctant to use flowable composite for moderate to large cavities.

And that's a pity because a flowable consistency has many advantages: it's adapting well to the cavity walls and it has good handling properties. With current advancements in their development, it's time to shake off that reputation and embrace new restorative methods that make our lives much easier.

Some time ago, G-ænial Universal Injectable (GC) was introduced to the market, promising the same or even better strength and wear resistance as conventional composites. With advanced technologies, a high load of ultra-fine barium particles could be incorporated, while maintaining a low viscosity. The FSC-technology (full coverage silane coating) ensures that the particles remain strongly embedded in the matrix, resulting in an exceptional wear resistance. The first clinical studies with these types of flowable composites for posterior restorations, confirm their eligibility.<sup>1</sup>

Restoring entire cavities with a flowable or injectable composite requires a change of mindset. But when you take your time to familiarize with G-ænial Universal Injectable's thixotropic consistency, you'll notice that it's easy to apply without the need for modelling instruments. Its shape remains without slumping, but when a little pressure is applied, it

flows smoothly into every irregularity – a joy to work with!

In the following case, a second molar was restored with this composite. There was a carious lesion on the mesial side of tooth 27 and the old composite restoration that was still in place showed some marginal defects (Fig. 1). The decay and composite were removed, the teeth were isolated with rubber dam and a transparent sectional matrix and wedge were placed (Fig. 2). After a selective enamel etching and bonding protocol with a universal, two step adhesive system (G2-BOND Universal, GC) (Fig. 3), a separation ring was placed to compensate for the thickness of the matrix when restoring the contact point. The proximal wall was then built first with JE shade (Fig. 4) and the matrix and ring were removed. With the thin, bendable tip, the narrow and deep part of the Class II cavity could be easily reached. The cusps were built

up in small layers (Fig. 5). The first base layers at the bottom were made with a fibre-reinforced flowable composite (everX Flow) in Dentin shade. Next, the primary anatomy was laid using G-ænial Universal Injectable (shade A2) (Fig. 6). By injecting from the bottom up, following the existing anatomy, air bubble inclusion was avoided. The bases of the cusps did not touch each other, which left free surface for shrinkage, thus avoiding that shrinkage stress could build up. A tiny amount of brown stain was sparsely applied in the pits and fissures (Fig. 7) before layering the more translucent JE shade on top to enhance the perception of the occlusal morphology in a delicate way (Fig. 8-9). The cusps can be shaped simply by using the tip of the proper syringe, so no modelling instruments are used; it reminds of a wax-up technique, without the need to carve anything. This also makes it also a lot easier to switch between different shades than in a traditional



**Fig. 1:** A carious lesion was detected on the mesial side of tooth 27, requiring direct restorative treatment.



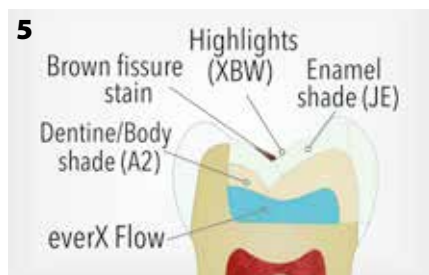
**Fig. 2:** After removal of the carious tissue and old restoration, the tooth was isolated and a sectional matrix and wedge were placed.



**Fig. 3:** The enamel margins were selectively etched prior to adhesive application.



**Fig. 4:** The mesial cavity wall was restored first (Shade JE), ensuring a tight contact.



**Fig. 5:** Build-up of the restoration

approach where you are working with paste and instruments.

G-aenial Universal Injectable gives a 'glazed' appearance with rounded and soft shapes, reminding of ceramics, with an easy-to clean surface (Fig. 10). At the follow-up appointment after one week, the remarkable gloss retention was again confirmed (Fig. 11).

### Conclusion

Dentists are always on the look-out for simplified approaches with less technique-sensitivity. In this regard, it is definitely worthwhile to familiarize with this new way of working – the easy manipulation of the thixotropic material grows on you and once you unleash its full potential, it will soon become your favourite! The cusp-by-cusp additive technique truly offers a high-quality restorative option for a variety of clinical applications.

### References

1. Kitasako Y, Sadr A, Burrow MF, Tagami J. Thirty-six month clinical evaluation of a highly filled flowable composite for direct posterior restorations. Aust Dent J. 2016 Sep;61(3):366-73. doi: 10.1111/adj.12387.



**Fig. 6:** The primary anatomy was created using a dentin shade (A2). The injectable composite was simply shaped using the application tip of the syringe.



**Fig. 7:** Some brown stain was sparsely applied in the fissures to enhance the 3D-appearance



**Fig. 8:** The enamel shade (JE) was layered on top. Some highlights were added on the cusps in shade XBW.



**Fig. 9:** Final secondary morphology. When applied with care, there is hardly any need to finish the restoration.



**Fig. 10:** Result immediately after treatment. Note that the teeth are still slightly dehydrated.



**Fig. 11:** Follow-up, one week after the treatment, with the inconspicuous restoration on tooth 27