International Journal of Enhanced Research in Medicines & Dental Care (IJERMDC),
ISSN: 2349-1590, Vol. 5 Issue 10, October-2018, Impact Factor: 3.015

Surgical management of lateral incisor with two roots combined with peripical pathology using platelet rich fibrin with the help of cone beam computed tomography: A case report

Pragnesh D. Parmar[1], Ramandeep Kaur[2], Natwar Singh[3]

[1]MDS, Department of Conservative Dentistry &Endodontics, Post Graduate, Institute of Dental Sciences (PGIDS),Rohtak (Haryana), India
[2] Post graduate student, Department of Periodontology, Government Dental College & Hospital, Amritsar (Punjab), India
[3]Post graduate student, Department of Conservative Dentistry &Endodontics, Post Graduate Institute of Dental Sciences (PGIDS), Rohtak (Haryana), India

ABSTRACT

An accurate diagnosis of the morphology of the root canal system is a pre-requisite for successful root canal treatment. Frequently, root canals are left untreated because the clinicians fail to identify their presence, particularly in teeth that have anatomical variations or additional root canals. In this report a maxillary lateral incisor with two roots has been described.Periapical pathology was not healed with conventional endodontic treatment so surgical approach was planned and platelet rich fibrin was used to cover the defect. 1 year follow up examination revealed complete healing of the defect after resectinf short extra infected root.

Keywords: lateral incisor, root anomaly, platelet rich fibrin, cone beam computed tomography, apical surgery, mineral trioxide aggregate.

INTRODUCTION

Many anatomical studies have declared that maxillary incisors always have a single root, while variations in the number of lateral canals and/or position of apical foramen are reported[1-5]. As indicated in the studies of canal anatomy, multiple canals and roots in maxillary incisors are rare[6-12].A brief literature review revealed 11 cases reporting maxillary lateral incisors with two roots[5,9-18] , 7 cases presenting maxillary central incisors with two roots[19-25] and 4 cases with two root canals in maxillary incisors[26-29].

Neville et al. used the term supernumerary roots when describing the presence of additional roots on a tooth compared with the classical description in dental anatomy. The most frequently affected teeth are the permanent molars (especially the third molar) from either arch and mandibular cuspids and premolars[30].Periapical radiography is an essential tool in diagnosing internal anatomy of a tooth. The use of shift cone angle radiographic technique and parallel angle radiograph to identify superimposed roots and overlapping and unidentified canals has been advocated. In this case report, a rare case of maxillary lateral incisor with two roots is described.

CBCT is essential tool in determining the extent of apical pathology, number of root canals, proximity of adjacent vital structures, to determine the shape structure of tooth anomaly, etc. Platelet rich fibrin (PRF) is an autogenous biomaterial consisting of growth factors and cytokines entrapped in a fibrin matrix. It combines the vibrant sealant properties along with growth factors thereby providing an ideal environment for wound healing and regeneration of tissues.

CASE REPORT

A 24 year old male came to department of conservative dentistry and endodontics with chief complain of pain in relation with maxillary left lateral incisor since last two month. Clinical examination revealed sinus formation and tender on percussion left lateral incisor. Periapical radiography with rvg revealed two roots and large periapical pathology (Fig. 1A). Sinus tracing revealed infection in extra root (Fig.1B). Primary periodontic with secondary endodontic involvement diagnosis was made. Conventional endodontic treatment initiated under rubber dam, both canal negotiated and obturated (Fig. 1C) with guttapurcha and patient was kept on regular follow up.

Figure 1: A-pre-operative radiograph, B-sinus tracing, C-obturation of both root,

Before obturating the root both were disinfected with 5% hypochlorite and calcium hydroxide dressing was given 3 times changing every week. After 3 month of follow up patient still complained about vague non-specific symptoms and sinus infection still not completely healed. So cone beam computed tomography (Fig. 1D) of same was indicated. After consultation with periodontist it was decided to resect the extra root and sealed with composite as the site remained the source of bacteria and infection, periapical root resection was also planned and root end was decided to be filled with mineral trioxide aggregate. Full muco-periosteal flap was reflected under local anaesthesia with adrenaline (1:80,000) and pathology was removed (Fig. 1E-1F).

