MANAGEMENT OF TWO ROOTED MANDIBULAR SECOND PREMOLARS: A CASE SERIES

Authors: (Department of Conservative Dentistry and Endodontics, Tamilnadu Government Dental College, Chennai- 600 003)

Author: C.S.Shobana (Ex- PG student)

Co-author: Dr M.Kavitha MDS (Professor and HOD)

Dr S.Velayudham (III yr PG student)

Introduction:

One of the most complex anatomies can be attributed to the root canals, as the variations are most unpredictable and the presence of a single canal with a single portal of exit is an exception rather than the rule. The root canal anatomy of an extracted tooth is often studied through clearing and staining techniques but in the clinical scenario a thorough knowledge of the root canal anatomy can be assessed only through imaging techniques. This report is a case series on the diagnosis and management of mandibular second premolars with aberrant morphology.

Case 1:

Mr Arun Pandiyan, a 29 year old male patient reported with the chief complaint of pain in the right lower back tooth for the past 1 week.

History: Pain was severe continuous and aggravates in the night time.

Clinical examination: Dental caries in 45 with pain on probing and pain on percussion in 45.

Radiographic examination: Dental caries approximating the pulp space in 45, disappearance of the root canal space in the middle third of 45 and re appears in the apical third. (fig 1.a)

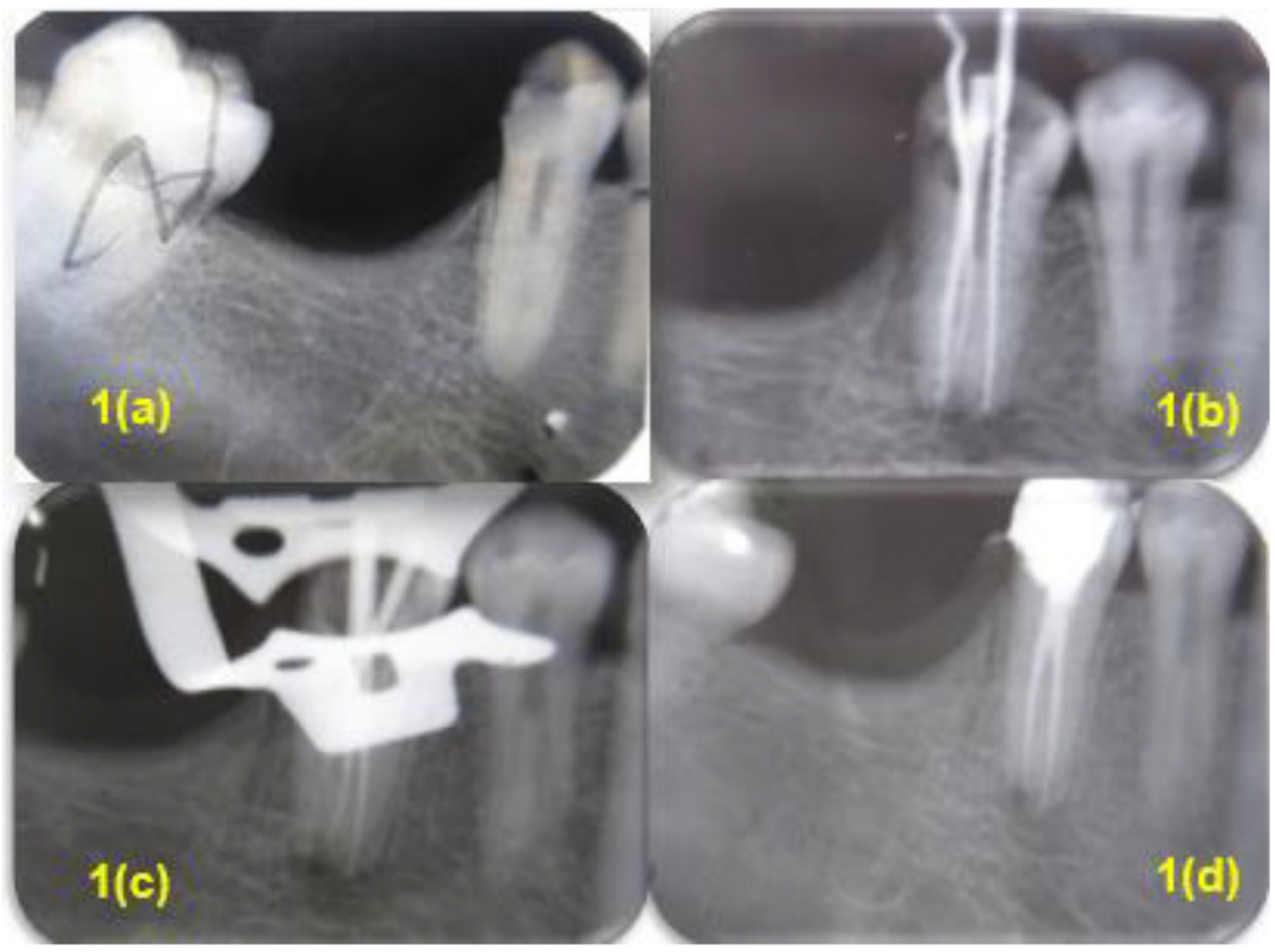
CBCT findings: Buccal and palatal root in 45, bifurcation seen at the junction of middle and apical third. C-shaped canal configuration in buccal canal of 45. One apical exit through each root. (fig 1.e through g)

