Single veneer on a lateral incisor

Accreditation Case Type 2

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Introduction

The patient was a 35-year-old female who presented with a dark upper right lateral incisor, which was soon successfully root treated.

She expressed her ideal wish was to have 'Hollywood' white-coloured teeth but that she would be happy with a light bright natural look.

As a single mother with two young children budget was a significant factor.

Medical and dental history

Medical

There was no clinically significant medical history.

Dental

Regular attender. Accident resulting in pulpal necrosis and subsequent root treatment in approximately 1991. No orthodontic work

Examination (inc. special tests):
Face/Head/Neck: No abnormality detected (Nad)
TMJ: Opening normal, mild lateral pterygoid tenderness on both sides on palapation. Prone to clenching and tension headaches when stressed
Soft Tissues: Nad
Periodontal condition: BPE 111/121 light lower anterior calculus build-up. Recession 33, 34 = 3mm; 43 = 2mm; 44 = 3mm; 45 = 2mm 46 = 3mm
Teeth: Sound
Wear: Light lower attrition

Appearance: Dislikes dark upper front tooth and would like whiter teeth – ideal 'Hollywood white' but happy with Vita 3d 1M1. Current shade Vita 3D 3R1.5

Smile Assessment: Full smile design assessment of the macro & micro anatomy of the teeth and their relation to the soft tissues and full face.

X-ray: Two Bitewing radiographs: Nad; one periapical: sound root canal treatment on 12

Diagnosis:
- Gingivitis associated with moderate lower calculus and infrequent interdental cleaning
- Unsatisfactory appearance due to discoloured upper left lateral incisor and yellow/grey teeth.

Treatment plan

- Consider internal bleaching or walking bleach the tooth considered too dark. If the tooth was bleached subsequent darkening of the tooth would be impossible to relighten
- Crown lengthening: Local anaesthetic to be given and biological width measured
- Restorative option: Composite bonding or a porcelain veneer placement was contraindicated due to their inability to mask the very dark discolouration. I chose to use a 'Cercon' Zirconia crown with e-max porcelain due to its ability to transmit light into the dark root while blocking out the stump colour. There was sufficient tooth present to avoid disturbing the root filling by placing a fibre-post and core.

Clinical stage description

Hygienist

The patient attended the hygienist to have a general scale and polish and oral hygiene instruction and especially to reinforce the importance of cleaning interdentally.

Crown lengthening

Local anaesthetic was placed labially and palatally (0.4ml Lignospan Special). The biological width was measured at 3.5mm allowing for 1mm of gingiva to be safely removed. This was carried out with an electro-surgery probe and the patient instructed to avoid brushing the area and to apply Corsodyl gel qds for 5 days.

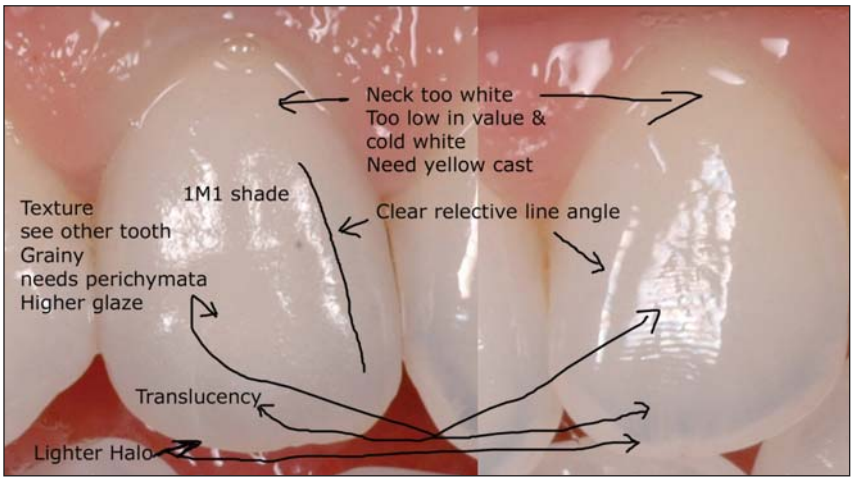
Home whitening

Impressions were taken for close fitting upper and lower bleaching trays in Zerosil.

