Conservative Management of a Partially Impacted Mandibular Second Molar at Risk of Inferior Alveolar Nerve Injury During Extraction: Case Report

Saaid Al Shehadat[1], Mohamed Nidal Al Khouly[1], Shishir Ram Shetty[2], Apathsakayan Renugalakshmi[3], Venkateshbabu Nagendrababu[1,4], Paul M. H. Dummer[5]*

[1]Department of Restorative Dentistry, College of Dental Medicine, University of Sharjah, Sharjah, United Arab Emirates; [2]Department of Oral and Craniofacial Health Sciences, College of Dental Medicine, University of Sharjah, Sharjah, United Arab Emirates; [3]Department of Preventive Dental Sciences, Division of Pedodontics, College of Dentistry, Jazan University, Jazan - 45142, Saudi Arabia; [4]Department of Conservative Dentistry and Endodontics, Dr. D. Y. Patil Dental College & Hospital, Dr. D. Y. Patil Vidyapeeth (Deemed to be University), Pimpri, Pune, India; [5]School of Dentistry, College of Biomedical and Life Sciences, Cardiff University, Cardiff, United Kingdom.

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***Corresponding author:**
Dr. Saaid Al Shehadat,
Department of Restorative Dentistry, College of Dental Medicine, University of Sharjah, Sharjah, United Arab Emirates.
Phone No. +971-6-5057381
Email: salshehadat@sharjah.ac.ae

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ORCID IDs:
Saaid Al Shehadat - 0000-0001-9112-6386
Mohamed Nidal Al Khouly-0009-0004-5030-5707
Shishir Ram Shetty- 0000-0002-8097-6024
Venkateshbabu Nagendrababu - 0000-0003-3783-3156
Apathsakayan Renugalakshmi - 0000-0002-8362-0007
Paul MH Dummer- 0000-0002-0726-7467

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Abstract

This case report describes the conservative management of an incompletely erupted, subgingivally positioned mandibular right second molar with extensive caries and periapical pathosis in close anatomical relationship to the IAN canal. Complete extraction was initially considered as a provisional treatment option. However, CBCT revealed partial encirclement of the IAN canal by the roots, leading to a conservative treatment plan comprising root canal treatment followed by coronectomy. The initial treatment involved the extraction of tooth 48, followed by root canal treatment and tooth restoration of tooth 47; the patient declined coronectomy. At the one-year follow-up, the patient was asymptomatic and periapical radiographs and CBCT scans indicated substantial periapical healing and preservation of the IAN. This case illustrates the role of CBCT-guided conservative endodontic management of impacted teeth as a viable alternative to extraction in high-risk anatomical situations.

Keywords: Cone beam computed tomography. Coronectomy. Impacted tooth. Inferior alveolar nerve. Root canal treatment.

Introduction

Impacted mandibular molars are frequently encountered in clinical practice, most commonly involving third molars.[1] However, impaction or partial eruption of mandibular second molars, though less common, can present more complex diagnostic and therapeutic challenges, particularly when associated with periapical pathosis and anatomical proximity to the inferior alveolar nerve (IAN).[2,3]

Conventional management of non-restorable or partially erupted molars with apical pathosis often involves extraction, which poses a significant risk of IAN injury in cases of intimate root–nerve association, potentially resulting in transient or permanent neurosensory deficits.[2,4,5] When surgical extraction carries a high risk of nerve trauma, conservative alternatives such as root canal treatment (RCT) with or without coronectomy may be considered to preserve nerve integrity although the evidence for coronectomy is primarily derived from studies on mandibular third molars with high-risk root-nerve relationships.[4,6,7]

Various two-dimensional images such as periapical and panoramic radiographs, and three-dimensional images, such as cone beam computed tomography (CBCT), have been employed to assess the distance between roots of mandibular molars and the inferior alveolar canal.[8,9,10] CBCT has the ability to evaluate the relationships between the IAN and the neighbouring anatomical structures, without superimposition or distortion, which is considered a major drawback of conventional radiographs.[11]

This case report presents a rare and complex partially impacted mandibular second molar (FDI tooth 47) with extensive caries and periapical pathosis in close proximity to the IAN. The case was managed conservatively through root canal treatment and tooth restoration, and illustrates the clinical decision-making process required to preserve neural integrity and achieve a favourable prognosis. Reports describing such approaches for second molars with high-risk anatomy are limited, underscoring the relevance of this contribution to endodontic and oral surgical practice.

