

The economic, conservative option

Accreditation Case Type 5

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Today's cosmetic dentist is able to offer much more than just indirect restorations to solve complex aesthetic problems. Accreditation Case Type 5 demonstrates that competence in Complex Resin Bonding is an essential skill for every dentist. Dr Arun Darbar, a laser dentistry aficionado, takes us through a case that we will certainly encounter more than once in our practising life.

Treatment Provided

- Composite resin restorations on 11 and 21
- Internal, home and power whitening
- Retreatment of 21 endodontics

Introduction and chief complaint

The main concern for the patient was the upper left central incisor, which appeared darker on photographs. As she was going to be a bridesmaid, this motivated her to do something about it. She had been given options to replace the old composites, and the endodontically treated, 21 appeared dark in colour. 11 also had a mesio-incisal composite

restoration. The patient's main concern was the 21, and she was happy with the remaining teeth for now saying that she would seek advice for the remaining teeth in time, as the urgency was the discoloured incisor.

Medical and dental history

Medically she was perfectly healthy. Her dental history included a childhood accident with a pushbike resulting in trauma to the incisors, necessitating root canal treatment to the 21 and composite restorations of both upper central incisors and a palatal amalgam plug on the 21. The 21 had discoloured over time. Periodontal health was reasonable

and well maintained. The patient was aware of occasional clenching but had no TMD related problems; she was also aware of malocclusion.

Diagnosis and treatment plan discussion

The options considered included amongst others whitening, veneers, and crowns. The possibility of orthodontic treatment was discussed, and as it was something she would consider at a later date, a very conservative approach, focusing on restoring and maintaining tooth anatomy, was deemed most suitable.

The root filling previously provided was adequate but lacked an



Figure 1: a-f – Full face views: Before (left) and after (right) images of the case

Figure 2: a-f – Anterior views: Before (left) and after (right) images of the case



effective seal and it was decided to re-treat in preparation for internal whitening, which would be followed by home and in-office whitening before replacement of the restoration with composite resin.

Treatment plan

- Oral hygiene appointments were to precede all other treatment and laser (laser curettage) used with the technique called 'PMPT' - Photo Modulated Periodontal Therapy.⁴ This stimulates repair

and regeneration and is used in pockets to remove soft plaque, reduce bacterial counts and bio stimulate gingival tissues.⁵ Physical removal of irritants including bacteria and calcified plaques from tooth and root

Figure 3: a-f – Further images: *Before (teft) and after (right) images of the case*



surfaces are facilitated by an ultrasonic scaler.⁶

- Re-treat upper left central incisor root canal
- Modify internal cavity seal with U-shape for internal whitening, follow up with home and power

whitening with Laser accelerated materials¹

- Replace the restoration with composite resin 2-3 weeks after whitening.^{6,7}

Treatment sequence and clinical stages

Once all the stages of treatment were explained and understood by the patient a number of upper and lower impressions were taken to fabricate study models and trays for

Figure 4: a-f – Anterior views: Before (left) and after (right) images of the case



whitening. A layering technique as described by Vanini² was going to be used to provide the restorations, so a diagnostic wax up of the two central incisors was done to fabricate a putty index as a guide for the final restorations.

Once the hygiene stages were completed, the root canal of the 21 was re-treated and a cavity was prepared for internal whitening about 1.5-2.0 mm below the CEJ with a U-shaped seal placed to enable the placement and aid the efficacy of the internal whitening material.

The internal whitening was carried out using a laser-accelerated product called 'White 10', which was made specifically as a targeted chromophore technique for this wavelength (810 nm). The peroxide gel was placed and the tooth irradiated at specific settings and

protocols as devised by the manufacturer etc. A small amount of gel and a cotton wool pellet was sealed into the cavity using a temporary filling material placed after completion of the first stage of in-office whitening. Before and after images were taken, and a remarkable difference was noticeable even at that stage.

The patient was dismissed for that day with instructions for the home whitening using 16% carbamide peroxide gel for 2 weeks, following which she would return for in-office power whitening. Following this, the access cavity on 21 was sealed but not bonded. The final appointment

to replace the 11 and 21 composite resins arrived and a rubber dam was placed to expose the six front teeth, 13-23, for colour matching.

No anaesthetic was used as the old composite was removed and the teeth were prepared using a hard tissue laser with different settings and protocols to achieve an enhanced bonding surface.⁸ Enamel margins were also bevelled with the laser using different settings and protocols. The teeth were etched with a buffered etch and seal (35% phosphoric acid), washed thoroughly, and a self-curing enamel / dentine bond was used in the cavity and on the root surface. The

materials used were Etch and Seal and Tenure A & B bonding system. The Putty matrix was then used to fabricate the core structure of the restorations.