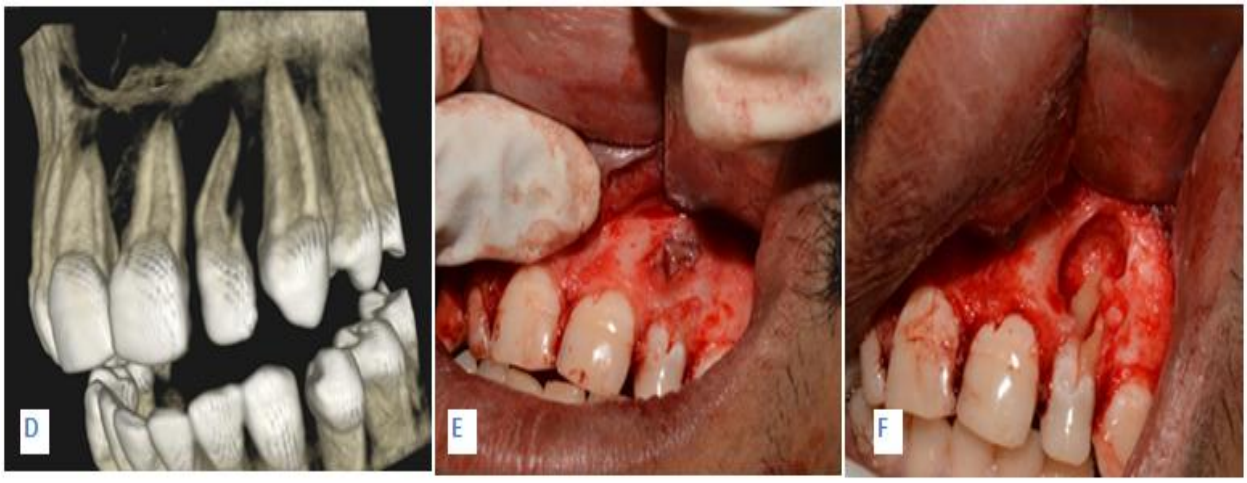

Figure 1: D-cbct 3D reconstructive view, E-full muco-periosteal flap reflection, F-complete removal of pathology,

Extra root was resected up to bone level and sealed with composite material. 3 mm resection was done for main root and retro-filling was done with MTA (Fig. 1G). Palatal flap was also reflected to fill the shallow palato-gingival groove with composite material (Fig. 1H). PRF was made by taking 10 ml of patient blood and centrifuged at 3000/min in machine and applied over buccal surface of root for regeneration of tissue (Fig. 1I-1J). 6 month follow up radiograph suggested complete healing of periapical and sinus pathology (Fig. 1K-1M).

