# Treating a discoloured tooth to match an otherwise unrestored dentition

## Accreditation Case Type 2
## (One or two indirect upper anterior restorations with natural teeth beside)

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## Introduction and patient's chief complaint

The patient was a 24-year-old dental nurse who had experienced trauma to her upper left central incisor as a teenager and which had been endodontically treated and restored with a large MI composite. There was discolouration evident in the remaining tooth structure and the patient was becoming increasingly self-conscious of her smile.

### Medical and dental history

There was no relevant medical history. The patient was a non-smoker and had a dental history of regular attendance, routine radiographs and hygiene visits. There was no history of TMJ clicks or muscle tenderness. A full examination was carried out covering hard and soft tissues. She had some posterior restorations present, good oral hygiene and good periodontal condition.

The patient's occlusion was symptomless; she was able to chew comfortably and there was no muscle tenderness on palpation. There was no evidence of parafunction and there appeared to be good disclusion posteriorly on excursions with no non-working interferences and canine guidance bilaterally. There were no signs of occlusal instability and the TMJ was assumed to be healthy.

## Diagnosis and treatment planning

The upper left central incisor was heavily restored and discoloured. Radiographically, there was a small periapical radiolucency present but this root treatment had been reviewed by Dundee Dental Hospital and deemed a healing area which was safe to restore. A full coronal seal was recommended. The patient was also having treatment at the dental hospital for tooth 26, which has undergone further treatment and was scheduled for a full coverage restoration once the Dental Hospital had discharged her.

Tooth 21 was also positioned lingual to 11, which the patient requested to be corrected. She also noted that she had previously had a slight space between her central incisors which was corrected with the restoration of 21 and she was keen to maintain the same appearance with the new restoration. In reality, this presented a challenge in keeping the facial widths of both centrals the same, even though the actual width of both varied by 0.2mm. It was decided that this could be overcome by careful

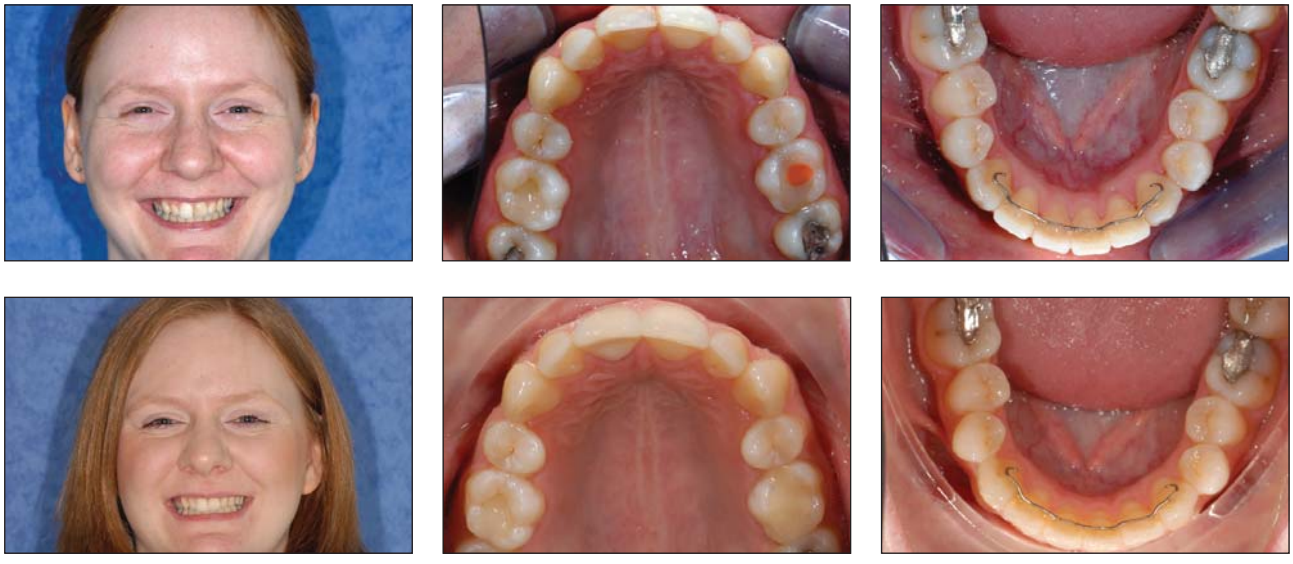
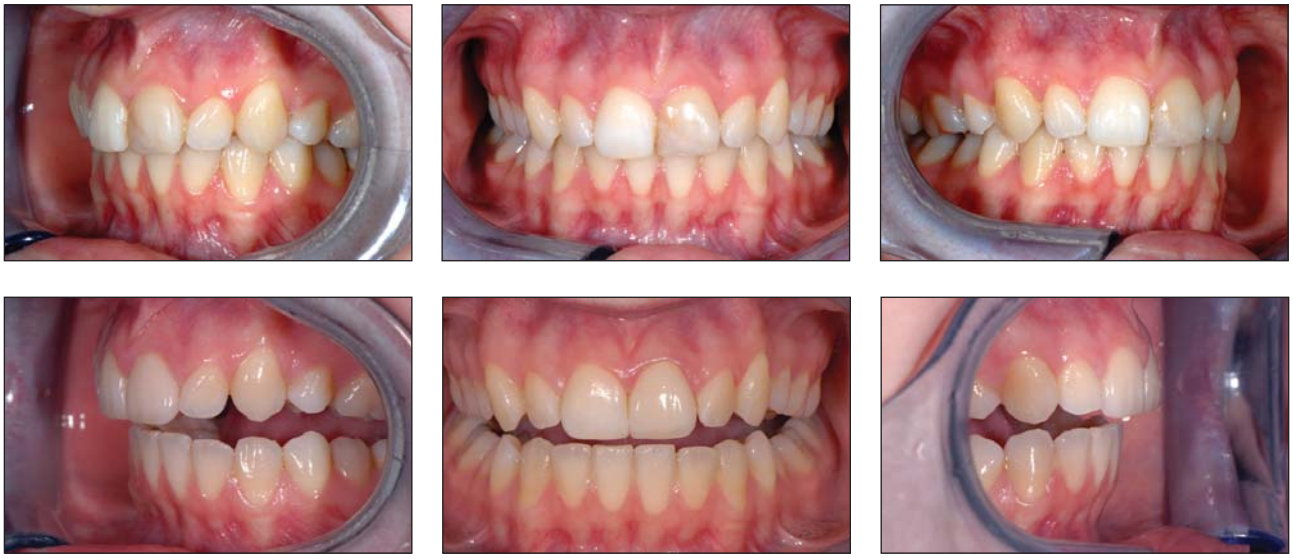


