



Figure 4 Pre-operative CBCT of tooth 21 (a) Axial view (b) Sagittal view (c) Coronal view

This case demonstrates the management of an immature central incisor with chronic apical periodontitis and the subsequent surgical management after persisting disease.

MTA has been shown to be conducive to apexification and apical healing. In this case, it was used to provide an apical plug to prevent extrusion of the filling material as the canal was wide apically (ISO 70). It was imperative to prevent further enlargement of the canal so minimal mechanical preparation and copious irrigation with sodium hypochlorite was performed. To enhance the chemical debridement the irrigant was activated with ultrasonics to aid in the removal of debris and biofilm. MTA was placed with the use of ultrasonics to

ensure a well compacted 5mm plug and intracanal composite to reinforce the root walls, which has been shown to provide an adequate apical seal and strengthen immature teeth (Katebzadeh et al 1998; Lawley 2004).

In this case at 1 year there was no evidence of reduction in the apical radiolucency and surgery was subsequently required. As the tooth was in the aesthetic zone a papilla based incision was utilised to reduce scarring and recession (Velvart 2002). The success rate of surgical endodontic treatment using a modern technique has been reported to be close to 90% (Tsesis 2015). At 6 months both soft tissue healing was optimal with no recession and at one year almost complete radiographic healing was observed. The endodontic prognosis for this case is good as it has been demonstrated that majority of teeth that have healed at twelve months following surgery will show the same outcome at 3 to 5 years, however annual radiographic reviews should be arranged for the following three years unless complete healing has occurred (Halse 1991; ESE 2006).

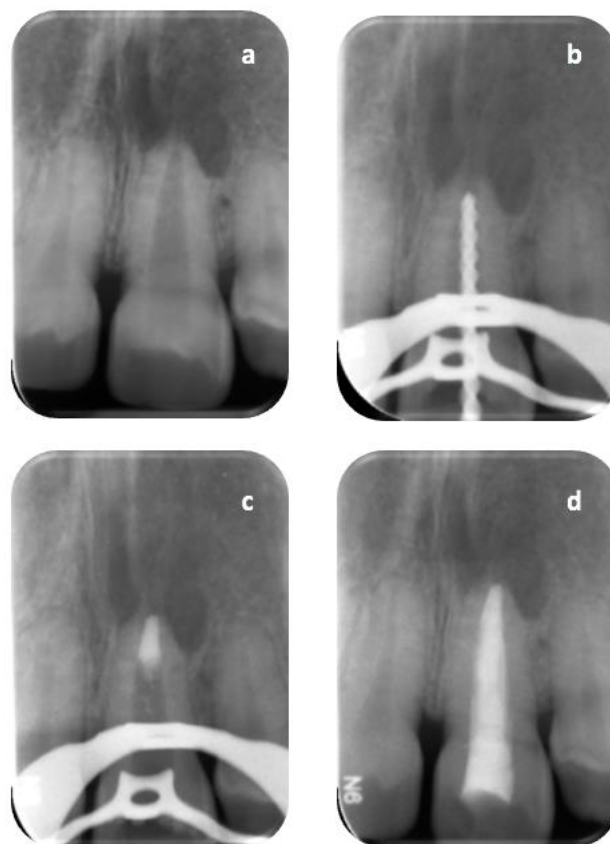
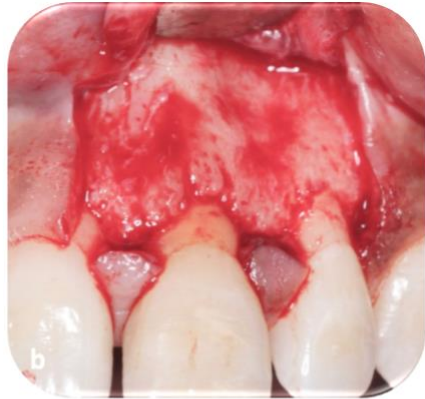


Figure 5 PA radiographs. (a) Pre-operative radiograph of tooth 21 (b) Working length radiograph of tooth 21 (c) Mid fill MTA radiograph (e) Postoperative photograph following placement of the composite core restorations