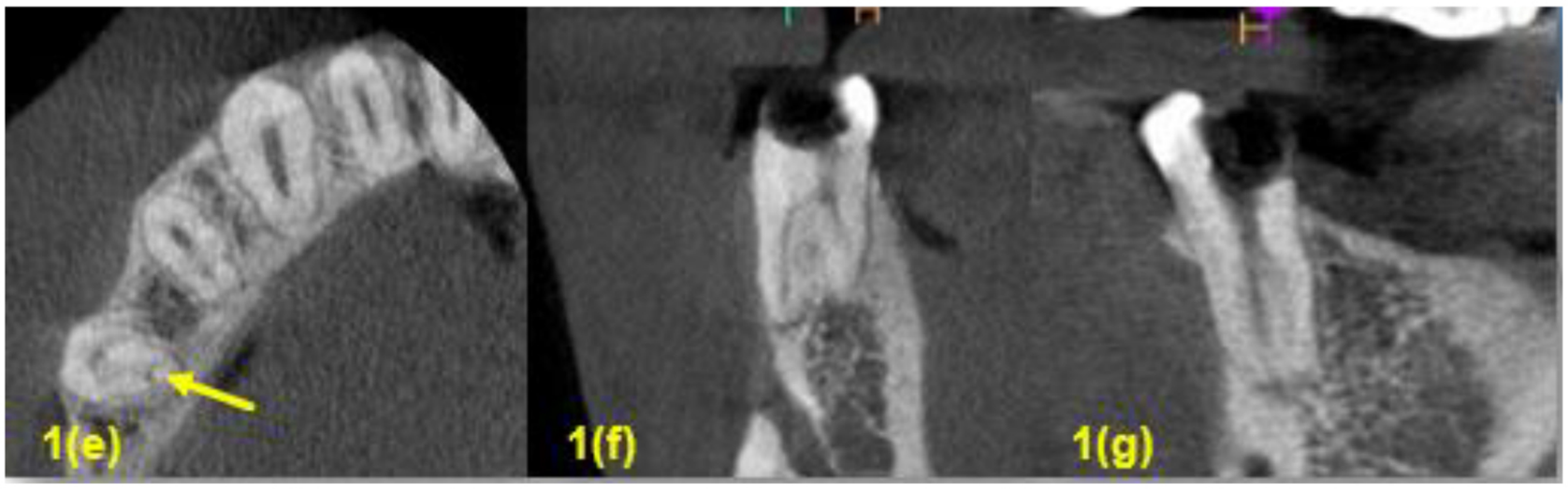
Diagnosis: Dental caries in 45 with symptomatic irreversible pulpitis