The patient returned after one week for the tray fit to be checked and to be given verbal and written instructions and 15% carbamide peroxide gel to use in the trays 4-5 times a week overnight for 16 nights. The patient was reviewed after one week and all was going well. She was given more gel and was instructed to make an appointment for two weeks after she had completed the process, in order to review the colour.

At the review the colour was good but it was decided that a further eight nights of whitening would probably achieve her ideal colour for which four more tubes of gel were supplied and the colour again reviewed two weeks after

Figure 1: *An annotated image sent to the technician*



completion. We agreed that the colour was now very good and the patient booked for the crown preparation.

Crown preparation

Local anaesthetic was placed labially and palatally and the existing crown removed. There was sufficient tooth not to require fibrepost placement but the existing composite plug was replaced with UD1 HFO Dentine to lighten the stump colour. The margins were re-prepared to create a shoulder with a rounded internal line angle. The tooth was smoothed with a medium sandpaper disc and a white stone.

An impression was taken with Doric QuickTime putty and wash in two phases. Doric bite was taken and an opposing alginate. A temporary crown was made from a silicone template of the wax-up in A1 Quicktemp and cemented with non-eugenol temp bond. The patient was instructed to brush the restoration gently but meticulously around the margins and to apply Corsodyl gel after brushing twice a day.

Laboratory phase

Close fitting suckdown trays by Reatech Dental Laboratory were used together with Cercon Zirconia oxide coping 0.6mm finished 0.5mm short of the margin IPS e.max Ceram:

- Liner A2 and orange mix
- Margin powder A2 and yellow modifier

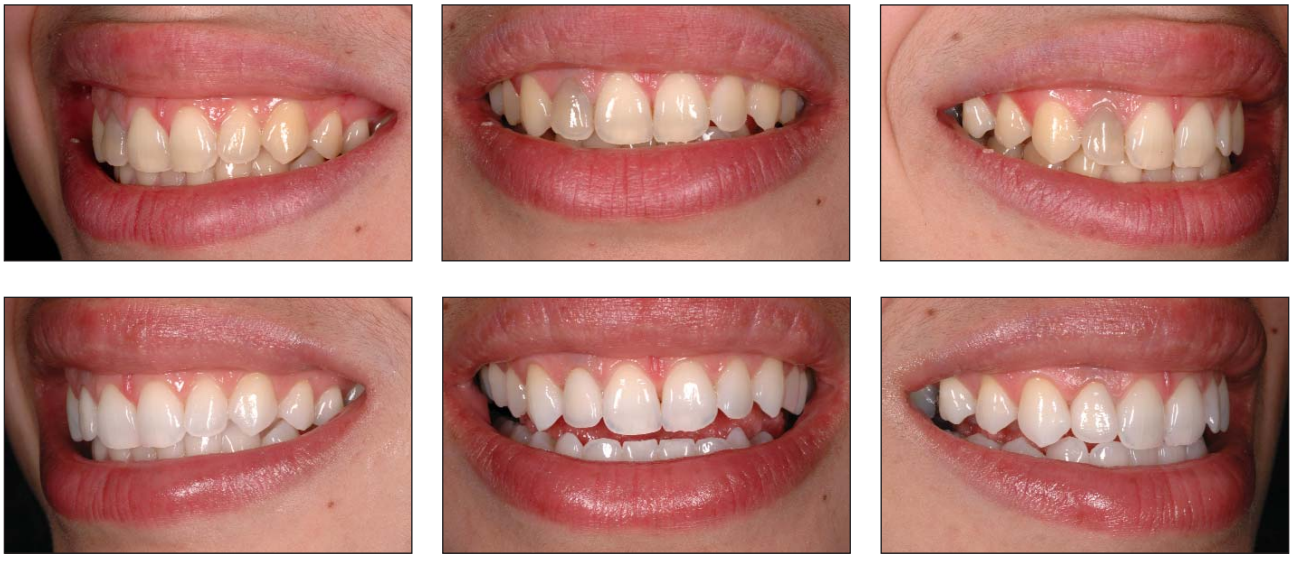


Figure 2a: a-f – Smile: *Before (above) and after (below) images of the case*

- (No deep dentine used)
- Dentine Bleach 3
- Enamel Opal1 (translucent) & Opal 2 (White opaque).

