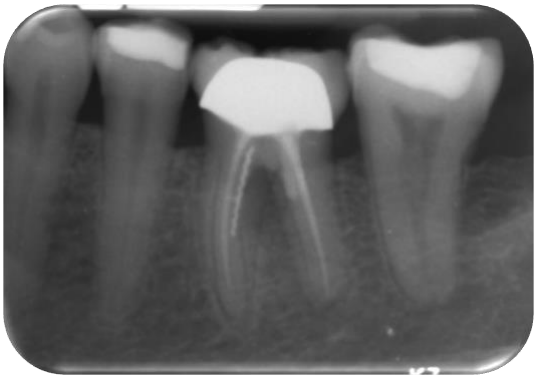

Figure 2 Pre-operative PA radiographs of tooth 36

Treatment plan

Tooth 36

1. Remove existing coronal restorations and assess restorability
2. Removal of fracture instrument and fibre post
3. Repair of perforation
4. Root canal retreatment
5. Composite restoration
6. Metal ceramic crown
7. Clinical and radiographic review

This case demonstrates the management of a lower molar with chronic apical and radicular periodontitis associated with a post perforation and fractured instrument.

Instruments fracture due to torsional or cyclic fatigue, creating a blockage which hinders the chemo-mechanical debridement of the canal and reducing the outcome of success (Sjogren et al 1990). Ideally the instrument should be bypassed or removed without excessive dentine removal. In this case, this was successfully achieved through the use of ultrasonics and an instrument removal system (IRS) kit. The instrument was coronally positioned and easily identifiable with the use of a microscope. Ultrasonics were used to create a platform and a trephine used to create space around the head of the instrument. This allowed for the IRS to successfully engage the instrument and for successful removal.

The fibre post was removed with ultrasonics. The perforation had allowed for percolation of tissue fluid which affected the resin bond to the canal walls thus aiding removal. 53% of

iatrogenic perforations occur, as a result of post preparation with majority of cases occurring in the maxillary arch and 27% in the mandibular arch (Kvinnsland 1989). This complication can be prevented by assessing the dimensions of the pulp space and anatomic variations (Kvinnsland 1989).

One of the most critical factors in manging perforations is the time lapse between occurrence and repair. In this case, the perforation occurred many months prior and was diagnosed clinically and radiographically by localised pocketing and the radiolucency in the furcal region on presentation. This was confirmed visually after removal of the fibre post and by bleeding from the site. Other methods of diagnosis include the use of paper points and electronic apex locators (Kaufmann et al 1997, Kaufman and Keila 1989).

The perforation was located and gently irrigated with sodium hypochlorite. MTA was used to repair the perforation. Studies have shown that perforation repairs with MTA lead to more favourable biological responses (Ford et al 1995; Holland et al 2001). A review showed overall success of more than 70% via an orthograde approach, with better results obtained with MTA (Siew et al 2015).