Treatment plan: Root canal treatment in 45

Procedure:

Under LA with Adrenaline (2% Lignocaine with 1:80000 Adrenaline), access opening was done in 45. Buccal and palatal canals were located and negotiated. Working length was determined using electronic apex locator and confirmed with a diagnostic radiograph (fig 1 (b). The working length was measured as 18.5 mm in the buccal canal and 19 mm in the palatal canal. Cleaning and shaping was done in 45 with Protaper F2 NiTi rotary instrument using 3% NaOCl and normal saline as irrigants. After confirmation with master cone IOPA (fig 1 (c), the palatal canal was obturated with F2 protaper gutta percha and Zinc Oxide Eugenol sealer and the C- shaped buccal canal was obturated using thermoplasticized gutta percha technique. (fig 1 (d).





Case 2:

Mr Maniratnavel, a 27 year old male patient reported with the chief complaint of pain in the right lower back tooth for the past 1 week.

History: Pain was severe spontaneous and aggravates in the night time. History of root canal treatment in the same tooth 2 months back.

Clinical examination: Temporary restoration in 45 with tenderness on percussion in 45.

Radiographic examination: Incomplete obturation in 45 which also demonstrated a missed root and a missed canal. (Fig 2.a)

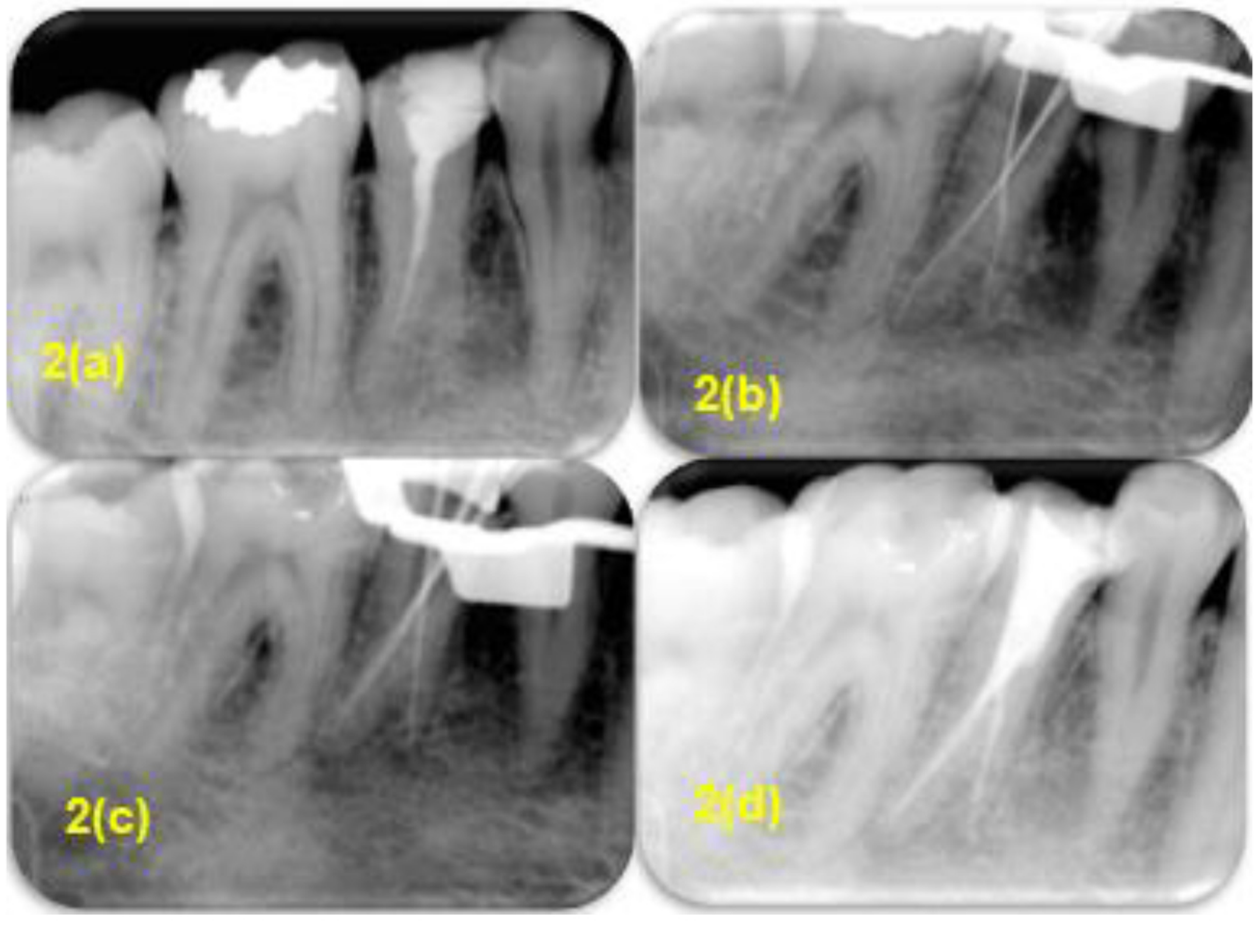
CBCT findings: Mesial and distal root in 45. One root canal in the mesial root and two root canals (distobuccal and distolingual) in the distal root. (Fig 2.e through 2.g)