Laboratory

- Cercon scanning and milling by BB Ceramics
- E.max Ceram by Steve Rea at Reatech Dental Laboratory.

Try-in

The temporary crown was removed and the crown tried in with Variolink 2 transparent try-in gel. It was photographed and notes made of the improvements that could be made. An annotated photo (*Figure 1*) was sent to the technician. The crown was recemented.

Placement

The Cercon crown was tried in with Variolink 2 transparent try-in gel and the colour assessed using K5500 shade light. Confirmed colour match with patient. The crown was etched with 35% orthophosphoric acid, Monobond S silane primer was placed for one minute and then air dried. Excite bond was placed on the fit surface and air dried, and the crown filled with Variolink II transparent base. It was then kept under an orange light safe until the tooth was prepared.

The tooth was polished with pumice slurry to remove the residue of Temp Bond. Isolation was achieved with cotton wool rolls as gingival health had been maintained perfectly.

The tooth dentine was etched for 10 seconds (no enamel remained), washed for 15 seconds and air dried. Excite bond was worked into the dentine surface for 20 seconds with a micro-brush and air dried.

The crown was placed and flash cured for three seconds, gross excess was removed with a scaler and the contacts flossed. The tooth was then cured for 20 seconds labially and palatally. Glycerine gel was applied and the process repeated for 20 seconds at each embrasure labially and palatally (4x20 sec.). A 12 scalpel blade was used to run around the margins, then a fine enhance cup was used labially and palatally while holding the gingival tissues clear with a wards carver. The margins were smoothed with blue, green and a white interdental stip.

The tooth was polished with a rubber cup and diamond polishing paste and the occlusion checked with 12µm articulator film and the tooth felt for heavy contact. The patient was told to brush and floss normally and return for review in six weeks.

Conclusion

Zirconia oxide crowns are proving an excellent aesthetic option.
A Cercon based crown transmits approximately 50% of incident light providing a good compromise between the wish to block out a dark