Case presentation

This case report followed the Preferred Reporting Items for Case reports in Endodontics (PRICE 2020) guidelines. The clinical management pathway is summarised in Supplementary Fig. 1. A 46-year-old male was referred for management of a persistent abscess associated with a partially erupted mandibular right second molar (tooth 47). The patient presented with a right-sided extraoral swelling and corresponding intraoral swelling associated with teeth 47 and 48. Prior to referral, the referring practitioner had attempted to manage the infection by creating drainage through an occlusal access cavity in tooth 47 and a buccal incision; they had prescribed a combination of amoxicillin/clavulanic acid (Augmentin) and metronidazole. However, these measures failed to resolve the symptoms.

Tooth 47 was incompletely erupted, partially impacted, and subgingivally positioned. Its occlusal surface was located at the cervical level of tooth 46 and was covered by gingival soft tissue at the initial examination; as a consequence, the crown

was not directly visible clinically. This position was demonstrated on the OPG and sagittal CBCT reconstruction (Fig. 1A, B). Tooth 47 was tender to percussion, but pulp sensibility testing was not feasible because of its limited accessibility. The reconstructed OPG revealed a well-defined periapical radiolucency centred on tooth 47, with a potentially close relationship to the IAN (Fig. 1A, B). Based on the clinical history and radiographic findings, a diagnosis of pulp necrosis with acute apical abscess was made for tooth 47. The main diagnostic challenge was the limited clinical accessibility of tooth 47, which prevented pulp sensibility testing and complicated conventional access cavity preparation. Although the swelling involved the region of teeth 47 and 48, the findings favoured tooth 47 as the principal source of the infection: tooth 48 responded to cold testing and had no periapical radiolucency , whereas tooth 47 was tender to percussion and the radiolucency was centred on its roots. Nevertheless, a concomitant contribution from the pericoronal tissues of tooth 48 could not be completely excluded.

At the initial assessment in the supervised postgraduate endodontic teaching clinic, extraction of tooth 47 was considered as a provisional treatment option because of the persistent infection, extensive caries, subgingival position, and restricted clinical access. However, extraction was not formally planned or scheduled at that time. As the reconstructed OPG suggested a close relationship between the roots of tooth 47 and the IAN canal, a CBCT scan was obtained before making a definitive treatment decision in order to evaluate the three-dimensional root–nerve relationship. Given the need to manage the acute infection, an emergency attempt was made to create an access cavity in tooth 47 after CBCT acquisition; however, adequate access and drainage could not be achieved because of the limited accessibility. Consequently, the adjacent tooth 48 was

extracted in collaboration with an experienced oral surgeon to facilitate drainage and improve access to tooth 47.

Two weeks following the extraction of tooth 48, the swelling had resolved and the patient was asymptomatic. This improvement was interpreted as control of the acute inflammatory episode following drainage and decompression associated with the extraction rather than as confirmation that tooth 48 was the primary source, particularly because the periapical lesion centred on tooth 47 remained radiographically evident. An intraoral periapical radiograph revealed a well-defined periapical radiolucency associated with tooth 47 (Fig. 1C). Review of the CBCT dataset acquired at the initial clinic visit revealed a well-defined periapical lesion associated with tooth 47 measuring approximately 11.5 mm in the apico-coronal dimension, 13.08 mm mesio-distally, and 9.06 mm bucco-lingually. Detailed evaluation demonstrated that the IAN canal coursed between the roots of tooth 47, which partially encircled the canal (Fig. 1D–F). Consequently, complete extraction, which had previously been considered as a provisional treatment option, was not pursued because of the potential risk of nerve injury. At the two-week review, the definitive conservative treatment plan consisted of RCT followed by coronectomy to retain the roots and minimise the risk of IAN injury.