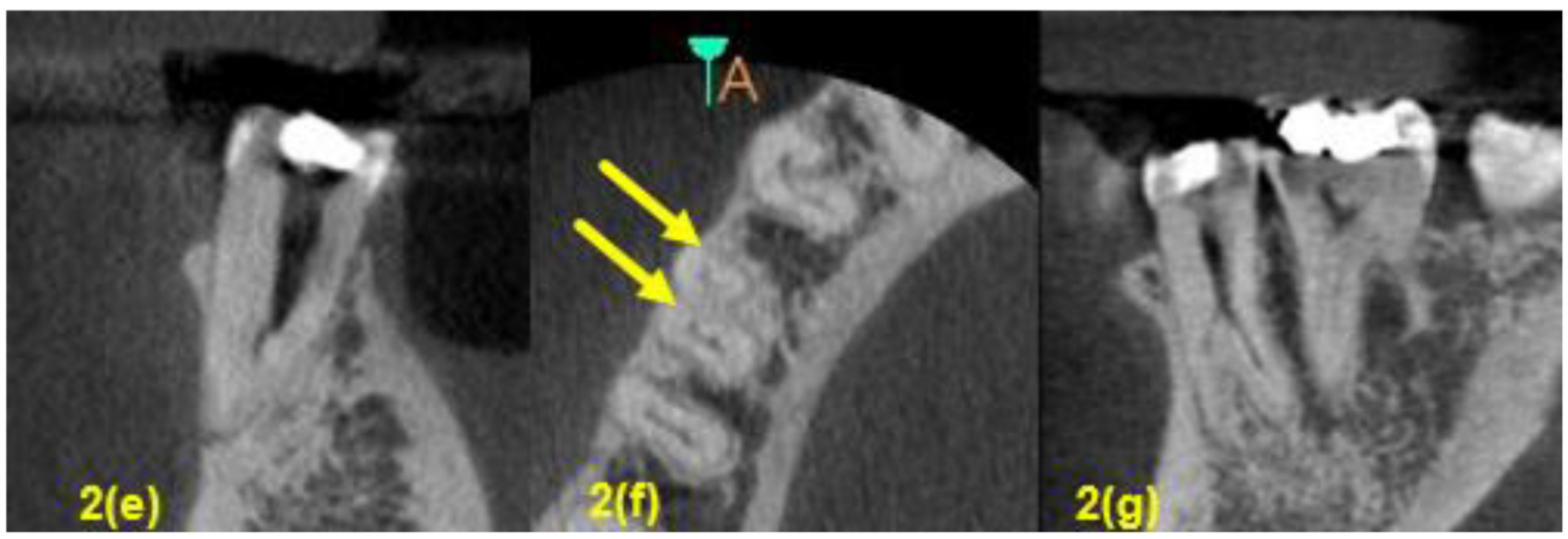
Diagnosis: Previously root canal treated 45 with symptomatic apical periodontitis

