Realizing efficient and predictable posterior quadrant restorations

Efficiency and long-lasting stability of the result are important requirements that are placed upon direct restorative procedures with composites. In this context, a system of well-coordinated materials is the definite key to success.

By Michael R. Sesemann, USA

It is not uncommon for middle-aged and older patients to present with multiple failing amalgam restorations in a single quadrant. Many such restorations can be replaced conservatively with direct composites. Unfortunately, however, many of the placement and accompanying adhesive protocols required for predictability can be time-consuming and technique sensitive. Therefore, it is important to understand the historical development of adhesive dentistry when considering today’s etching and adhesive protocol options.

In the beginning

Conceptualized more than 50 years ago, Buonocore proposed bonding to enamel and dentin by first treating those surfaces with phosphoric acid before applying resins. Although he considered resin tag formation in the micro-porosities of etched enamel to be principally responsible for adhesion to enamel, bonding to dentin was less predictable due to dentin’s composition, water content, and smear layer. Not surprisingly, collagen fibers from the dentin would create a less permeable surface for hydrophilic monomers in the adhesive, as well as a weak interface, potentially leading to a poor bond and postoperative sensitivity.

Although self-etching and clinically proven, total-etch adhesives and their associated multi-step techniques are often considered to be technique sensitive.

Selective-etch technique

With selective etching, only the enamel edges of the preparation are etched with phosphoric acid and then rinsed with water. The dentin is conditioned afterwards with either a primer or all-in-one self-etching adhesive; the smear layer is only modified, not removed by rinsing with water after primer application. This over-etching of the dentin could result in reduced bond strength and postoperative sensitivity.

Self-etch technique

Intended for adhesive bonding without separate etching, the self-etch technique relies on adhesive materials containing acidic monomers that etch and prime enamel and dentin. Although wellestablished and clinically proven, total-etch adhesives and their associated multi-step techniques are considered to be technique sensitive.

Realizing predictable efficiency today

Manufacturers have successfully increased the adhesive portfolio by introducing universal adhesives that promote high bond strength to enamel and dentin, and which can be used on both dry and moist dentin. Because they are designed to work with or without phosphoric acid, universal adhesives (Adhese Universal®) are suitable for selective-etch techniques, without fear of over-etching the dentin.

Materials of choice

When replacing multiple failing amalgam restorations in a single quadrant using direct composite, I prefer using the selective-etch technique because it delivers the “best of both worlds.” It provides strong micro-mechanical retention at the enamel margin with less probability of postoperative sensitivity, while the dentinal tubules are not completely opened.

My preferred adhesive for such techniques is Adhese Universal, which is available in traditional bottle and unique VivAfix® delivery. For me, the ergonomic, pen-like VivAfix design and angled brush cannula enhance comfort, control and speed during direct intraradical application while reducing material waste. Containing 2 milliliters of adhesive, the VivAfix can accommodate approximately 90 single-tooth applications, which is almost 3 times the applications per milliliter compared to conventional bottle delivery. As a result, the Adhese Universal VivAfix cost per application is considered to be lower than that of all other leading universal adhesives.

An important feature of VivAfix is the addition of a microparticle of bioactive glass to the composite. This microparticle, when mixed, releases calcium and phosphate. These ions diffuse into the enamel and dentin, thereby strengthening the tooth structure and increasing the longevity of the restorative.

Case presentation

A 59-year-old male patient presented with multiple failing amalgam restorations (teeth 14 through 17) that exhibited marginal leakage and required replacement (Fig. 1). Rubber dam isolation was established.

The restoration for tooth 17 was completed with a capping layer using Tetric EvoCeram Bulk Fill, which was smoothed with a modelling instrument designed for composite materials and light-cured for 20 seconds. Next, the restoration was contoured using a fine diamond and polished using discs and points. The cavity of tooth 14 was also conditioned with universal adhesive (Fig. 3). Then a single increment of Tetric EvoCeram Bulk Fill composite in shade A3V was placed, then light-cured for 40 seconds. The restoration for tooth 14 was completed with a capping layer using VivAfix (Fig. 4).

The restoration for tooth 16 was completed with a capping layer using Tetric EvoCeram Bulk Fill. The restoration for tooth 15 was completed with a capping layer using Tetric EvoCeram Bulk Fill.

The restoration for tooth 17 was completed with a capping layer using Tetric EvoCeram Bulk Fill. The restoration for tooth 16 was completed with a capping layer using Tetric EvoCeram Bulk Fill.

The restoration for tooth 15 was completed with a capping layer using Tetric EvoCeram Bulk Fill.
Clinical Endo Diploma Starting in Dubai with Fundamentals of Endodontics

By Dental Tribune MEA / CAPPmea

CAPP-Tipton Dental Academy and the British Academy of Restorative Dentistry (BARD) are launching the Clinical Endodontics Dentistry Certificate and Diploma programme in Dubai, UAE on 20 April 2017 with faculty lead Prof. James Pritchard, UK. The organiser will welcome 24 delegates from Bahrain, Hong Kong, India, Iran, Iraq, Oman, Pakistan, Saudi Arabia, Qatar and UAE for the first module which will take place in the CAPP Training Institute between 20-23 April 2017. The four days will cover “Fundamentals of contemporary endodontics” which will include “Understanding of instrument design and its effect on prevention of iatrogenic errors” and a hands-on training on “hand filing and lateral compaction techniques.”

The programme prepares the delegates to treat complex and challenging cases such as retreatment which have higher failure rates when performed by dentists who have not receive specialist training. The programme will employ several methods of delivering education.

The core of the course falls in to two areas of training: academic and hands-on training, skill enhancement with traditional and contemporary endodontic techniques. In the academic part, the education will be delivered via didactic lectures, seminars and student presentations.

This format would allow for delivery, assimilation and cementation of knowledge based on scientific evidence. In the hands-on training the delegates will be trained in accessing, shaping, irrigating and obturating techniques that are widely commercially available within the Middle East.

The structure of training will move students from learning classic hand-filing to contemporary hand-filing with NITI instruments and subsequently move onto rotary NITI and Reciprocating NITI. This will work hand in hand with learning classic obturation with cold techniques to thermal techniques and single cone technologies. Prof. James Pritchard as faculty lead brings with him a team of teachers with vast knowledge in Endodontics such as Prof. Paul Tipton from UK, Dr. Antonis Chaniotis from Greece, Prof. Edward Lynch from UK, Dr. Adam Toff from UK and Dr. Justin Dinley from UK.

The Certificate consists of three modules which will take place every three months. Each module is four days long. The course offers the participants a chance to obtain a Certificate in Clinical Endodontics from the British Academy of Restorative Dentistry (BARD). After a successful completion of the Certificate course, the participants will have the chance to sign up for the Diploma course which will lead to Post-Graduate Diploma in Clinical Endodontics from the British Academy of Restorative Dentistry (BARD). The Diploma consists of additional three modules which will take place every three months. Each module will be four days long.

After completion of the Diploma, there is an option for delegates to take the pathway to Masters in Clinical Dentistry (MClInDent) in Endodontology with City of London Dental School (CoLDS) and BPP University. Registration is now open for group 2 which will start later in 2017.

For more information about the programme visit: www.cappmea.com/capp-tipton

This is the second programme that CAPP-Tipton Dental Academy and the British Academy of Restorative Dentistry (BARD) have started in Dubai, UAE. There are two groups totaling 57 delegates already participating in the Restorative & Aesthetic Dentistry Diploma which started in 2016 and a third group starting in October 2017.

For more information about the programme visit: www.cappmea.com/capp-tipton