Improved longevity and aesthetics in Class IV restorations

A clinical case involving Tetric N-Ceram and FRC Postec Plus from Ivoclar Vivadent

Dr Arun Rajpara
India

Traumas and injuries in anterior teeth are common in young people and those active in sports and other physical activities. Treating such injuries with predictable, conservative and natural looking restorations is of primary concern for aesthetically conscious dentists. A new generation of nano-composite restorative materials and adhesives is helping clinicians to place composite restorations in Class IV fractures conservatively. These materials provide restorations that closely resemble the form, function and aesthetic properties of natural teeth.

Many factors contribute to the appropriate design and material choice for the restoration of an anterior tooth, such as the patient’s age, occlusion, habits and aesthetic preferences. Laboratorially-fabricated restorations and chairside direct restorations offer unique advantages, which should be considered by both the patient and dentist.

This article presents a clinical case in which Tetric N-Ceram (Ivoclar Vivadent), a modern nano-composite resin restorative, was used in conjunction with FRC Postec Plus (also Ivoclar Vivadent), a glass-fibre-reinforced composite post, to achieve enhanced longevity, composite retention and superior aesthetics in an extensive Class IV restoration in a 15-year-old male patient. The young man presented with a large fracture of the right and left maxillary central incisors after a sports injury (Fig. 1). Intra-oral, peri-apical radiographic findings revealed pulp exposure. Immediate endodontic treatment was planned and completed in the same visit to relieve the patient of pain. In addition, impressions of both arches were taken to restore the patient’s smile line.

As the patient was young, the practitioner considered the patient’s aesthetic appearance to be of particular concern. Consequently, different treatment options such as direct and indirect restorations were discussed. After the models had been prepared, a diagnostic wax-up was created (Fig. 2) and a high viscosity, silicone putty matrix was prepared. The putty matrix, once placed in the patient’s mouth, was used for spatial reference as a volumetric, 3-D guide for the placement of the composite restoration and to preserve the facial/lingual line angles.

Treatment procedure

The patient opted for a restoration involving a direct composite layering technique and glass-fibre post placement for better composite retention. The composite shade was selected and a shade map for the layering technique was designed. In addition, the length and size of the glass-fibre post FRC Postec Plus were determined using post-operative, intra-oral radiographs.

The putty matrix was tried in the patient’s mouth for lingual and incisal fit. A bevel was prepared along the fracture line in the dentine using high-speed diamond burs and extended as a chamfer preparation on the palatal surface. A short bevel was prepared along the fracture line in the enamel on the labial surface and artificial composite layer, a subtle amount of Tetric N-Ceram in shade T was placed on the entire incisal shelf. A further thick layer, 1 to 1.5 mm of the same shade T, was placed on the entire incisal edge to create a halo effect in the incisal area of the final restoration.

The silicone putty matrix was removed, as the scaffolding had been prepared on the palatal and incisal morphology (Fig. 3). Tetric N-Ceram in dentine shade A 3.5 was placed on the entire fracture line. This opaque dentine layer helped to hide the demarcation line between the tooth surface and artificial composite resin restoration. After light-curing this layer, another substan- tial layer of dentine shade A 3.5 was applied in the shape of the natural dentine mamelons using OptraSculpt instruments (Ivoclar Vivadent) to replace the lost dentine structure in this area and light-cured (Fig. 4). Tetric N-Ceram in shade T was placed in a thin layer between the mamelons and spread evenly with the OptraSculpt tips and a single-use brush. After polymerising this layer, a subtle amount of Tetric Color in shade blue (Ivoclar Vivadent) was placed between the mamelons with a thin 0.8 mm endodontic file and spread evenly with a fine single-use brush.

After using 38% phosphoric acid was applied to the palatal chamfer (Fig. 5). Following this procedure, the root was prepared along the fracture line in the enamel on the labial surface and artificial composite layer pharmacologically VivaPen (Ivoclar Vivadent) was applied between the mamelons with a thin 0.8 mm endodontic file and spread evenly with a fine single-use brush.

