EGYPTIAN DENTAL JOURNAL

Volume 53, Number 4, October, 2007

Official Journal of the Egyptian Dental Association

EDA website: www.eda-egypt.org

Egyptian Dental Journal, 53, 2535:2538, October, 2007

MANDIBULAR CANINE WITH TWO ROOT CANALS

Hanan A. Balto* and Mona AL-Wakeel**

ABSTRACT

Endodontic failures can occur as a result of failure to locate, clean, and shape or fill the complete root canal system. This report describes a case of mandibular canine with inadequate root canal treatment. Diagnostic radiograph demonstrated the presence of two canals with type IV pattern, short filling in one of the canals and post in the other one. Endodontic retreatment was planned and the tooth was restored with porcelain fused to metal bridge. The patient was observed for 6 months through clinical and radiographic examination and the tooth remained asymptomatic.

Keywords: Retreatment, mandibular canine, two roots

INTRODUCTION

One of the main objectives of nonsurgical endodontic treatment is the elimination of infections from the root canal system and the prevention of reinfection (Sjogren et al.1990). However, endodontic treatment can fail for many reasons, such as diagnostic errors, persistence of the infection in the root canal system, errors in debridement and shaping of the root canal systems, instrument fractures, and poor restoration. Thus, the thorough knowledge of root canal space anatomy is a basic prerequisite for the successful completion of endodontic treatment, especially in cases where extra root canals are expected (Nair et al.1990, Alapati et al.2006). Many investigators have reported on the anatomical variations associated with mandibular canines (Pineda &Kutler 1972, Green 1973, Vertucci 1974, Heling et al. 1995, Orguneser and Kartal 1998, D'Arcangelo et al.2001, Nandini et al.2005). Pecora et al (1993) studied the internal anatomy, direction, number of roots and size of 830 extracted human mandibular canines. They showed that %98.3 of these teeth presented a single root, with %92.2 presenting one canal and one foramen, %4.9 with two canals and one foramen, and %1.2 with two canals and two foramina. The incidence of two-rooted canines was low, %1.7. In mandibular canines, the percentage of having two canals that end in two separate foramina (type IV) is %5 according to Pineda and kuttler (%3 ,(1972 according to Green (1973), and %6 according to vertucci (1974). However, Caliskan et al. (1995) could not find any type IV teeth in their study. This case report describes endodontic retreatment of the mandibular canine with two roots.

* Assistant Professor, Department of Restorative Dental Sciences, College of Dentistry, King Saud University
** Intern Student, King Saud University

CASE REPORT

A 50 –year- old Saudi female presented to the College of Dentistry at King Saud University, Riyadh, KSA, complaining from moderate lingering pain and foul smell related to a defective bridge in teeth 34# &33#. Dental history revealed that the patient had root canal treatment in these teeth 6 months ago and were restored with a bridge. Medical history of uncontrolled diabetes was reported by the patient. The clinical examination revealed moderate generalized periodontitis, and defective bridge in teeth 34# & 33#. The diagnostic radiograph (taken from mesial angulation) did not demonstrate periapical pathology, but revealed inadequate root canal treatment. Careful examination of the diagnostic radiograph demonstrated the presence of two canals with type IV pattern in tooth 33#, and inadequate root canal treatment (Fig.1).The treatment plan included removal of the defective bridge and endodontic re-treatment. Patient was advised to consult a physician in regards to her medical status before treatment was initiated. After her blood sugar was controlled, treatment was started. Local anesthesia was administered and the defective bridge was removed. Tooth 33# was isolated with a rubber dam, optimum access cavity was established, and two canal orifices were located. The gutta percha was removed with chloroform and H. file (Dentsply Maillifer, Switzerland) from the lingual canal, and the threaded post was retrieved from the buccal canal with a hemostat. Working length was established radiographically for both canals (Fig.2). Using step-back instrumentation technique and %1 sodium hypochlorite as an irrigant, the canals were instrumented with stainless steel k-files (Dentsply Maillifer, Switzerland), up to file # 40 for the buccal canal, and 35# in the lingual canal. The canals were obturated with gutta-percha and AH26 "silver free" sealer (De Tray Dentsply, Milford, DE, USA), using lateral cold condensation technique (Fig. 3). The tooth was restored with porcelain fused to metal bridge. The patient was observed for 6 months through clinical and radiographic examination and the tooth remained asymptomatic (Fig.4).