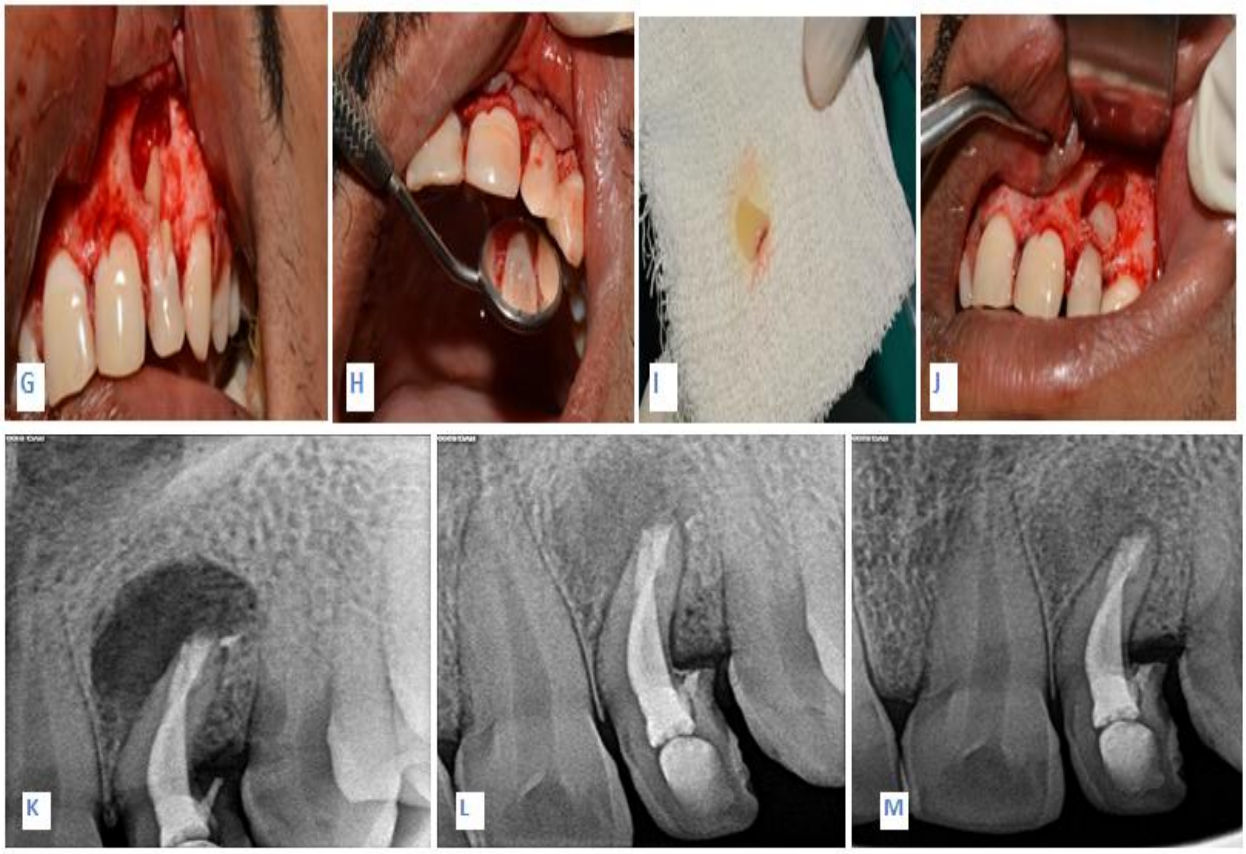

Figure 1: G-resection of both root, H-palatal crevicular flap reflection without vertical incision, I-platelet rich fibrin, J-application of PRF on root, K-1 month post op x-ray, L-3 month post op x-ray, M-6 month follow up x-ray.

DISCUSSION

When a maxillary incisor presents with two roots or two root canals, conditions such as fusion, gemination, dens in dente, palatogingival or distolingual groove and some variation in the normal development of Hertwig's epithelial root sheath must be considered[18,27,30].

Gemination is an anomaly in which the tooth germ divides during the development of the tooth, resulting in the formation of a double crown with single root, and in the case of fusion, the crown of two separate tooth buds fuse during development resulting in a bifid crown with two root canals in one root. In this case clinical examination as well as the pre-treatment radiographs revealed a crown of normal size and shape when compared with the contra lateral side. Therefore a diagnoses of fusion (single larger crown) or germination (fused or joined crown) can be disregarded[29-30].

There are few reports of maxillary lateral incisor with dens in dente and dens invaginatus showing two roots[5-11]. In the present case the pretreatment radiograph showed no evidence of enamel or dentinal invagination, thus making dens in dente or dens invagination unlikely causative factors.Another developmental anomaly, which may appear similar to this case radiographically, is palatogingival or distolingual groove and clinical examination revealed shallow groove extending from below cingulum to the bifurcation of the root[18,27]. According to Bhasker[30] normal root development occurs when Hertwig's root sheath is horizontally bent at the cementoenamel junction to narrow the cervical opening of the tooth germ. In this case report the clinical crown has normal shape (identical to left maxillary central incisor), it seems that during the epithelial diaphragm formation some incident caused the development of a horizontal flap of the Hertwig's epithelial root sheath, and then the horizontal flap fused, resulted in the formation of a second root. The slight depression which is present at the mesiobuccal cervical portion of this tooth seems to be the bifurcation area[31]. As there were no signs of caries or history of trauma, periapical infection might be due to perio-endo communication. The extra root served as harbor site of bacteria and this infection might reached to apical area and made the tooth non-vital.The use of PRF as an adjunct in wound healing and periodontal regeneration has shown promising results. It has been successfully used for correction of osseous defects in

periodontics, oral and maxillofacial surgery and implant dentistry. In addition to these, PRF has shown good results in regeneration of pulp-dentin complex for endodontic procedures.

CONCLUSION

Short term follow up of 6 month in this study suggested successful healing of periapcal as well as extra root related infection. PRF still remains viable option treatment for tissue regeneration in such cases.

ACKNOWLEDGEMENTS

The authors reported no conflicts of interest related to this study.