At this stage, the principal priorities were relief of the patient's symptoms and control of the endodontic infection. RCT was intended to eliminate the intraradicular infection, whereas coronectomy was proposed as a conservative surgical option to manage the poorly accessible coronal portion while retaining the roots because of their close relationship with the IAN canal. Surgical exposure, orthodontic uprighting, and

combined orthodontic–endodontic management were not incorporated into the initial treatment plan because they would not have directly addressed the endodontic infection and would have required prolonged staged treatment. Although the patient consented to RCT, he declined the coronectomy, expressing confidence in maintaining adequate oral hygiene and agreeing to regular follow-ups.

Following the two-week review, definitive RCT was scheduled for the next available appropriately supervised treatment session in the postgraduate endodontic teaching clinic and was performed three weeks later, approximately five weeks after the emergency intervention and extraction of tooth 48. The interval was partly related to the clinic's structured referral and appointment-allocation process, high patient volume, and the availability of an appropriately supervised postgraduate treatment session. During this period, further healing of the tooth 48 extraction socket and adjacent soft tissues improved access to the subgingivally positioned tooth 47 and facilitated secure placement of the modified rubber dam clamp. At the RCT appointment, the temporary restoration was found to have dislodged, leaving the pulp chamber exposed; however, the precise timing of its loss could not be determined. A preoperative periapical radiograph (Fig. 1C) revealed significant gouging of the pulp chamber resulting from the emergency intervention by the referring practitioner, reflecting the challenges of preparing an appropriate access cavity due to the subgingival position of the tooth.

A rubber dam was applied to mitigate the risks of irrigant ingestion and instrument aspiration. Isolation was achieved by modifying an Ivory® rubber dam clamp No. 13A

(Hu-Friedy, Chicago, IL, USA) to secure it onto the alveolar ridge adjacent to the target site. Gauze was placed beneath the clamp wings to minimise soft tissue trauma, and Liquidam® (Ultradent Products Inc., South Jordan, UT, USA) was applied to enhance the peripheral seal. Using a dental operating microscope (M A801-LED, Global Surgical Corporation, Tokyo, Japan), RCT was completed in a single visit. Three canals were prepared using the ProTaper Gold system (Dentsply Sirona, Ballaigues, Switzerland), with mesial canals to size F2 and the distal canal to size F3. Root filling was performed using warm vertical condensation of gutta-percha with AH Plus® sealer (Dentsply Sirona, Konstanz, Germany) (Fig. 2A, B). Minor sealer extrusion through a lateral canal was observed on the post-opertive radiograph (Fig 2B). The canal orifices and pulpal floor were protected with glass ionomer cement (Fuji IX; GC Corporation, Tokyo, Japan), followed by definitive restoration with resin composite (Filtek™ Z300; 3M ESPE, St. Paul, MN, USA). The tooth was subsequently maintained out of occlusion.

Follow-up examinations were performed at one week, one month, six months (Fig. 2C, D), and 12 months (Fig. 3A-E). At the one-year review, the patient remained asymptomatic, with no clinical signs of swelling, sinus tract, tenderness to percussion, or abnormal tooth mobility. Periapical radiographs and a CBCT scan revealed progressive healing of the periapical lesion with preservation of the IAN canal. No adverse or unanticipated events, including neurosensory symptoms, were reported during the follow-up period.

Further spontaneous eruption of tooth 47 was observed during the follow-up period after removal of tooth 48. This favourable positional change prompted consideration of orthodontic extrusion as a potential future option to improve the position and function of the tooth. However, no active orthodontic extrusion or uprighting of tooth 47 was performed during the reported follow-up period.

Written informed consent for publication of this report and the accompanying clinical images was obtained from the patient.

Discussion

The management of partially impacted mandibular molars in close proximity to the inferior alveolar nerve (IAN) is a significant clinical dilemma. While extraction is often considered as the definitive treatment, intimate root–nerve relationships, as demonstrated on CBCT, are associated with an increased risk of iatrogenic neurosensory injury.[4,12] In such situations, conservative endodontic management is a viable alternative, provided that infection control and long-term tooth survival are considered, with CBCT playing an important role in the assessment and management of complex mandibular molar cases.[13]

According to a retrospective investigation, mandibular second molars with direct connection between the apex of the roots and the inferior alveolar canal had a high incidence of 60%.[9] Another study reported that the IAN was intimately connected to the roots of mandibular second molars in more than 50% of the cases that were evaluated using CBCT.[14] In the present case, CBCT revealed that the IAN canal coursed between

and was partially encircled by the roots of tooth 47. Consequently, extraction, which had been considered only as a provisional treatment option, was not pursued, and RCT with tooth retention was selected.

