BACD British Academy of Cosmetic Dentistry

BACD Foundation Dentist Case Presentation Award 2020

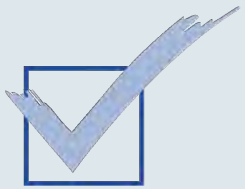
Entry 1

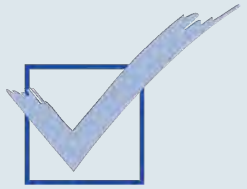
Patient details:
32 year old female patient presented at a general examination appointment unhappy with the discolouration of her Upper left deciduous canine (ULC). The tooth previously had been restored 4 years ago by her GDP, with gradual discolouration over time. Patient reported feeling embarrassed to smile in photos and having low confidence. Patient wanting to find out about options to restore her smile

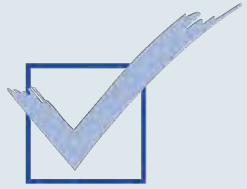
Occupation: Police Officer

Relevant medical history: Medically fit and well, No regular medications

Risk factor analysis:

Oral hygiene assessment: Good OH 

Smoking history: Non-smoker 

Caries/Periodontitis risk assessment: Low risk 

Intraoral examination:

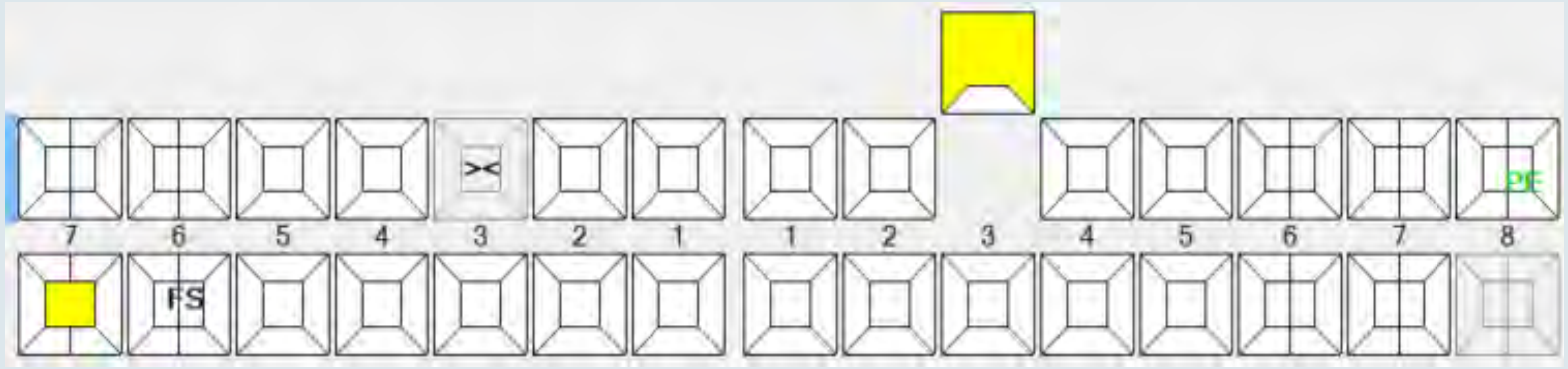
Periodontal assessment: BPE 010/020. Mild gingival inflammation around ULC with mild BOP and localised plaque build-up. Localised calculus build up interproximally lingually lower anterior.

Teeth: retained ULC. UR3 missing. Upper and lower 8's missing

Restorations: ULC with discoloured composite build up, LR7 with an occlusal composite otherwise unrestored dentition

Radiographic findings: LCPA showing UL2, ULC, UL4. ULC with shortened root height. 1:1 crown-root height.

Figure 1. Dental Chart



Aesthetic/Restorative assessment:

Figure 2.

Clinical characteristics	ULC
Marginal adaptation:	- Poor marginal adaptation to tooth surface, with roughness attracting plaque
Anatomical form:	- Zenith of ULC higher and broader than UR4 - Tooth torqued buccally, appears to protrude - LL3 tip quite prominent and little misaligned
Marginal staining:	- See figure 3
Occlusal assessment:	- Statically out of occlusion, with Left lateral excursion group function (4's and 5's)
Lustre:	- Loss of surface lustre, dull appearance of composite
Secondary caries:	- Nil

Figure 3.

Clinical Photos

Diagnosis and Management Options:-

Problem Diagnosed	Management option
1. Discoloured ULC	ULC composite build up
	Crown ULC - PFM - E.max
2. Missing UR3	Specialist Orthodontic referral, space opening for UR3 for symmetry, ULC XLA and Implant placement
3. Midline Shift	ULC XLA and gap replacement options - Removable - Fixed

Fig 4.
Communicating management options and assessing patient expectations using photographs from DSLR transferred to a tablet

Patient wanting most minimally invasive treatment, with least dental intervention. Hence decided to opt for replacement of ULC composite. Patient not bothered about Asymmetry or missing UR3

Care plan:

1. Oral hygiene instructions
2. Hyg [Scale and Polish]
3. ULC composite build up

Treatment:
(see figure 5)
We decided with the patient that the goal of the restoration was to both change colour and shape, whilst not wanting to prepare the tooth and preserve all sound tissue. This no preparation approach maximises biological preservation and provides a large area for a more optimal adhesion. I showed the patient the digital mock-up of the restoration (figure 4.2 and 4.3) whilst discussing the issues involved preventing us from restoring to ideal aesthetics (see figure 2.).

I decided to restore the tooth with the Ceram.x Spectra™ ST composites from Dentsply. The Evaluation of the tooth shade was made by using the VITA Scale guide. The shade selected was A2 with the corresponding composite shades Enamel A2 and Dentine D1 chosen. The OptraGate system was used to allow for effective, relative isolation of the treatment field. The patient refused Local anaesthetic, and the restoration was hence carried out without anaesthesia.