**Figure 1:** a-f – Full face. upper occlusal and lower occlusal: *Before (above) and after (below) images of the case*

**Figure 2:** a-f – Retracted: *Before (above) and after (below) images of the case*



shaping of the facial surface of the crown, and with direct bonding to the 11 mesially which was a virgin tooth.

## Clinical stages of treatment

The patient underwent a period of home whitening in custom trays for two weeks (Zoom) which was allowed to stabilise for four weeks before the tooth preparation was carried out. No anaesthetic was required for tooth preparation of 21 which was for a full coverage all-porcelain restoration.

The preparation was angled with the final desired position of the restoration in mind, i.e. less buccal preparation was required as the tooth would be built out in this area. A full arch impression was taken and a full arch opposing impression. The bite was recorded and the patient was sent to the laboratory for a custom shade.

The temporary was fabricated from an initial pre-op impression and was

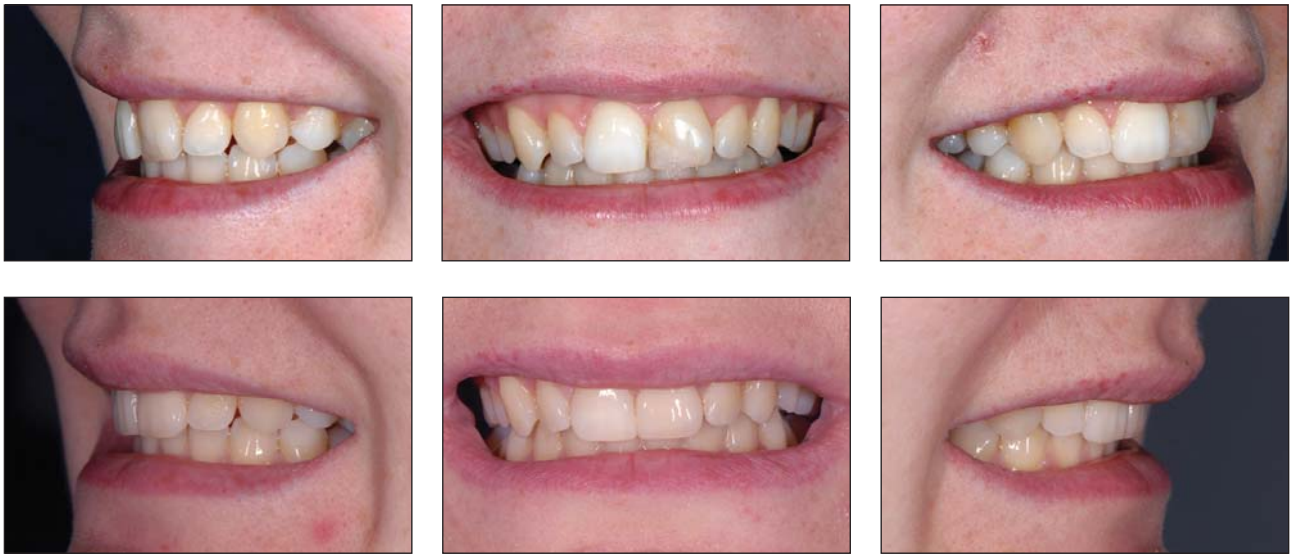


**Figure 3:** a-f – Smile: *Before (above) and after (below) images of the case*

then modified with flowable composite (luxaflow) to represent the new arch position. This final shape was communicated to the technician via an alginate of the temporary.

At a subsequent appointment, the temporary was removed and the crown was fitted with try-in paste. The value was deemed to be too low and so photographs were taken to illustrate this using the shade photography technique advocated by Ed McLaren (AACD San Diego, 2006) including keeping the shade tab in the same plane as the tooth and photographing it at a 90° angle.

