the implants. A pick up impression is then taken as before. Case study 3 shows the technique where both teeth and implants are restored with crowns in the same arch (Figs. 24-34).

Conclusions

Whilst this technique of duralay bonnets requires two lots of impressions (two stages) and appears to increase the clinician’s time, the benefits of having excellent fit, occlusion etc. far outweigh the extra time taken.

Acknowledgements

I would like to thank the following for help with this series of articles:

- Dr Ibrahim Hassani, BDS, MMed.

With its versatile range of shades, IPS Empress® Direct meets all conceivable requirements that could be placed on an esthetic composite. Additionally, the material is characterized by an exceptionally low sensitivity to ambient light, affording dentists sufficient time to layer the composite and mould the restoration to give it a natural shape.

The case presented below provides an example of how an optimal restoration can be achieved with IPS Empress Direct.

Clinical case presentation

A 37-year-old female patient presented with fractured maxillary central incisors. Approximately one third of the mesial area was fractured on the incisors. The patient requested a fast and minimally invasive restoration of the broken teeth. She did not want healthy tooth structure to be cut, which meant that crown restorations were not an option.

A detailed clinical examination showed that the pulp of tooth 21 was exposed but the periodontal issues were undamaged (Fig. 1). After informing the patient of the treatment choices, we decided to perform endodontic treatment on tooth 21 and then reconstruct tooth 21 and 22 using a composite layering technique (IPS Empress Direct). A lingual sili-cone key would help in establishing the correct tooth shape.

A polarization filter assisted in evaluating the internal and external colour distribution of the natural teeth (Fig. 2). On the basis of the values measured and the natural tooth colour, we selected the appropriate shades for the restoration, including A2 and A3 for the dentin, A2 for the enamel as well as Trans 30, Trans Opal and suitable characterization shades.

To reconstruct the translucent enamel area, Trans 30 was mainly applied, while Trans Opal was mostly applied to imitate the structural features of the incisal edge. To ensure a high bond strength, I applied the total-etch technique using Tetric N-Bond®. In addition, I recommend using the OptrACLup® modelling instruments. Fillings can be shaped more easily – the OptrACLup Pad is particularly handy when contouring anterior restorations.

A rubber dam was applied to provide absolute isolation and adequately expose the tooth surfaces to be restored.

Step by step

With a minimally invasive technique, wave-shaped bevels were prepared on the teeth. This preparation design generally results in an increase in bond strength and enhances the intrinsic vibrancy of the restoration (Fig. 3). Once the teeth were prepared, 37 % phosphoric acid was applied. The bonding surfaces were etched for 20 seconds (Fig. 4). The adjacent teeth were covered with Teflon tape to prevent the phosphoric acid from coming in contact with them during the etching procedure. Subsequently, Tetric N-Bond was applied to the enamel surface and allowed to react for 10 seconds.

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As a result, the adhesive was able to evenly penetrate the enamel. Excess adhesive was then dispersed with compressed air. The resulting thin adhesive film was light-cured for 10 seconds using the High Power mode of the curing light (1,200 mW/cm², Bluephase N).

The layering procedure was begun by building up the lingual contours with the help of the silicone key. First, I applied IPS Empress Direct Enamel A3 followed by Tetric N-Flow (Fig. 5). It should be noted that Tetric N-Flow is particularly suitable for reconstructing the lingual anatomy. Once the lingual walls were rebuilt, the dentin and enamel areas were layered. IPS Empress Direct Dentin A2, Enamel A2, Trans 30 and Trans Opal were used for this part.

It is advisable to work from inside out – from the dentin towards the enamel – to facilitate the layering procedure. After light-curing the composite material, I contoured the restorations to give them a natural shape and created a textured enamel surface using a diamond bur. As a result, the restorations demonstrated a lifelike and vibrant appearance and faithfully reflected the optical properties of the natural teeth (Figs 6 to 8).

Finally, I polished the restoration to a natural looking gloss using the As-tropol® and Astrobrush® polishing sets (Fig. 9). Two weeks later, tooth 21 showed an undesirable change in shape.

We therefore decided to remodify the restoration. The retreatment resulted in a restoration that met the expectations of both the patient and my own (Fig. 10).

**Result**
A lifelike and functional restoration was achieved in the case presented above with the help of the IPS Empress Direct composite system, combined with solid dental skills. Six months after the placement, no imperfections or changes in shade or shape were noted – neither from the frontal nor from the lateral view (Figs 11 to 13). Even when evaluated with a polarization filter, the restoration met all the requirements (Fig. 14).

**Conclusion**
The case described above shows that healthy tooth structure can be protected and preserved by using minimally invasive technology, satisfying both the preferences of the patient and the requirements of the dentist. On balance, superior restorative outcomes can be accomplished.

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**Fig. 10:** Optimal result two weeks after placement of the restoration.

**Fig. 11:** Even six month after the placement, the restoration looked exceptionally lifelike.

**Fig. 12:** Viewed from the lateral, the texture of the restored tooth looks vibrant.

**Fig. 13:** The patient smiles with confidence.

**Fig. 14:** Restorations examined with a polarization filter: optimal results.

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