Treatment plan: Root canal retreatment in 45

Procedure:

Under LA with Adrenaline (2% Lignocaine with 1:80000 Adrenaline), access opening was done in 45. Mesial, distabuccal and distolingual canals were located and negotiated. Working length was determined using electronic apex locator and confirmed with a diagnostic radiograph (Fig 2.b). The working length was measured as 17.5mm in mesial, 19mm in distabuccal and 18mm distolingual canals. Cleaning and shaping was done in 45 upto K file no # 30 using 3% NaOCl and normal saline as irrigants and obturated with # 30 gutta percha and Zinc Oxide Eugenol sealer using cold lateral condensation technique (Fig 2.c & d).





Case no 3:

Mr Bahrudeen, a 45 year old male patient reported with the chief complaint of pain in the right lower back tooth for the past 1 week.

History: Pain was moderate, intermittent and aggravates while chewing and biting.

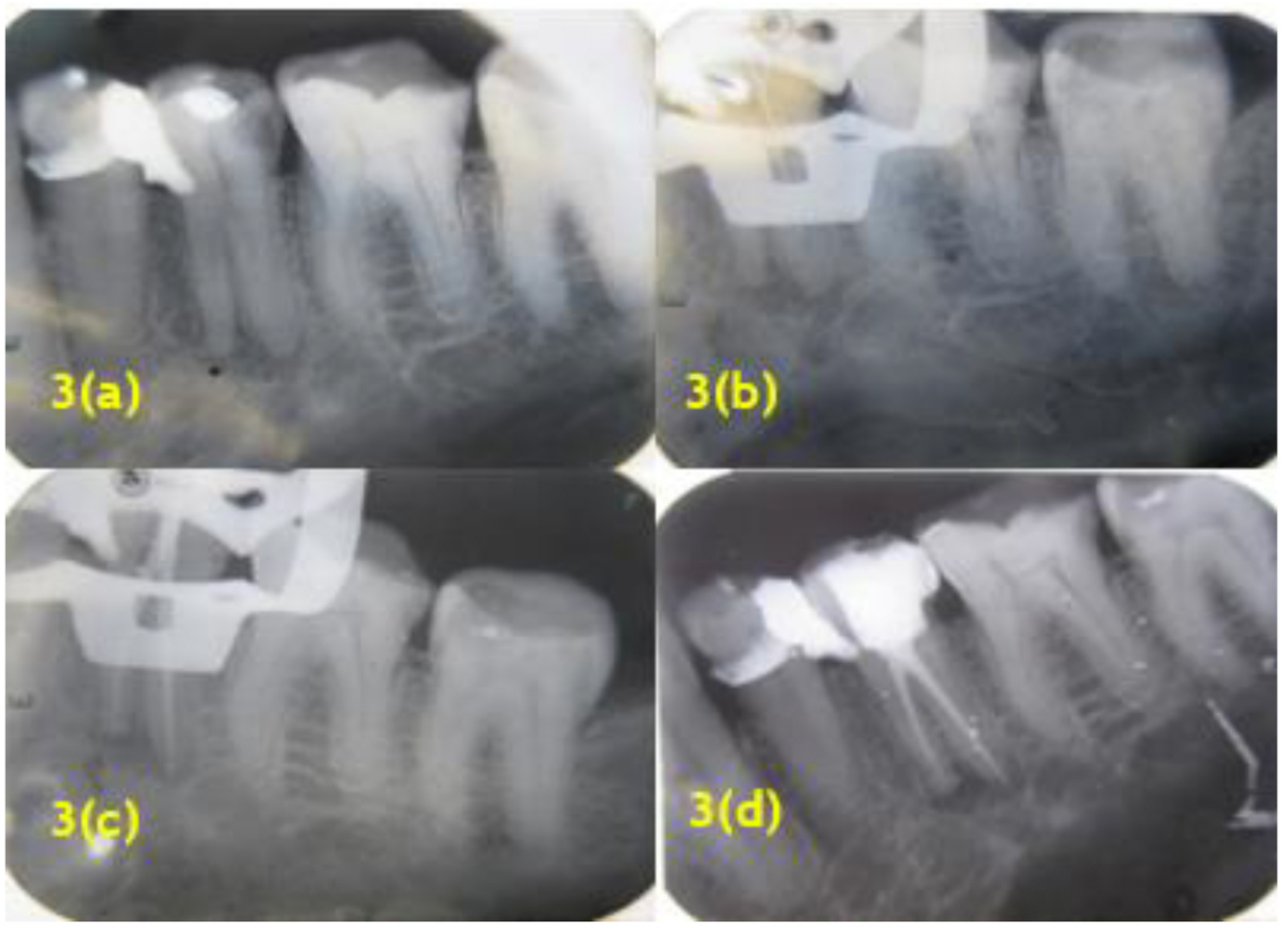
Clinical examination: Silver amalgam restoration in 35 with tenderness on percussion in 35.