The teeth were built up using the Vanani² layering technique and the first surfaces to be built up were the palatal surfaces and the incisal edges using a very thin layer of the enamel composite; in this case GE3 (a light colour) was chosen due to the patient's age. The subsequent layers were built up using UD3, UD2 and UD1 for internal dentine walls and incisal characteristics and markings were produced using IW (intensive white) OBN translucent

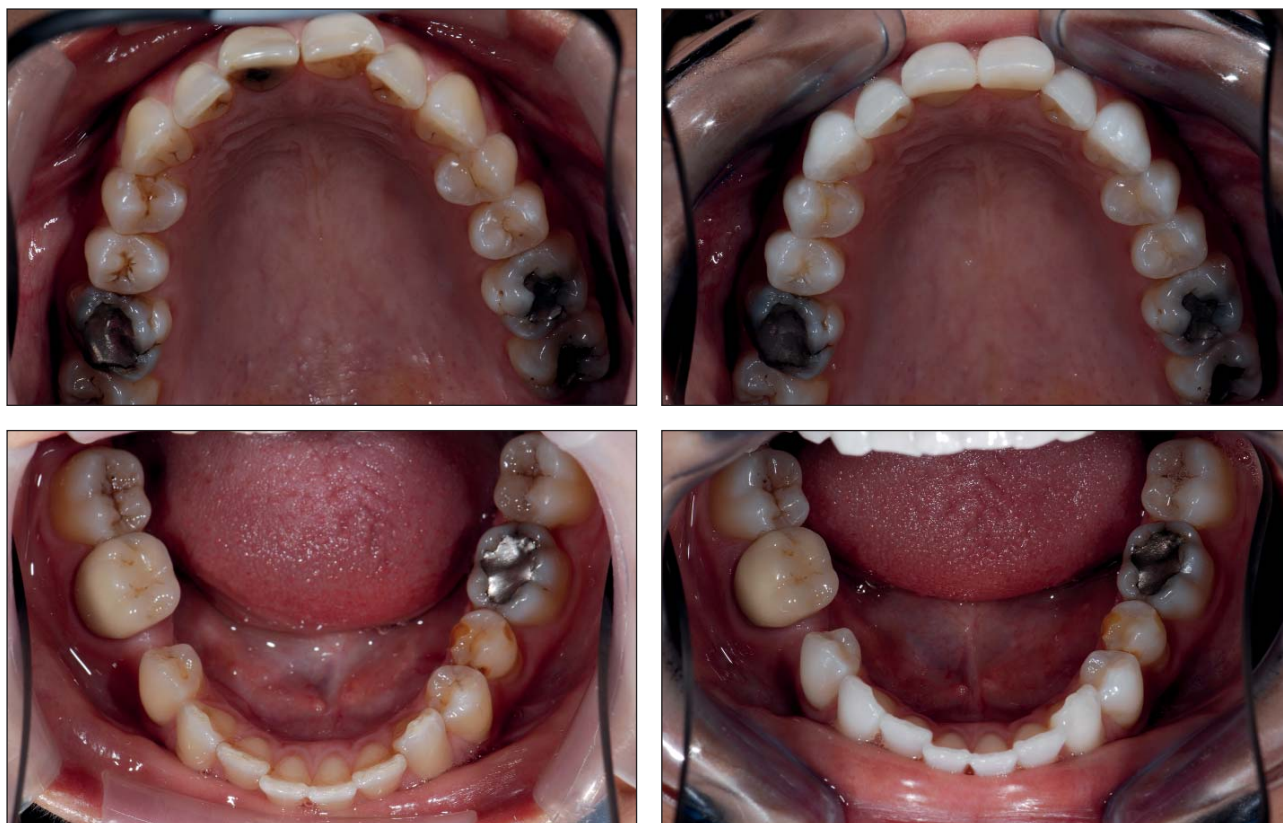


Figure 6: a-d – Upper and lower occlusal: Before (left) and after (right) images of the case

enamel with a blue tint. The two teeth were reconstructed in layers and at the same time, to keep the colour mapping easier.

Once the restorations were built up, they were refined and polished using different grades of polishing wheels, carbide burs and polishing discs. The finishing armamentarium included a jiffy brush and ABC polishing agents from the Enamel Plus Shiny Kit.

Armamentarium

- Nikon D200 with Macro and RIC flash system
- Various cheek and lip retractors and mirrors
- Digital x-ray system – Dexis
- Laser Systems – various hard and soft tissue lasers
 - Biolase MD hard and soft tissue laser
 - Laser Smile 810 Diode
 - Ezlase 940 Diode
 - LaserSmile bleaching H/P + Modifications
- Loops 4.8 magnification and surgical microscope.(Global)
- LED curing light
 - Instruments: Standard mirrors, tweezers, probes etc.
 - Composite placement instrument from Coltene
 - Perio probes, various color coded and measuring tips
 - Miller forceps and various articulating papers (colours, sizes and thickness)
- Composite material: Enamel Plus System Enamel Plus Shiny polishing system
- Bonding System: Tenure A+B, self-curing systems.u
- Standard rubber dam and accessories. ETC.

Conclusion

The patient was very happy that we had completed the treatment before her big day. We were also pleased about having the possibility to improve the final results with orthodontics and modifications without major reconstruction of any work already provided. Now we wait for the next stage.

References

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