As a first step the old composite restoration was removed, revealing its natural shape. To allow for maximising biological preservation a UV light torch (395nm wavelength) was used to assist with removal of composite. The biofilm from the ULC was removed using oil free prophy paste and a rubber cup to prepare the tooth prior to restorative placement. A slight bevel was introduced to the margins of the restoration with a diamond bur and fast handpiece. The tooth surface was etched with 37% Phosphoric acid and bonding with 3M™ Scotchbond™ Universal Adhesive was used to increase the bonding forces in the enamel.

2 posterior sectional matrix bands were used vertically in the gingival sulcus to provide a guide to build the mesial and distal wall; with wooden wedges interdentally to stabilise the matrixes and improve the contour of the tooth. 0.5mm composite was used to build up the mesial and distal wall, followed by placing the sectional matrix horizontally palatally to build up the palatal wall.

The shell provided an outline of the rough outline of the final height of the restoration. The tooth was filled with D2 composite followed by a final layer of A1 composite. The matrixes were removed and final shape was refined with an extra fine (yellow) diamond bur. The final restoration immediately improved the patient's smile.

The Patient attended for a second appointment 2 weeks later to complete finishing and polishing; during which I had time to look at the current status of the restoration and plan changes to introduce further symmetry and improve aesthetics. The finishing was carried out with fine and extra fine finishing burs, in addition to red, orange, yellow and white polishing discs with polishing paste. See figure 6.

Figure 5. Workflow

Fig 5.1

Pre-op photo. The patients main complaint was the aesthetics of the ULC

Fig 5.2

Digitally overlaying smile design template to plan the changes to achieve an aesthetic smile. Ideally canine tip lower, with reduced disto-buccal surface.

(App used: Paint.net)

Fig 5.3

Digital mock up of aesthetic smile, mimicking the buccal surface of the opposing tooth

(App used: Paint.net)

Fig 5.4

Existing failing composite removed using a fast hand piece, using a UV light torch (395nm wavelength). Biofilm removed with oil free prophy paste and polishing brush

Fig 5.5

Composite build up using Ceram.x Spectra™ ST composites A2 and D1. Sectional matrix bands used to build mesial, distal and palatal wall. Free-hand build up, layered technique.

Fig 5.6

Adjustments planned for finishing and polishing

Fig 5.7

Post-op photo.

Immediately taken after finishing and polishing.

Figure 6. (Before and after – Smile)

Long term management/maintenance protocol

The initial high lustre of the composite does tend to be lost with time and superficial repolishing is needed at regular intervals. There is a risk of chipping though, unlike porcelain, this can be easily repaired intra-orally without complete replacement. Longer term, a cut back and resurfacing procedure can be carried out rather than complete replacement.

- Polishing 20 seconds with silicone impregnated brush.
- 3 micron diamond paste with goats hair brush – 20 seconds.
- 1 micron diamond paste 20 seconds with goat hair brush.
- Felt wheel and finish.

Reflection:

- The expected oral health benefit of the restoration is providing a smooth surface, to prevent the accumulation of plaque around the tooth.
- The Justification for the treatment was to improve the aesthetics of the tooth in shape and colour
- The treatment chosen allows for a simple, biologically preservative, relatively quick method to improve the aesthetics of the smile
- The maintenance of the restoration involves regular reviewing and polishing to prevent the failure of the restoration. The estimated prognosis for the restoration is 5-7 years. Upon failure, the restoration can be repaired adhesively or replaced. If the tooth fails, removable and fixed replacement options can be discussed.
- Challenges identified were being mindful of the short root of the ULC, with guarded prognosis and hence being mindful of not subjecting it to any lateral forces on excursion. Furthermore, being aware of tooth already being torqued buccally and not wanting the restoration to make the tooth look bulkier.
- Without anaesthesia, difficulty in adapting the composite apically. Ideally this would have been made easier with retraction cord/ PTFE in the sulcus. Compromise made in the apical adaptation by taking the composite short of the apical portion, and adapting the composite with a fine composite bur.

- On reflection, the mesio-buccal portion of the tooth exhibits some darkness. This is either a result of the incomplete removal of the discoloured portion of composite or a result of discolouration from localised bleeding/gingival crevicular fluid from the gingival sulcus after removal of the sectional matrix. Whilst building the mesial and distal shell initially, there was a lack of bond between the shell and tooth which lead to the shell being displaced from the tooth, hence requiring the sectional matrix to be replaced leading to localised bleeding from the sulcus. Ideally this would have been controlled by using a rubber dam inverted around the anterior teeth with floss ties apically to provide a more effective isolation around the tooth.
- During the finishing and polishing appointment, I was able to add a thin layer of composite to mask the small area of darkness, this improved aesthetics immediately.

- There is a colour difference between the tooth and restoration which can be attributed to dehydration during treatment, which would resolve upon hydration. Secondly, this can also be a result of an incorrect colour match to the tooth itself which is darker in comparison to the anterior teeth. To enhance the aesthetics, I could speak to the patient about teeth whitening to improve the colour match of the tooth to the adjacent teeth. Alternatively, this could be a result of trying to prevent the restoration looking bulky hence maintaining a thin buccal profile leading to poor transition surface. This can be addressed at the review appointment* by placing a thin layer of enamel composite on the buccal surface to allow for a more homogenous colour match.
- *At the review appointment, the patient was very happy with the colour match and the restoration was beyond her expectations. Hence it was decided to not make any drastic changes to improve colour match. Patient declined whitening.
- A further point of reflection would include further polishing at the junction of the line angles to introduce a smooth transition.