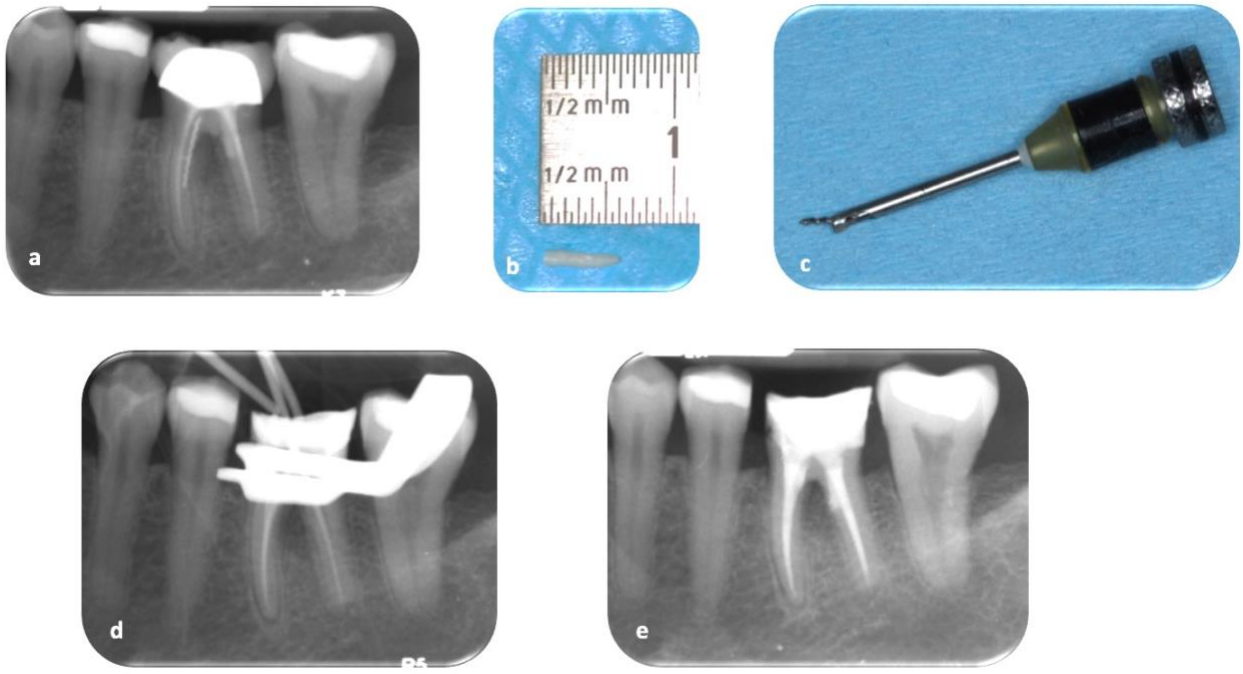

Figure 3 PA radiographs of tooth 36 (a) Pre-operative (b) Fibre post (c) Fractured instrument removed with IRS (d) Master cone (c) Postoperative radiograph, following placement of the composite core restoration.

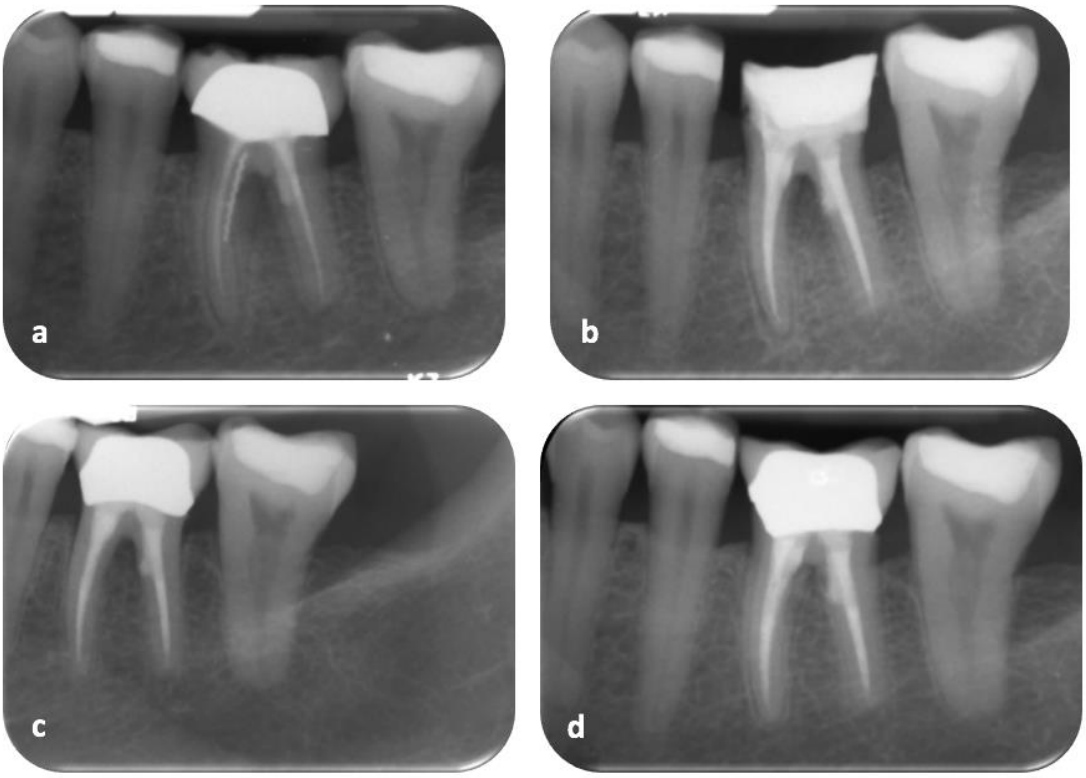

Figure 5 Review of tooth 36 (a) Pre-operative radiograph (b) Postoperative radiograph (c) 1-year review, showing periapical radiolucency is less dense (d) 2-year review, showing further reduction in the density and size of the periapical radiolucency