Restorative dentistry using the Isolite System

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Developments in dentistry have resulted in clinicians being able to offer patients dentistry using advanced techniques and materials. This has positively impacted the delivery of restorative care as well as care in other disciplines. Restorative materials are available with improved physical and aesthetic properties that more closely mimic the natural dentition as well as more advanced adhesive agents that contribute to clinical success and patient satisfaction.

An accurate preparation that considers the material selected for the final restoration is a key element of success, as are an accurate impression, accurate fabrication of the indirect restoration using a dental material with suitable physical characteristics, and appropriate selection and use of a luting agent.

An accurate impression is obtained using an advanced impression material or by taking a digital impression using a CAD/CAM system such as CEREC or E4D. In either case, an appropriate technique and isolation must be used. Clinically, isolation is important for restoration integrity at the time of placement, as well as short-term and long-term following placement. Without adequate isolation, restorations placed are at greater risk for microleakage and bond degradation due to salivary contamination.

Historically, a rubber dam and high volume evacuation (HVE) have been used to obtain excellent isolation and also reduce contaminated aerosols and spatter. However, in one review of rubber dam use by 229 dentists for 9890 consecutive restorations, 63% of the dentists did not use a rubber dam for restorative care and no rubber dam was used for 88% of restorations placed. Historically, cotton rolls and HVE also have been used.

More recently, the Isolite system has become available. This novel device serves several purposes, acting as a "5-in-1"—it functions as a bite block, cheek retractor, tongue retractor; acts as a suction device when attached to the operatory HVE; and has a 10,000 hour LED light with 5-levels of illumination plus cure-safe mode. The Isolite system's mouthpiece is available in multiple sizes, and has plastic flexible flanges buccally as well as palatally and lingually, providing for good simultaneous isolation of the upper and lower quadrants.

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The case shown demonstrates excellent isolation and visualisation using the Isolite system during restorative treatment.

Clinical Case

The patient, a 60-year-old woman, presented with old porcelain-fused-to-metal crowns with open margins, as well as failing composite restorations. Her chief complaints were sensitivity around the margins of the restorations and the fact that the crowns were yellow and did not match the colour of her teeth (Fig. 1). After a full examination and discussion with the patient, she was scheduled for treatment visits to replace these upper and lower restorations.

At the first treatment appointment, local anesthesia was administered together with a buffering agent that speeds up the onset of local anesthesia. The Isolite device was then placed in position (Figs. 2 and 3). The Isolite mouthpiece provides additional patient safety by obturating the

Figure 1. Pre-operative view




throat, minimising the chance of materials from entering the patient's airway. The defective crowns in teeth Nos. 14 and 15 were then removed and the preparation forms finalised (Fig. 4). Replacement composite resin restorations were completed in teeth Nos. 4 and 5 at the same visit. The expanded function assistant then packed gingival retraction cord and took digital impressions of the preparations in teeth Nos. 14 and 15 using an intra-oral camera, and the crowns were milled chairside using LAVA resin composite blocks (3M ESPE, Minneapolis, MN). The digitally designed crowns were tried in and the margins, occlusion, shape, and shade checked (Fig. 5). A pre-cementation radiograph was also taken to check the margins. The Isolite mouthpiece may be left in during imaging and is not affected by radiography process.

> *"In my experience, using Isolite increases efficiency by 30% to 50%."*

In my experience, using the Isolite device and having assistance from an expanded function assistant increases efficiency by 30% to 50%.

Given that almost all of the surface area to be bonded was in dentin, a self-etch, dual-cured bonding agent and dual-cured radiopaque resin-based adhesive luting agent were selected. The self-etch technique saves time, while one of the advantages of the luting agent selected is the ability to use a try-in paste for shade matching. After checking the shade matching, the sites were checked for any residual try-in paste before the bonding agent was applied as one coat, dried, and light-cured (Fig. 6). The selected shade of the dual-cured luting agent was then placed in the crowns, the crowns seated, and the cement cured. Two curing lights were used during each stage of the adhesive procedure, one buccally and one palatally, to speed up curing. The margins were checked for excess cement, and the occlusion was checked. The patient was very happy with the aesthetic results (Fig. 7).

Conclusion

In conclusion, advanced materials have enabled the provision of highly aesthetic bonded restorations while the use of the Isolite improved visualisation, provided the necessary isolation, and reduced chairside time for both the patient and the dental team.