

Dentistry Clinical

The discoloured central incisor: a minimally invasive approach for maximum aesthetics

By WAC speaker, Jason Smithson



Figure 2

Left: Figure 1



Figure 3



Figure 4



Figure 5



Figure 6



Figure 7



Figure 8

Background

Historically, discoloured endodontically-treated teeth in the aesthetic zone were treated with post crowns, usually with sub gingival margins. This is a very destructive approach for teeth, which are often already significantly compromised, particularly in very young patients.



Jason Smithson qualified at the Royal London Hospital in 1995. After spending three years in oral surgery residency in London, he relocated to Cornwall and is in general practice with a special interest in aesthetic and restorative dentistry. His specific interest is composite resin artistry and he has presented to dentists locally,

nationally and internationally on this topic. He recently achieved Diplomate Status in Restorative Dentistry from the Royal College of Surgeons. He is a full member of the British Academy of Cosmetic Dentistry and The Society for Advancement of Anaesthesia in Dentistry. In 2009, he was awarded the Pankey Scholarship.

This case report depicts a minimally invasive approach utilising internal bleaching and direct resin to achieve an aesthetically acceptable outcome in a patient in her early 20s.

Case report

History and examination findings: Claire is a 21-year-old student (Figure 1) who attended the practice having concerns about the appearance of her upper front teeth (Figures 2-5); in particular:

- 1) Both upper central incisors were discoloured; the left central being grey in hue whereas the right had a more orange discolouration.
- 2) The left central was fractured. This was as a result of trauma (bicycle accident as a child) and subsequent root canal therapy of the left central. The patient gave a history of the left central having been restored with composite resin on three previous occasions: all of which de-bonded in short order after placement.

Both teeth were currently asymptomatic.

The patient had recently obtained an opinion from another practitioner, who suggested a post crown and veneer as a treatment plan.

On examination:

- 1) Upper right central exhibited an orange discolouration (Figure 6), was not tender to pressure and tested positive

(although in the upper limits) to electronic pulp testing. Radiographically, there was evidence of sclerosis of the pulp chamber (Figure 7).

A diagnosis of calcific metamorphosis was made.

- 2) The upper left central showed a discolouration, which was more in the grey range, again the tooth was not tender to pressure and there were no obvious sinus tracts present.

An MID incisal edge fracture which exposed dentin was noted, alongside a palatal composite resin (Figure 8). A radiographic survey showed a well-condensed orthograde root canal filling which extended beyond the radiographic apex by some 2mm: there was no apparent apical pathology.

A diagnosis of discolouration secondary to endodontics and Ellis Class 2 dentin/enamel fracture was made. The loss in value of the left central incisor is particularly evident in black and white imaging (Figure 9).

Treatment plan

After a second opinion from a specialist endodontist, a decision was made to accept the existing root canal filling and only retreat if it became symptomatic. A conservative treatment plan of internally bleaching the teeth, followed by a direct composite restoration of the left central incisor, was discussed and agreed upon.

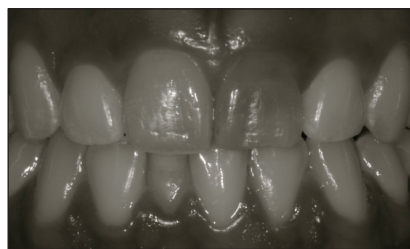


Figure 9

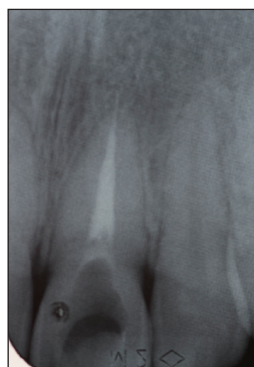


Figure 10



Figure 11



Figure 12

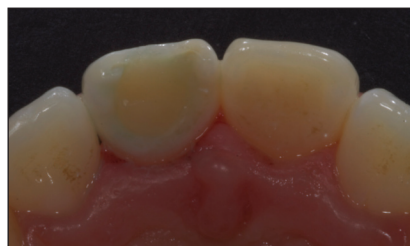


Figure 13



Figure 14



Figure 15



Figure 16



Figure 17



Figure 18



Figure 19



Figure 20



Figure 21

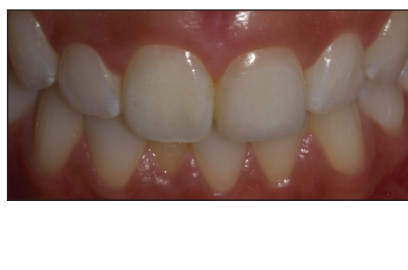


Figure 22



Figure 23



Figure 24

Therapy

Under local anaesthesia, the existing composite resin was removed from the left central, revealing a significant amount of gutta percha root filling material in the pulp chamber. This was cautiously removed to a level 3mm below the crestal height of bone and checked with a periodontal probe with reference to the incisal edge. The orifice was sealed with Fuji IX glass ionomer and verified radiographically (Figure 10). The smear layer was removed from the pulp chamber with EDTA and the chamber irrigated endosonically with hypochlorite for 15 minutes to remove pulpal debris from the dentin tubules (Figure 11).

The pulp chamber was left open and the patient instructed in the 'inside-outside' bleaching technique whereby the patient applies 10% carbamide to the pulp chamber and to the external of the tooth every two hours via a close fitting bleaching tray.

The patient returned two days later and a PTFE tape (Figure 12) was sealed into the pulp chamber with Fuji IX glass ionomer cement (Figure 13): both central incisors appeared to have significantly improved in appearance, although the left central still showed a small increase in chroma (Figure 14).

Impressions were taken and a diagnostic wax-up fabricated on casts of the teeth (Figure 15): from this, a

palatal stent was made in lab putty (Figure 16).

A period of two weeks was allowed for all of the oxygen by-products to dissipate.

The patient was recalled and the GIC/PTFE dressing was removed and the palatal access cavity restored with an opaque white composite resin (Figure 17).

The upper left central incisor was prepared with a small intra-enamel, supra-gingival 0.2mm infinity bevel on the facial surface, which was designed to mask the increased chroma of the discoloured tooth and create resistance form to retain the restoration. The ragged incisal edge was conservatively smoothed with discs. The palatal stent was offered up to the tooth to give an impression of the degree of build-up required.

The palatal contour was established with a thin layer of milky white semi-translucent composite resin, a dentin layer was built into this to establish mammelon outlines: at this stage the discolouration remained, particularly at the mesial aspect (Figure 18). The adverse chroma was masked with a flowable opaque composite and the final enamel layer placed (Figure 19).

The restoration was then contoured with discs, diamond finishing burs and finally with pumice on a goats hairbrush and 1 micron alumina paste on a cotton wheel (Figures 20-24).

The occlusion was checked in MIP and dynamic movements and the patient dismissed.

Conclusion

This minimally invasive approach achieved an aesthetic, life-like result for the patient at significantly reduced financial and biological cost to the patient.

Jason Smithson will be speaking at the 2011 World Aesthetic Congress (WAC), to be held between 17-18 June at the Business Design Centre in Islington, London. It will mark the 10th anniversary of WAC, the UK's leading aesthetic dentistry event, and will offer the whole dental team show-stopping clinical and business sessions, an unrivalled panel of speakers, and an outstanding exhibition with more than 70 leading dental companies. For more information or to book, visit www.independentseminars.com/wac.