REFERENCES

[1] Black G. Descriptive anatomy of the human teeth. 4th Edition. Philadelphia: The S.S. White Dental Manufacturing Co; 1897. pp. 115–6.
[2] Green D. A stereomicroscopic study of the root apices of 400 maxillary and mandibular anterior teeth. Oral Surg Oral Med Oral Pathol. 1956;9(11):1224–32.
[3] Pineda F, Kuttler Y. Mesiodistal and buccolingualroentgenographic investigation of 7,275 root canals. Oral Surg Oral Med Oral Pathol. 1972;33(1):101–10.
[4] Vertucci FJ. Root canal anatomy of the human permanent teeth. Oral Surg Oral Med Oral Pathol. 1984;58(5):589–99.
[5] Collins IJ. Maxillary lateral incisor with two roots. AustEndod J. 2001;27(1):37–8.
[6] Yoshikawa M, Hosomi T, Sakiyama Y, Toda T. Endodontic therapy for a permanent maxillary lateral incisor having two roots. J Osaka Dent Univ. 1987;21(2):87.
[7] Fabra Campos H. [Upper lateral incisor with 2 canals]. Endodoncia. 1991;9(2):104–8.
[8] Zillich RM, Ash JL, Corcoran JF. Maxillary lateral incisor with two roots and dens formation: a case report. J Endod. 1983;9(4):143–4.
[9] Platt JA. A two-rooted maxillary lateral incisor. Gen Dent. 1995;43(1):72.
[10] Vire DE. Two-rooted maxillary lateral incisor. Oral Surg Oral Med Oral Pathol. 1985;59(3):321.
[11] Fried I, Winter A. Diagnosis and treatment of a two-rooted maxillary lateral incisor. Periodontal Case Rep. 1984;6(2):40–4.
[12] Sykaras SN. A two-rooted maxillary lateral incisor. Oral Surg Oral Med Oral Pathol. 1972;34(2):349.
[13] Ravindranath M, Neelakantan P, SubbaRao CV. Maxillary lateral incisor with two roots: a case report. Gen Dent. 2011;59(1):68–9.
[14] Sabala CL, Roane JB. Beware the maxillary lateral incisor. J Okla Dent Assoc. 1986;76(4):36–7, 40.
[15] Greenfeld RS, Cambruzzi JV. Complexities of endodontic treatment of maxillary lateral incisors with anomalous root formation. Oral Surg Oral Med Oral Pathol. 1986;62(1):82–8.
[16] Low D, Chan AW. Unusual maxillary lateral incisors: case reports. AustEndod J. 2004;30(1):15–9.
[17] Gandhi A, Kathuria A, Gandhi T. Endodontic-periodontal management of two rooted maxillary lateral incisor associated with complex radicular lingual groove by using spiral computed tomography as a diagnostic aid: a case report. IntEndod J. 2011;44(6):574–82.
[18] Lambruschini GM, Camps J. A two-rooted maxillary central incisor with a normal clinical crown. J Endod. 1993;19(2):95–6.
[19] Patterson JM. Bifurcated root of upper central incisor. Oral Surg Oral Med Oral Pathol. 1970;29(2):222.
[20] Heling B. A two-rooted maxillary central incisor. Oral Surg Oral Med Oral Pathol. 1977;43(4):649.
[21] Michanowicz AE, Michanowicz JP, Ardila J, Posada A. Apical surgery on a two-rooted maxillary central incisor. J Endod. 1990;16(9):454–5.
[22] Rao Genovese F, Marsico EM. Maxillary central incisor with two roots: a case report. J Endod. 2003;29(3):220–1.
[23] Gonzalez-Plata RR, Gonzalez-Plata EW. Conventional and surgical treatment of a two-rooted maxillary central incisor. J Endod. 2003;29(6):422–4.
[24] Drent T, de Baat C. A two-rooted maxillary incisor. Ned TijdschrTandheelkd. 2006;113:33–5.
[25] Hatton JF, Ferrillo PJ, Jr. Successful treatment of a two-canaled maxillary lateral incisor. J Endod. 1989;15(5):216–8.
[26] Hosomi T, Yoshikawa M, Yaoi M, Sakiyama Y, Toda T. A maxillary central incisor having two root canals geminated with a supernumerary tooth. J Endod. 1989;15(4):161–3.
[27] Cimilli H, Kartal N. Endodontic treatment of unusual central incisors. J Endod. 2002;28(6):480–1.
[28] Cabo-Valle M, Gonzalez-Gonzalez JM. Maxillary central incisor with two root canals: an unusual presentation. J Oral Rehabil. 2001;28(8):797–8.
[29] BW Neville DD, CM Allen, JE Bouquot. Oral and maxillofacial pathology. 2th Edition. Philadelphia: W.B. Saunders; 2002. p. 88.
[30] Bhasker S. Orban's oral histology and embryology. 8th Edition. St. Louis: CV Mosby Co; 1976. p. 37.
[31] Khojastehpour L, Khayat A. Maxillary central incisor with two roots: A case report. Journal of Dentistry of Tehran University of Medical Sciences. 2005;2(2):74–7.