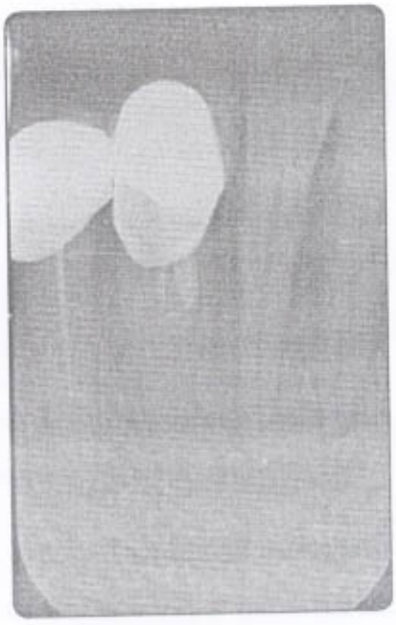

Fig (1): Preoperative radiograph, showed inadequate obturation in the lingual canal and short post in the buccal canal.

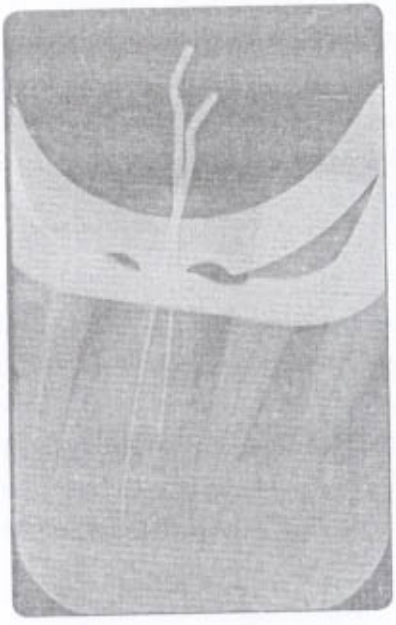

Fig (2): working length radiograph for the buccal and lingual canals

Fig (3): Final radiograph after obturation

Fig (4): Follow-up radiograph after -6month

DISCUSSION

Successful root canal therapy requires a thorough knowledge of root and root canal morphology. The anatomy of root canal systems dictates the condition under which root canal therapy is carried out and can directly affect its prognosis. Extra root or root canals if not detected are a major reason for failure of this treatment (Kaffe et al.1985). In endodontics, the possible existence of extra canals must be considered before endodontic treatment takes place. The clinician should have always in mind that failure to identify a second, third, or fourth canal might result in insufficient treatment and endodontic failure. Kaffe et al. (14) have carried out a retrospective review of 200 full mouth periapical survey including 400 mandibular canines. The survey included a conventional view of the canine tooth and a second view taken to show the adjacent premolar but that also included the canine (eccentric view). The percentage of canines with two canals shown on the standard X-ray was %7.5. Between %10.5 and %11 of the teeth appeared to have two canals when the eccentric radiographs were viewed. When both radiographs were viewed, %13.75 of the teeth were found to have two canals. Hence, viewing two films almost doubled the number of the teeth seen to have multiple canals. Also, there was no correlation found between the age of the patient and the number of the root canals seen for any of the mandibular incisor teeth and canines, studied. Laurichesse et al. (1986) reported that %2 of mandibular canines presented with one root and two canals and that %1 had two roots and two canals. In the present case, the preoperative radiographs made us suspicious of some anatomical complexity. The root system was characterized by a complete separation of the two canals, and that was confirmed by the previous treatment in which the gutta-percha and the post were located in a different direction. Several clinical indications may be useful in the detection of extra root canal in the mandibular canine. For example extra root canals could be suspected clinically when the pulp chamber does not appear to be aligned in its classical bucco-lingual relationship. In addition, if the pulp chamber appears to deviate from the normal configuration and seems to be either rectangular or too large in