Restricted access due to the subgingival position of tooth 47 was a major technical challenge in the current case. Limited visualisation and unfavourable instrument angulation increase the risk of procedural errors, as reflected by the initial gouging of the pulp chamber and failure of the temporary restoration placed during the initial emergency care prior to the referral. In addition, mandibular second molars have been reported to exhibit complex and atypical root canal configurations, underscoring the importance of detailed anatomical assessment during endodontic treatment planning.[15] Early loss of the temporary restoration may have contributed to coronal leakage and microbial re-contamination, which are recognised factors that can influence the outcome of RCT.[16,17]

Long-term maintenance of oral cleanliness in the posterior mandibular region was a critical consideration. The anatomical position of impacted or partially erupted second molars may limit effective plaque control and compromise the long-term prognosis.[2,18] This concern supported the recommendation for coronectomy following RCT, as recurrent disease in areas with limited access may compromise the coronal restoration and potentially lead to post-treatment endodontic disease.[16,17] In addition, extraction in such cases carries a risk to the IAN. Although coronectomy is most commonly described for mandibular third molars, its application may be justified in second molars exhibiting comparable anatomical risk factors.[4,6,19]

In the present case, coronectomy was recommended as part of the treatment plan to minimise the risk of IAN injury; however, the procedure was not performed because of the patient's expressed preference. Respect for patient autonomy is a fundamental principle of contemporary clinical practice, and shared decision-making is particularly important when multiple treatment options exist with differing risk profiles. The recent FDI ethical policy statement emphasises that dentists must place patient welfare at the centre of all clinical decisions, while maintaining honesty, compassion, professionalism, and respect for patient autonomy. Dentists should obtain valid informed consent, provide evidence-based treatment within their level of competence, and ensure confidentiality of patient information. Ethical dental practice should always prioritise patient safety, trust, and long-term oral health outcomes.[20] In complex cases such as this, incorporating the patient's informed choice is recommended to ensure patient-centred care, optimise treatment acceptance, and maintain ethical clinical standards.

Surgical exposure, orthodontic uprighting, and combined orthodontic–endodontic or surgical–orthodontic approaches are recognised options for managing impacted mandibular second molars.[2,19] However, these approaches were not actively pursued during the initial management because the immediate priority was control of the endodontic infection. Following removal of tooth 48, further spontaneous eruption of tooth 47 was observed during follow-up. This favourable positional change suggested that orthodontic extrusion could subsequently be considered to improve the position and function of the tooth once satisfactory endodontic healing has been established. No active

orthodontic extrusion or uprighting of tooth 47 was undertaken during the reported follow-up period.

It is well known that endodontic instruments may inadvertently extend beyond the apical foramen when carrying out canal preparation and, in rare cases, penetrate the IAN.[3,21] In addition, extrusion of irrigating solutions, particularly sodium hypochlorite, beyond the apical foramen can result in chemical injury to periapical tissues and, in severe cases, neurotoxicity affecting the IAN.[22,23] Likewise, the inadvertent extrusion of endodontic sealers into the mandibular canal has been associated with chemical neuritis and persistent neurosensory disturbances due to their cytotoxic properties.[12,24] Therefore, it is imperative for clinicians to carefully assess the anatomical relationship between mandibular teeth and the IAN prior to initiating RCT, particularly in cases with suspected close proximity.

Rubber dam isolation was indispensable in this case for both infection control and patient safety. Effective chemomechanical canal debridement using sodium hypochlorite requires a secure seal, particularly in posterior mandibular regions close to the oropharynx. In addition, the use of magnification was essential to manage the complex anatomy and restricted access by enhancing visualisation and procedural control.[25] These technical measures are consistent with evidence indicating that meticulous treatment quality is an important determinant of root canal treatment outcomes.[16]

Isolation was achieved through modification of a rubber dam clamp to engage the alveolar ridge, a technique that remains operator-dependent and highlights the limitations of currently available isolation devices. The development of rubber dam clamps designed for alveolar anchorage, incorporating soft or elastomeric coatings and anatomical size variations, will facilitate safer and more predictable isolation in cases involving partially erupted teeth, short clinical crowns, or severely compromised coronal tissues.