The temporary was remade. When the patient returned, the value of the crown was a better match and the crown was cemented with Variolink (Ivoclar variolink) dual cure cement, excess removed and contacts polished with metal strips (Brassler). The mesial of 11 was then direct bonded with Miris dentine and enamel shades. This was polished with the Sofflex disc system and Brassler interdental strips.

## Conclusion

The main challenge in this case was matching a non-vital tooth to an otherwise unrestored dentition. This was overcome using careful laboratory communication including the use of high quality digital photography. The final restoration achieved improved aesthetics with natural looking colour and contour. The patient now has matching, natural central incisors without having had the need to remove excessive tooth tissue in preparation.

### Acknowledgement

I would like to thanks Luke Barnett, Technician for the laboratory work for this case.

### Further reading

- Chiche GJ, Pinault A. *Esthetics of Anterior Fixed Prosthodontics.*
- Fahl N. *Artistry – use of shade mapping to enhance laboratory communication – study manual.* Curitiba: Brazil, Jan 2006.
- Magne P, Belser U. Bonded porcelain restorations in the anterior dentition. *Quintessence Int.* 2002.

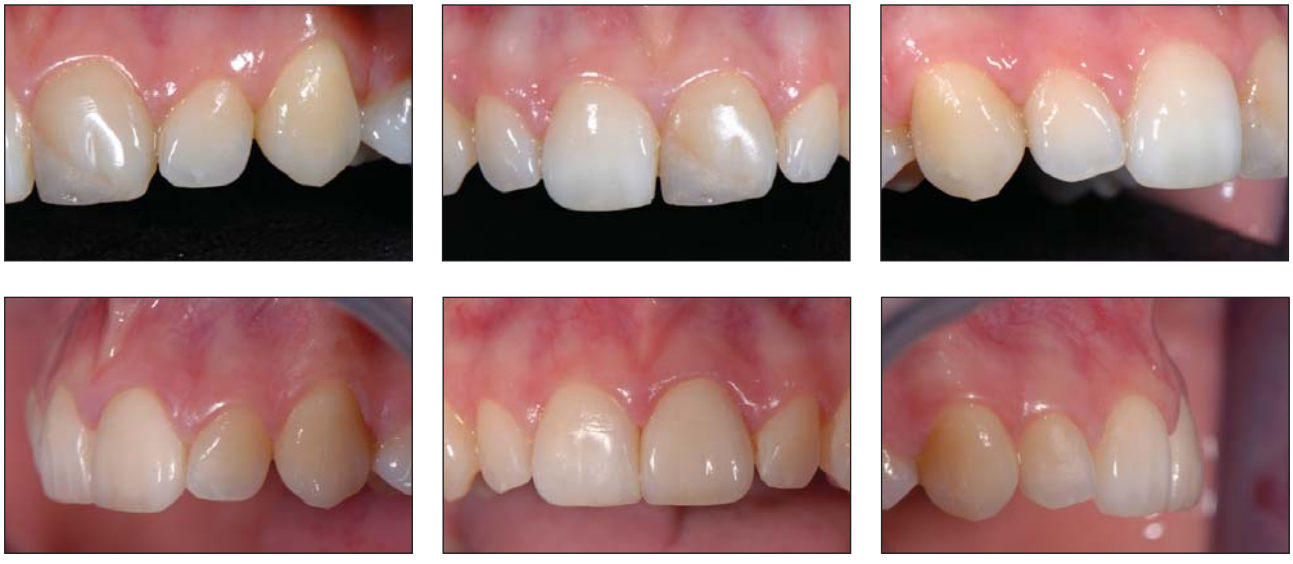


**Figure 5:** a-f – Anterior: *Before (above) and after (below) images of the case*