Clinical

Simple and effective restorations with Ceram.x Mono

Nick Barker presents the following case study where he considers the restorative care of a 39-year-old male patient who required endodontic treatment of his upper left first molar

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Introduction

This study illustrates the logical and easy-to-follow steps taken that allowed straightforward treatment provision and a stable end result. The logical steps ensure that the entire dental team can work effectively and efficiently, thus causing minimal stress to the team and patient alike.

Examination

This patient presented with a dull ache from his upper left first molar tooth (UL6). The pain was spread across the left hand side of his face. It had been present for around three days and had now progressed to the point where his UL6 was tender to bite on.

On examination there was no evidence of facial swelling, although there was mild tenderness to palpate the left submandibular lymph nodes.

Intra-orally, the soft tissues were generally healthy in appearance and there was no tenderness to palpate in the buccal sulcus beside UL6. However, the tooth was dark in colour with a large composite resin restoration present on its occlusal and distal aspects. Other than the discolouration, the restoration appeared sound with no evidence of carious activity. The tooth was tender on application of axial pressure but did not demonstrate anything more than physiological mobility. On radiographic examination, there was evidence of an existing endodontic treatment of the tooth that appeared to be reasonably condensed and at a good length in all three roots. However, there was evidence of periapical radiolucency on the palatal and mesio-buccal apices. On further questioning, the patient identified that the tooth had been somewhat symptomatic on a reasonably regular basis since the endodontic treatment had been carried out around 18 months previously.

The periodontal tissues were healthy with only small deposits of supra-gingival calculus and no bleeding on probing. Similarly, the occlusal scheme was in harmony with a stable intercuspal position and no interferences on any dynamic movement.

My diagnosis, therefore, was of a lesion of endodontic origin that was chronic with acute episodes occurring sporadically. The options given to the patient were endodontic retreatment or extraction of the tooth. The patient opted for retreatment.

Nick Barker BDS MSc qualified with honours from the Royal London Hospital in 1990 where he worked as house officer in prosthodontics before moving into general dental practice as an associate dentist. He became a principal dentist in 1994 and grew what was a two-surgery practice into what is currently a 12-surgery practice over three sites, working with a multitude of clinicians including associate dentists, foundation dentists, therapists, hygienists, trainee hygienists and extended duties dental nurses and radiographers.
He gained an MSc with distinction in restorative dental practice from UCL Eastman in 2009 and now accepts referrals for endodontics, restorative and implant dentistry. He also currently holds the positions of chair of the dental local professional network in Essex, postgraduate dental tutor at Colchester University Hospital, member of the English and UK councils and is on the General Dental Practice Committee board at the British Dental Association. He's a member of the Faculty of General Dental Practitioners at the Royal College of Surgeons of England and lectures widely across health education east of England on restorative dentistry and extended duties for dental nurses.

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Treatment

At an initial visit, the existing restoration was removed and the distal aspect rebuilt with composite resin to create a 'well' that would allow pooling of the irrigant materials to occur. Access to the root canal systems was gained by removal of the existing gutta percha. This was found to be in the form of a heated system (Thermafil). The surrounding gutta percha was, therefore, removed initially by softening with chloroform and removal using a mechanical file system (Protaper Universal). This then allowed removal of the plastic carrier, after which further cleaning of the root canal system was carried out using 2% sodium hypochlorite and a chelating agent (Glyde) along with agitation of the irrigants using an Endoactivator to encourage the irrigants to reach as much of the root canal system as possible. The roots were then dried and dressed with a non-setting calcium hydroxide powder and a glass ionomer cement (Fuji IX).

At the second visit, the symptoms had settled completely. Therefore, the root canals were again cleaned with a mechanical system under copious irrigation, similar to the initial visit, before being dried (Figure 1). They were then sealed using heated vertical condensation of gutta percha and sealant cement (Figure 2). The gutta percha was cut back to 2mm below the level of the canal orifice before the entire access cavity was treated with 37% phosphoric acid etchant gel that was washed away after 15 seconds. Dentine bonding agent (XP Bond, now known as Prime&Bond XP) was subsequently applied and cured for 10 seconds.