Material selection for canal filling was guided by concern regarding potential sealer extrusion around the IAN canal. Despite conservative application, resin-based sealer extrusion through a lateral canal was observed in this case, but without any signs or symptoms. Sealer extrusion into the IAN canal has been associated with chemical neuritis and persistent neurosensory disturbances.[12] For cases involving planned coronectomy and root submergence, alternative materials such as mineral trioxide aggregate or glass ionomer cement can be considered for protecting canal orifices due to their favourable sealing properties and biocompatibility.

Accurate CBCT assessment of the 3D relationship between the root of the roots of tooth 47 and the IAN canal was a major strength of this case. This helped in the treatment planning and mitigated the risk of injury to the IAN. This case also demonstrates how magnification and modified isolation techniques can facilitate RCT in a technically challenging, partially impacted mandibular molar. The favourable one-year clinical and radiographic outcome further supports the feasibility of conservative tooth retention in

selected cases with high-risk anatomy, although longer follow-up and further evidence are required.

The principal limitations of this report are its single-patient design and one-year follow-up period. An additional limitation of the clinical management was the approximately five-week interval between emergency management and definitive RCT, which was partly related to the structured referral pathway and appointment availability within the high-volume, supervised postgraduate endodontic teaching clinic. Although the acute swelling had resolved by the two-week review, earlier definitive treatment would have been preferable. Accordingly, the findings cannot be generalised to all impacted mandibular second molars with similar high-risk anatomy. Longer follow-up is required to confirm long-term tooth survival, periodontal stability, and continued preservation of neurosensory function.

Conclusion

This case demonstrates that conservative endodontic management of a partially impacted mandibular second molar with high-risk root anatomy is a viable alternative to extraction when guided by CBCT imaging and executed with meticulous isolation, magnification, and material selection. Careful patient selection and long-term follow-up remain essential to ensure favourable long-term outcomes and tooth survival.

References

1. Quek S, Tay C, Tay K, Toh S, Lim K. Pattern of third molar impaction in a Singapore Chinese population: a retrospective radiographic survey. Int J Oral Maxillofac Surg 2003; 32: 548–552.
2. Barone S, Antonelli A, Bocchino T, Cevidanes L, Michelotti A, Giudice A. Managing mandibular second molar impaction: a systematic review and meta-analysis. J Oral Maxillofac Surg 2023; 81: 1403–1421.
3. Castro R, Guivarc'h M, Foletti J, Catherine J, Chossegros C, Guyot L. Endodontic-related inferior alveolar nerve injuries: a review and a therapeutic flow chart. J Stomatol Oral Maxillofac Surg 2018; 119: 412–418.
4. Renton T, Hankins M, Sproate C, McGurk M. A randomised controlled clinical trial to compare the incidence of injury to the inferior alveolar nerve as a result of coronectomy and removal of mandibular third molars. Br J Oral Maxillofac Surg 2005; 43: 7–12.
5. Ali A S, Benton J A, Yates J M. Risk of inferior alveolar nerve injury with coronectomy versus surgical extraction of mandibular third molars: a comparison of two techniques and review of the literature. J Oral Rehabil 2018; 45: 250–257.
6. Kang F W, Yuan X R, Li G C et al. Coronectomy in lower third molar surgery: a systematic review and meta-analysis. J Oral Maxillofac Surg 2025; 83: 601–615.
7. Sencimen M, Ortakoglu K, Aydın C et al. Is endodontic treatment necessary during coronectomy procedure? J Oral Maxillofac Surg 2010; 68: 2385–2390.
8. Kositbowornchai S, Densiri-Aksorn W, Piumthanaroj P. Ability of two radiographic methods to identify the closeness between the mandibular third molar root and the inferior alveolar canal: a pilot study. Dentomaxillofac Radiol 2010; 39: 79–84.
9. Srivastava S, Alharbi H M, Alharbi A S, Soliman M, Eldwakhly E, Abdelhafeez M M. Assessment of the proximity of the inferior alveolar canal with the mandibular root apices and cortical plates: a retrospective cone beam computed tomographic analysis. J Pers Med 2022; 12: 1784.
10. Hiremath H, Agarwal R, Hiremath V, Phulambrikar T. Evaluation of proximity of mandibular molars and second premolar to inferior alveolar nerve canal among central Indians: a cone-beam computed tomographic retrospective study. Indian J Dent Res 2016; 27: 312–316.
11. Karameh R, Abu-Ta'a M F, Beshtawi K R. Identification of the inferior alveolar canal using cone-beam computed tomography versus panoramic radiography: a retrospective comparative study. BMC Oral Health 2023; 23: 445.
12. Pogrel M A. Damage to the inferior alveolar nerve as the result of root canal therapy. J Am Dent Assoc 2007; 138: 65–69.
13. Patel S. New dimensions in endodontic imaging: part 2. Cone beam computed tomography. Int Endod J 2009; 42: 463–475.
14. Chong B, Quinn A, Pawar R, Makdissi J, Sidhu S. The anatomical relationship between the roots of mandibular second molars and the inferior alveolar nerve. Int Endod J 2015; 48: 549–555.
15. Khawaja S, Alharbi N, Chaudhry J et al. The C-shaped root canal systems in mandibular second molars in an Emirati population. Sci Rep 2021; 11: 23863.