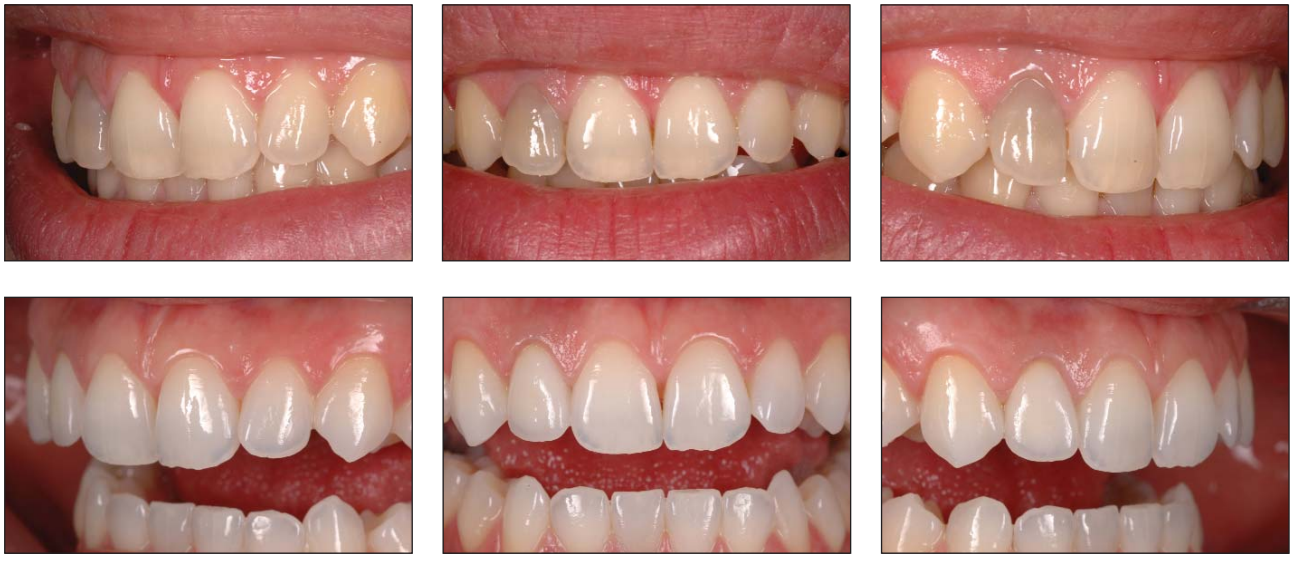


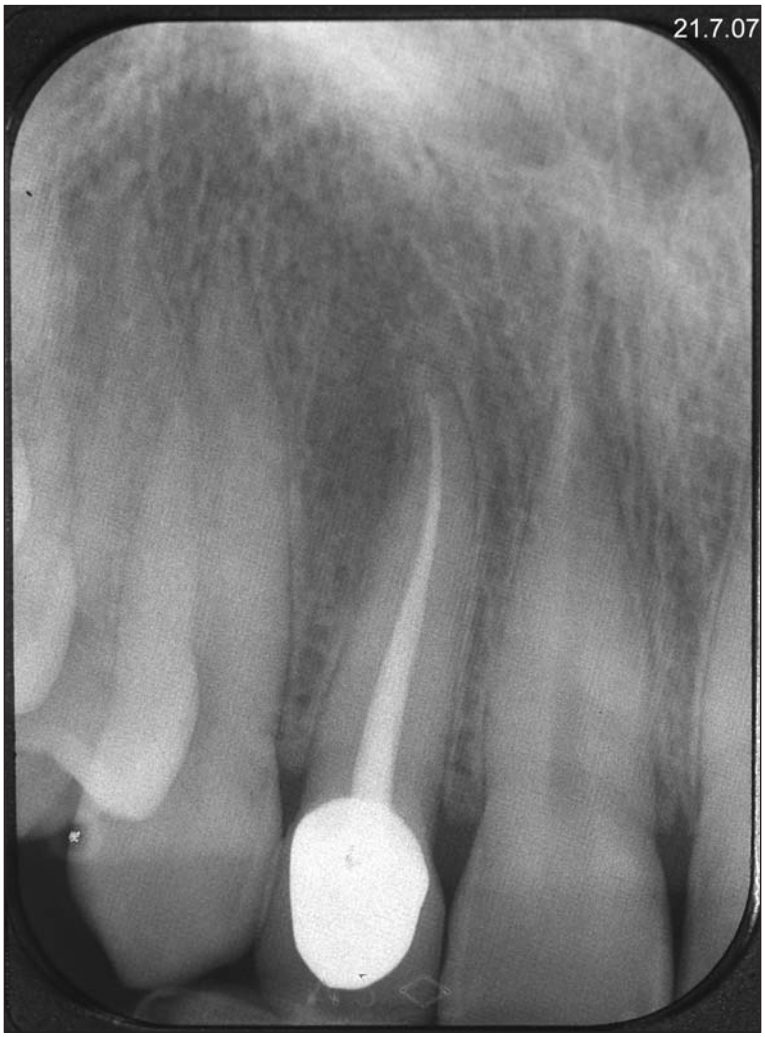
Figure 2b: a-f – *Before (above) and after (below) images of the case*

base colour and maintaining natural translucency

Armamentarium

- Nikon 70D camera with 1:1 macro lens, R2 close up kit
- Olympus C2500 camera illuminated with Panadent shade taking light
- 15% carbamine peroxide gel (Optident)
- Vita 3d shade guide
- Swan Morton 12 disposable scalpel blade
- Enhance polishing cup (Dentsply)
- Electro-surgery Unit (Eurodent)
- Occlussal Film 12 micro double sided
- Diaglaze
- Shofu Porcelain Polishing Kit
- Doric easy first (alginate substitute) (Schottlander)
- Doric Quick time putty with Fine Wash
- Unident Addition cured silicone putty
- Variolink II
- Ultra-etch 35% (Optident)