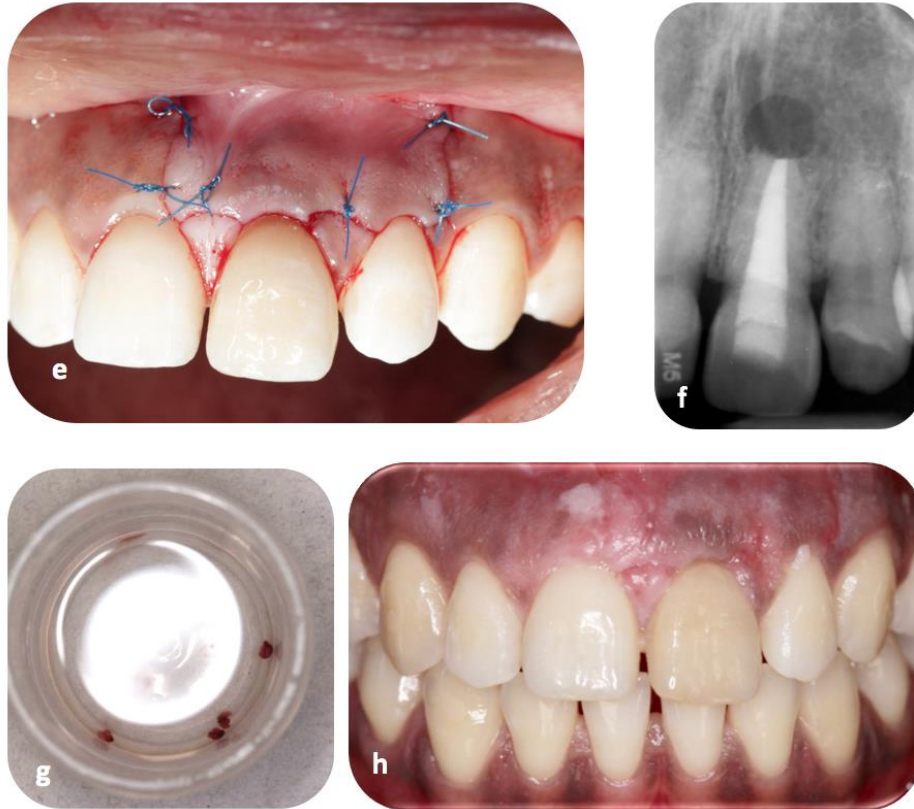


Figure 6 Apical surgery of tooth 21 (a) Surgical access, (b) osteotomy site and retraction soft tissue (c) bony crypt (d) root resection and MTA apically (e) Flap closure (f) Postoperative radiograph (g) Tissue sample sent for histology (h) 1 week postoperative photograph after suture removal.

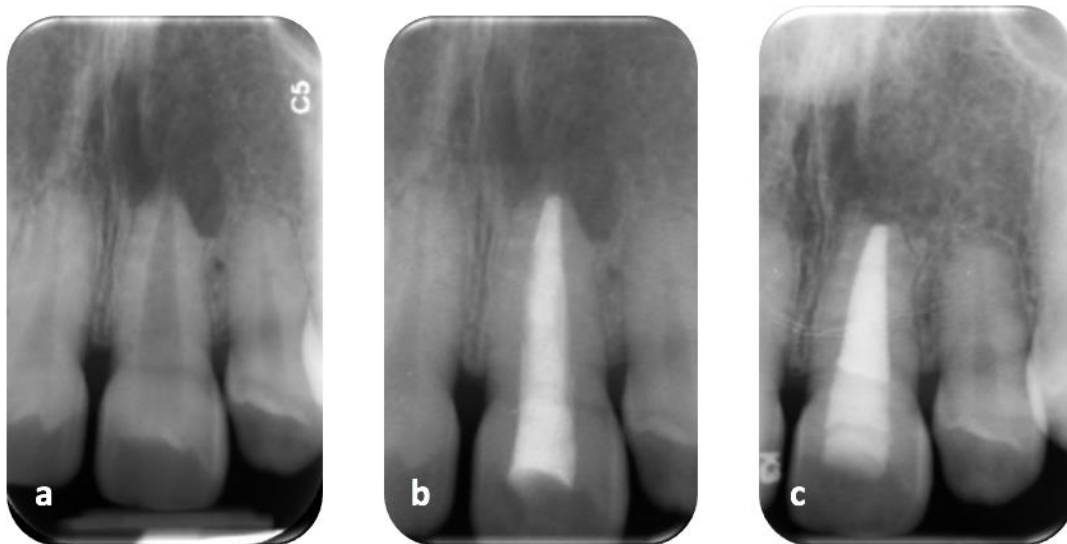


Figure 7 PA radiographs. (a) Pre-operative radiograph of tooth 21 (b) Postoperative radiograph (c) 1 year post apical microsurgery