16. Ng Y L, Mann V, Gulabivala K. A prospective study of the factors affecting outcomes of nonsurgical root canal treatment: part 1: periapical health. Int Endod J 2011; 44: 583–609.
17. Gulabivala K, Ng Y L. Factors that affect the outcomes of root canal treatment and retreatment: a reframing of the principles. Int Endod J 2023; 56: 82–115.
18. Fu P S, Wang J C, Wu Y M et al. Impacted mandibular second molars. Angle Orthod 2012; 82: 670–675.
19. Leung Y Y, Cheung L K. Risk factors of neurosensory deficits in lower third molar surgery: a literature review of prospective studies. Int J Oral Maxillofac Surg 2011; 40: 1–10.
20. FDI World Dental Federation. Ethics in dentistry. Int Dent J 2025; 75: 7–8.
21. Gandhi N, Gandhi S, Bither S. Displacement of endodontic instruments in inferior alveolar canal. Indian J Dent Res 2011; 22: 736.
22. Hülsmann M, Hahn W. Complications during root canal irrigation: literature review and case reports. Int Endod J 2000; 33: 186–193.
23. Guivarc'h M, Ordioni U, Ahmed H M A, Cohen S, Catherine J H, Bukiet F. Sodium hypochlorite accident: a systematic review. J Endod 2017; 43: 16–24.
24. Mahmood H, Hoare J, Atkins S. Chemical neurotoxicity to the inferior alveolar nerve—A rare sequela of endodontic treatment. Oral Surgery. 2022;15:663-8.
25. Del Fabbro M, Taschieri S, Lodi G, Banfi G, Weinstein R L. Magnification devices for endodontic therapy. Cochrane Database Syst Rev 2015; 2015: CD005969.

Figure legends

Fig. 1: Radiographic documentation of the management of tooth 47. (A&B) Orthopantomogram and sagittal/parasagittal preoperative CBCT reconstruction demonstrating a partially impacted mandibular right second molar (tooth 47) positioned subgingivally distal to tooth 46 with intimate spatial anatomical relationship between the roots of tooth 47 and the inferior alveolar nerve (IAN) canal (white arrows); (C) Preoperative periapical radiograph showing restricted access to tooth 47 and marked gouging of the pulp chamber created during the initial emergency treatment, attributable to limited visibility and unfavourable angulation; (D,E,F) CBCT images of tooth 47 in sagittal (D), axial (E), and coronal (F) planes showing the location of IAN canal (red arrows) between the roots of tooth 47.

Fig. 2: (A) Master cone radiograph obtained during root canal treatment following modified rubber dam isolation; (B) Immediate postoperative periapical radiograph demonstrating the root filling using warm vertical condensation of gutta-percha with sealer, and placement of the definitive composite restoration; (C,D) Six-month follow-up clinical photograph and periapical radiograph demonstrating acceptable oral cleanliness in the treated area and progressive healing of the periapical lesion.