Radiographic examination: Radiopacity approximating the pulp space in 35 and radiolucency beneath the radioapacity suggestive of secondary caries. Presence of two roots – mesial and distal and haziness of lamina dura around the apical third of 35(Fig 3.a).

Diagnosis: Dental caries in 35 with symptomatic apical periodontitis.

Treatment plan: Root canal treatment in 35

Procedure: Under LA with Adrenaline (2% Lignocaine with 1:80000 Adrenaline), access opening was done in 35. Mesial and distal canals were located and negotiated. Working length was determined



using electronic apex locator and confirmed with a diagnostic radiograph (Fig 3.b). The working length was measured as 18.5 mm in the mesial canal and 19 mm in the distal canal. Cleaning and shaping was done manually in 45 upto K file no 40 instrument using 3% NaOCl and normal saline as irrigants and obturation was done with no 40 size master cone gutta percha (Fig 3.c) and cold lateral condensation techniques using Zinc Oxide Eugenol sealer (Fig 3.d).

Conclusion:

According to Green the highest incidence (47%) of accessory foramina was observed in mandibular second premolars (1). Rahimi et al. also reported high incidence of lateral canals (38.7%) and apical delta (4.38%) in mandibular second premolars (2). Vertucci et al. reported that the mandibular second premolar had one root canal at the apex in 97.5% and two canals in only 2.5% of the teeth; however, three root canals were scarce (3). Zillich and Dowson found the incidence of three canals in mandibular second premolars to be 0.4%, which emphasizes the occurrence as being scarce (4). According to Slowey Mandibular premolars are the most difficult teeth to treat endodontically due to variations in canal anatomy, variations in internal morphology, extra root canals, apical deltas and lateral canals (5,6,7,8). Advanced imaging techniques like CBCT has made it possible to diagnose the complex root canal morphologies and treat them accordingly. However, these techniques should be used only when indicated considering the radiation exposure associated with CBCT. Our paper reported two cases where CBCT complimented root canal procedure and one case where the treatment was performed without the aid of CBCT. Thus the prudent use of the available technologies will aid in rendering a proper treatment and improve the overall success rate of the tooth in the long term basis.

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