a bucco-lingual plane, more than one canal should be suspected. Tactile examination of all the walls of the major canal with a small precurved K-file tip is recommended, in order to probe for a catch which may indicate the orifice of an additional canal. In addition to the clinical examination, radiographs exposed at two different horizontal angles and their careful interpretations facilitate the search for additional root canals (Walton 1973, Fava & Dummer 1997). Also, in order to improve the visualization, detection, and management of such root canal system, it is absolutely necessary to obtain optimum access cavity preparation.

CONCLUSION

Knowledge of anatomic variations is essential because endodontic success is related to a through debridement of the root canal system, making it mandatory towards multiple angled radiographs. The dentist should always have a mind set to look out for extra canals in all root canal cases. Finally, it is also important that the endodontic treatment be reviewed periodically to ensure continuous healing without complications.

REFERENCES

1. Alapati S, Zaatar EI, Shyama M, AL-Zuhair N. Maxillary canine with two root canals. Med Princ Pract 6-15:74 ;2006.
2. Caliskan MK, Pehivan Y, Sepetcioglu F, Turkun M. Root canal morphology of human permanent teeth in a Turkish population. J Endod 4-21:200 ;1995.
3. D'Arcangelo C, Varvara G, De Fazio p. Root canal treatment in mandibular canines with two roots: a report of two cases. Int Endod J 4-34:331 ;2001.
4. Fava LR, Dummer PM. Periapical radiographic techniques during endodontic diagnosis and treatment. Int Endod J 61–30:250 ;1997.
5. Green D. Double canal in single roots. Oral Surg, Oral Med, Oral Pathol 96-35:689 ;1973.
6. Heling I, Gottlieb-Dadon I, Chandler NP. Mandibular canine with two roots and three root canals. Endod Dent Traumatol 2-11:301 ;1995.
7. Kaffe I, Kaufman A, Littner MM, Lazarson A. Radiographic study of the root canal system of mandibular anterior teeth. Int Endod J 9-18:253 ;1985.
8. Lurichesse JM, Maestroni J, Breillat J. Endodontie Clinique 1 ,1986ª edn. Paris, France: Edition Cdp, 6-64.
9. Nandini S, Velmurugan N, Kandaswamy D. Bilateral mandibular canines with type two canals. Indian J Dent Res 70-16:68 ;2005.
10. Nair R, Sjogren U, Kreg G, Khanberg KE, Sandquist G. Intraradicular bacteria and fungi in root filled, asymptomatic human teeth with therapy- resistant periapical lesion: a long-term light and electron microscopic follow-up study. J Endod 8-580 :16 ;1990.
11. Orguneser A. and Kartal N. Three canals and two foramina in a mandibular canine. J Endod 5-444 :24 ;1998
12. Pineda F, KutlerY. Mesiodistal and buccolingual. Roentgenographic investigations of 7275 root canals. Oral Surg, Oral Med, Oral Pathol 10-33:101 ;1972.
13. Pecora JD, Sousa Neto MD, Saquy PC. Internal anatomy, direction, number of roots and size of human mandibular canines. Braz Dent J 7-4:53 ;1993.
14. Slowey RR. Radiographic aids in detection of extra root canals. Oral Surg, Oral Med, Oral Pathol -37:762 ;1974 71.
15. Sjogren U, Hagglund B, Sundqvist G, Wing K. Factors affecting the long term results of endodontic treatment. J Endod 504-16:498 ;1990.
16. Vertucci FJ. Root canal anatomy of mandibular anterior teeth. J Am Dent Assoc 71-89:369 ;1974.
17. Walton RE. Endodontic radiographic techniques. Dent Radiogr Photogr 9–46:51 ;1973.