Fig. 3: One-year follow-up clinical and radiographic assessment confirming favourable healing of the periapical lesion associated with tooth 47. (A) Clinical photograph demonstrating spontanous eruption of tooth 47 compared with the preoperative position. Orthodontic brackets are visible on teeth 44 and 46; however, no active orthodontic

extrusion or uprighting of tooth 47 was undertaken during the reported follow-up period.; (B) Periapical radiograph showing substantial periapical healing; **(**C–E) Follow-up CBCT images in sagittal, axial, and coronal views, respectively, showing progressive periapical healing and preservation of the inferior alveolar nerve canal.

Supplementary Fig. 1: PRICE 2020 clinical flowchart summarising the chronological management pathway. The flowchart shows the initial presentation, imaging-based assessment of the relationship between tooth 47 and the inferior alveolar nerve, modification of the treatment plan from extraction to conservative root canal treatment, patient decision regarding coronectomy, endodontic treatment and restoration, and the one-year follow-up outcome.

Fig 1

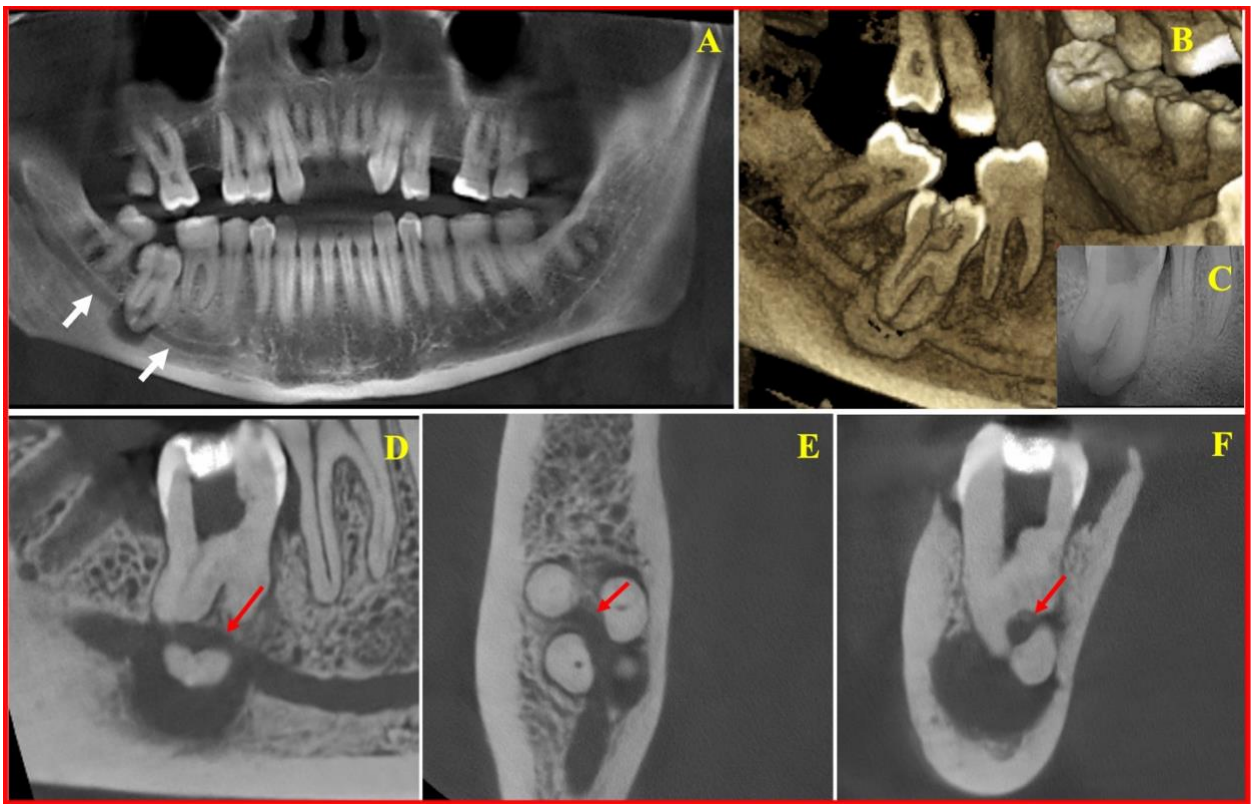

Fig 2

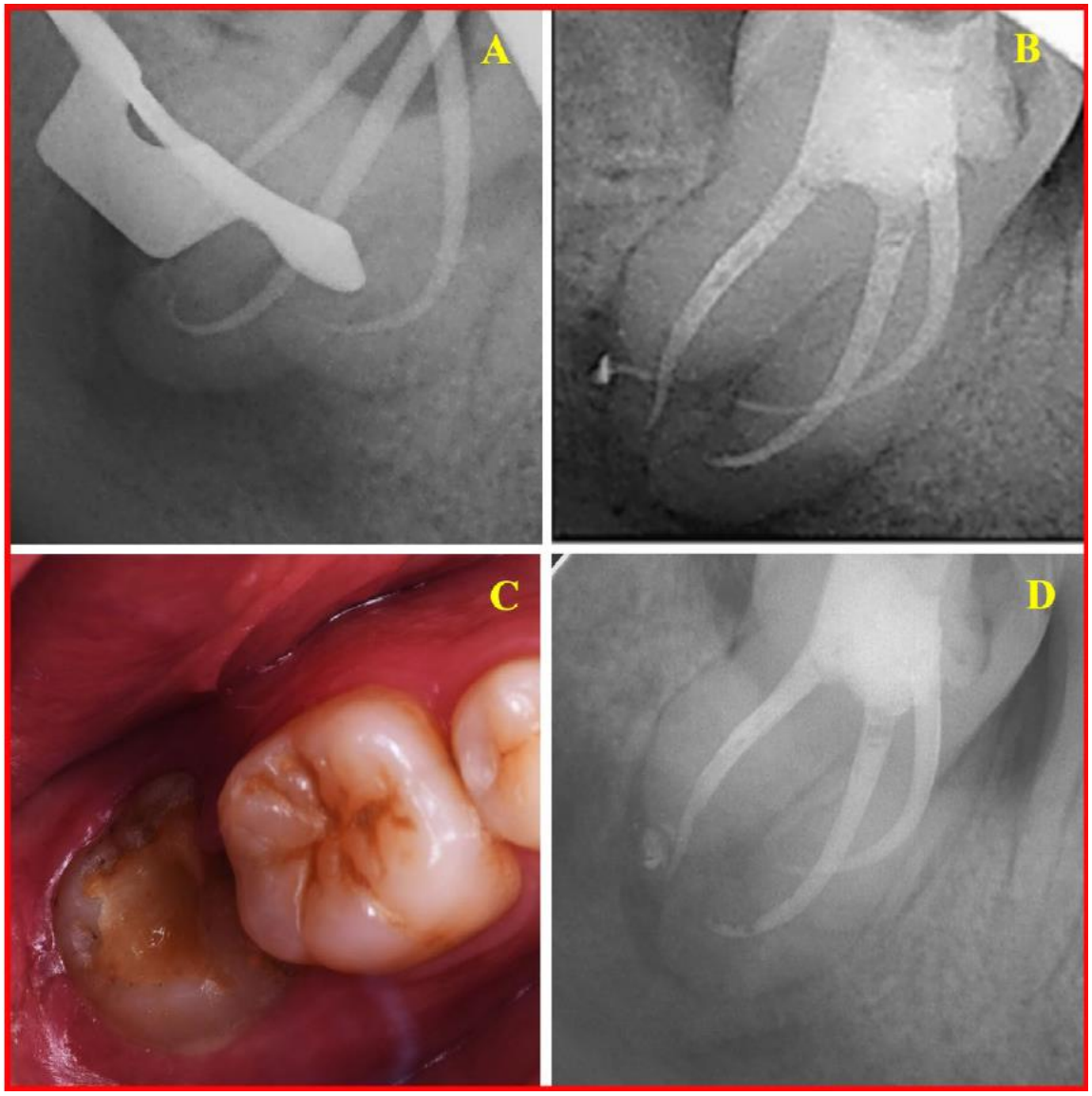

Fig 3