Figure 3: *Radiograph of the completed case*



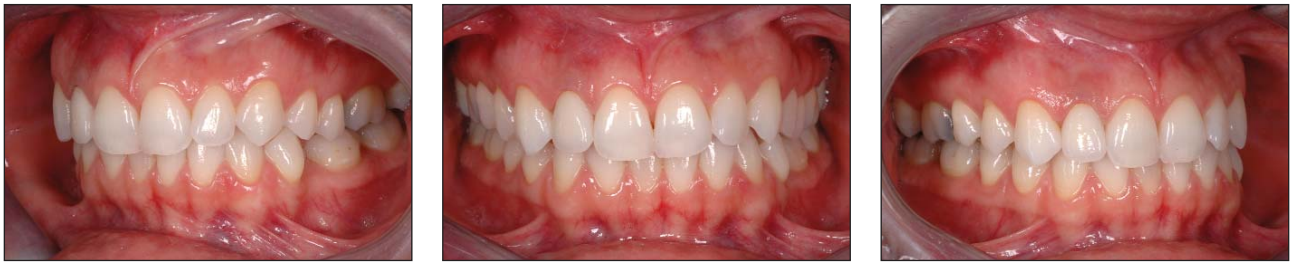


Figure 2c: a-c – Retracted: *After images of the case*

Figure 2d: a-b – Full face: *Before (above) and after (below) images of the case*

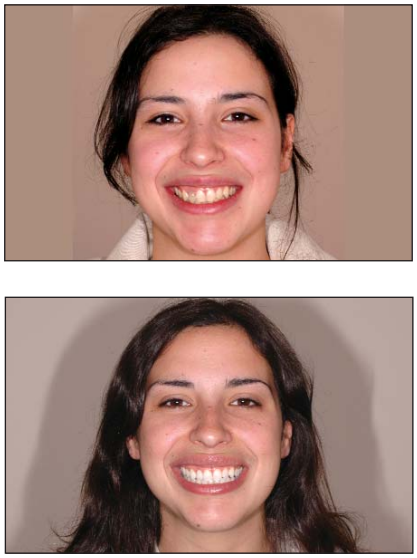
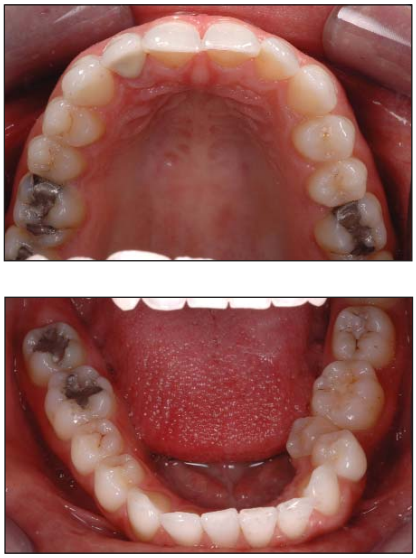


Figure 2e: a-b – upper occulsal and lower occulsal: *After images of the case*



- Glycerine gel
- Demitron light curing unit
- Komet Brasseler Bur 5368.314.023 TPS2-15 Lemon shape
- Komet Brasseler Bur 5368.314.023 TPS2-11 Rounded shoulder
- White stone
- Coarse Soflex disc by 3m
- Quicktemp A1
- Tempbond Non Eugenol
- Pumice
- Impression trays
- Zerosil (alginate substitute) (Dreve)
- Epitec abrasive strips: coarse, medium and fine
- Corsodyl chlorhexidine gel
- HFO UD1 composite from Optident
- Solo+ Bond
- Alginate.

Further reading

- AACD Smile design Manual
- AACD Photographic Guide
- Cercon Smart Ceramic Clinical Manual *Dr. med. Dent Sven Rinke, Hanau/Klein-Auheim Germany* Degudent
- Haywood V. Frequently asked questions about bleaching. *Rest Aesthetic Practice* 2004 **6:** 1.
- IPS e.max Ceram Oliver Brix Special e.dition by Ivoclar Vivadent 2006
- Kois JC. The restorative-periodontal interface: biological parameters. *Periodontology* 2000 1996 **11:** 29-38.
- Lee E, Jun SK. Achieving aesthetic excellence through an outcome-based restorative treatment rationale. *Pract Periodont Aesthet Dent* 2000 **12:** 641-648.
- Orr C. Dentics Clinical Training Programme, 2002
- Tarnow DP, Magner AW, Fletcher P. The effect of the distance from the contact point to the crest of bone on the presence or absence of the interproximal dental papilla. *J Periodontol* December 1992 **63:** 995-996.