The silicon putty matrix was removed, as the scaffolding had been prepared on the palatal and incisal morphology (Fig. 3). Tetric N-Ceram in dentine shade A 3.5 was placed on the entire fracture line. This opaque dentine layer helped to hide the demarcation line between the tooth surface and artificial composite resin restoration. After light-curing this layer, another substantial layer of dentine shade A 3.5 was applied in the shape of the natural dentine mamelons using OptraSculpt instruments (Ivoclar Vivadent) to replace the lost dentine structure in this area and light-cured (Fig. 4). Tetric N-Ceram in shade T was placed in a thin layer between the mamelons and spread evenly with the OptraSculpt tips and a single-use brush. After polymerising this layer, a subtle amount of Tetric Color in shade blue (Ivoclar Vivadent) was placed between the mamelons with a thin 0.8 mm endodontic file and spread evenly with a fine single-use brush.

The silicone putty matrix was removed, as the scaffolding had been prepared on the palatal and incisal morphology (Fig. 3). Tetric N-Ceram in dentine shade A 3.5 was placed on the entire fracture line. This opaque dentine layer helped to hide the demarcation line between the tooth surface and artificial composite resin restoration. After light-curing this layer, another substantial layer of dentine shade A 3.5 was applied in the shape of the natural dentine mamelons using OptraSculpt instruments (Ivoclar Vivadent) to replace the lost dentine structure in this area and light-cured (Fig. 4). Tetric N-Ceram in shade T was placed in a thin layer between the mamelons and spread evenly with the OptraSculpt tips and a single-use brush. After polymerising this layer, a subtle amount of Tetric Color in shade blue (Ivoclar Vivadent) was placed between the mamelons with a thin 0.8 mm endodontic file and spread evenly with a fine single-use brush.
Assurance

Invest in reliability. Focus on the patient. Express your style. From the people who build the most dependable dental equipment in the world, A-dec 200™ provides you with a complete system to secure a successful future.

Discover how you can gain assurance with A-dec 200. Contact your authorized A-dec dealer today.

For more information about A-dec, visit a-dec.com or contact your local dealer.
This material was polymerised for 20 seconds using the SOF mode of the bluephase to achieve incisal edge characterisation and natural translucency in the enamel area (Fig. 10). Tetric N-Ceram in enamel shade A1 was prepared in the shape of a ball and placed over the middle third area, spread evenly with OptiaSculpt and blended smoothly again using a single-use brush (Fig. 11). After light-curing the last layer, Tetric N-Ceram in shade T was prepared, placed in the centre of the labial surface, spread evenly and smoothed with the single-use brush (Fig. 12).

While contouring the last two layers, the mesial and distal line angles, as well as incisal margin were reconstructed. Furthermore, the practitioner took care of the contact points and embrasures. Final light-curing was performed on both the labial and palatal surfaces using the intensity programme of the bluephase C8 light for 20 seconds each time. Excess composite was removed with a #12 scalpel blade. The labial and palatal surfaces were contoured with medium-grit discs, diamond finishing burs and interproximal finishing strips. At this stage, special care was taken to preserve the contours and surface characteristics. Proper occlusion was verified in centric occlusion and excursive movements. Final finishing and polishing were achieved with the Astropol three-step finishing system (Ivoclar Vivadent). Astropol grey cups were used at slow speed with water-cooling to ensure an improved natural texture (Fig. 11). In the next step, Astropol green finishing points were used at slow speed with water-cooling for initial finishing (Fig. 14). Finally, the pink Astropol finishing cup was used at slow speed without water-cooling to impart a shiny lustre to the final restoration (Fig. 15). The final ultimate gloss on the restoration was achieved using Astrobrush (Ivoclar Vivadent) at slow speed (Fig. 16).

Conclusion

Traumatically damaged teeth can be restored effectively with beautiful and natural-looking restorations. In this case, good results were achieved by combining the excellent physical and aesthetic properties of the latest-generation nano-composite, Tetric N-Ceram, with an FRC Postec Plus glass-fibre post (Fig. 17). Proper planning by the clinician in selecting compatible materials and meticulous execution of the treatment plan yielded highly aesthetic results. The patient was amazed to see his beautiful smile restored in just a few hours.

A list of references is available from the publisher.

Mucopren® soft Delivers what it Promises.

Denture relining material with permanently soft A-silicone. Reliable, efficient and comfortable. Mucopren soft – a denture reliner of assured quality that has many advantages. Mucopren soft is guaranteed to bond to the denture base long-term, and its smooth, hydrophobic silicone surface makes it very difficult for bacteria to settle. A very promising material indeed! For further information please call +49 (0) 2774 70599 or visit our website: www.kettenbach.com.