The distal aspect of the cavity was then reconstructed using Ceram.x Mono composite resin that was light cured for 20 seconds to convert the cavity from class II to class I. Following this, the base of the cavity was filled up in 4mm increments using SDR with each layer being cured for 20 seconds (Figure 3). Once this had been completed to 1mm below the level of the deepest aspect of the interdental ridges, each cusp was reconstructed using Ceram.x Mono, one at a time with each increment being 'tack cured' for five seconds before moving on to the next. This allows a rapid reconstruction of a harmonious occlusal anatomy, whilst simultaneously producing a surface that will require limited finishing and polishing.

The definitive occlusal anatomy was finally light cured for 20 seconds before being finished with Enhance discs and polished with Pogo discs (Figure 4). The final restoration was checked with articulating paper before the patient was provided with post-operative instructions.

Conclusion

In summary, this approach has allowed for simple, rapid and effective restoration of an infected tooth that now has a reasonable prognosis. The final steps will be to review the tooth to ensure a continued lack of symptoms before considering providing a cuspal-coverage restoration that may provide increased resistance to cuspal flexure and potential subsequent fracture. D

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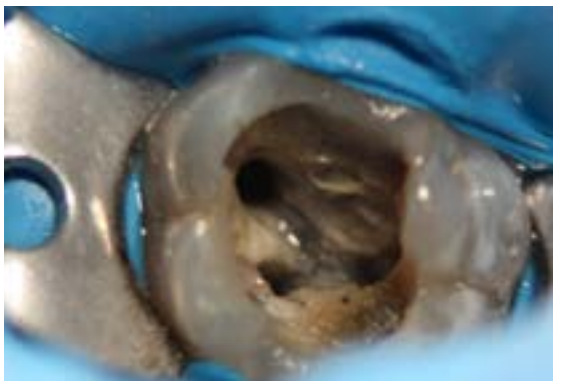

Figure 1: Root canals were cleaned with a mechanical system under copious irrigation and dried

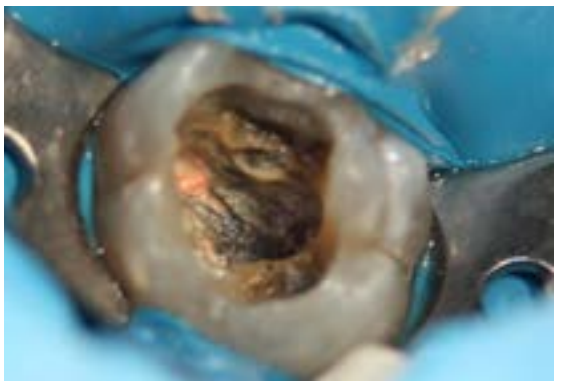

Figure 2: Roots were sealed using heated vertical condensation of gutta percha and sealant cement

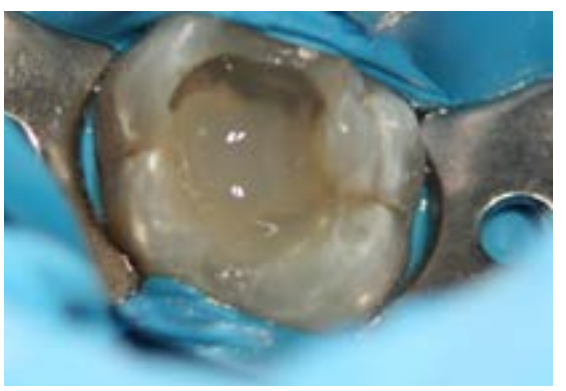

Figure 3: The base of the cavity was filled up in 4mm increments using SDR with each layer being cured

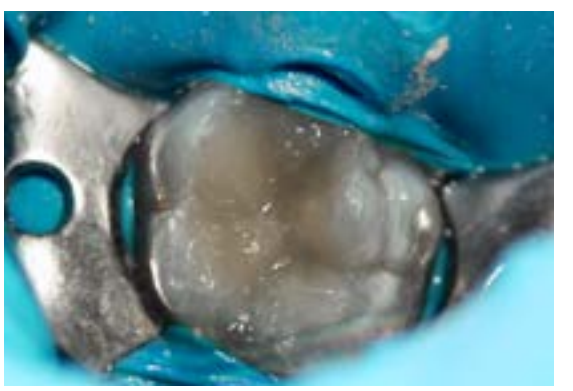

Figure 4: Finished with Enhance discs and polished with Pogo discs