

A Clinical Case Report of Endodontic Treatment of a 33-mm Length Maxillary Canine

¹Dr. Pradnya V. Bansode, Professor & Head of the Department, Department of conservative dentistry and endodontics, GDC & Hospital, Aurangabad/MUHS, India

²Dr. Seema D. Pathak, Professor, Department of conservative dentistry and endodontics, GDC & Hospital, Aurangabad/MUHS, India

³Dr. M.B. Wavdhane, Associate professor, Department of conservative dentistry and endodontics, GDC & Hospital, Aurangabad/ MUHS, India

⁴Dr. Rinky Hajong, MDS Student, Department of conservative dentistry and endodontics, GDC & Hospital, Aurangabad/MUHS, India

Corresponding Author: Dr. Rinky Hajong, MDS Student, Department of conservative dentistry and endodontics, GDC & Hospital, Aurangabad/ MUHS, India

Citation of this Article: Dr. Pradnya V. Bansode, Dr. Seema D. Pathak, Dr. M.B. Wavdhane, Dr. Rinky Hajong, “A Clinical Case Report of Endodontic Treatment of a 33-mm Length Maxillary Canine”, IJDSIR- January - 2021, Vol. – 4, Issue - 1, P. No. 167 – 170.

Copyright: © 2021, Dr. Rinky Hajong, et al. This is an open access journal and article distributed under the terms of the creative commons attribution noncommercial License. Which allows others to remix, tweak, and build upon the work non commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

Introduction- Permanent Maxillary Canine can present with an unusual length exceeding 31mm. This case report describes the root canal therapy of permanent maxillary canine with an unusual length.

Case Report: A 48 year old woman was reported to the department of Conservative Dentistry & Endodontics with pain on tooth #13. Endodontic treatment was performed and was found to have an unusual length of 33 mm. The use of alternative reference point was made to correspond the working length with the available endodontic instruments.

Conclusion- Successful Endodontic Treatment on extremely long tooth is suitable if modification in treatment plan procedures are utilized.

Keywords: Root canal anatomy, maxillary canine, root canal treatment.

Introduction

The success of endodontic treatment depends on the thorough knowledge and understanding of the detailed anatomy of the root canal system. The outcomes of the root canal treatment depends on the technical quality and rigorous allied of the principles and procedure to achieve the objectives of cleaning, shaping, and obturation.

Dental anatomy studies reported different mean lengths for different tooth types. Many studies and case reports

from the literature had investigated the length of human maxillary canine with normal mean lengths varying from 25 to 27.2 mm⁽¹⁻⁴⁾. In 1902, G.V Black stated that the longest maxillary cuspid was 32.0 mm,² while Bjorndal et al. reported the longest maxillary canine at 33.3 mm in 1974.³ In 1979, Wiene reported a surgically extracted human maxillary canine of 39.5 mm length.⁴ While in 1982, Gray came up with an extracted upper canine of 41mm.⁵ Also, a maxillary canine length of 47mm had been reported.⁶

Wilkie & Chambers suggested that tooth length was not necessarily related to height of the patient. However, in clinical practice, it is relatively common to face anatomical characteristics that differ from those described in the literature. Treatment becomes more difficult and complex in such cases, because of the unavailability of endodontic instruments longer than 31 mm commercially. Thus, we should focus on the use of alternative treatment techniques available utilizing the best of our clinical knowledge, with the aim of guaranteeing a successful endodontic treatment and respecting the biological and mechanical principles of endodontics.

This case report described non-surgical endodontic treatment of a maxillary cuspid tooth no. 13, 33 mm long with the emphasis on the alternative technique employed in the endodontic treatment.

Case Report

A 48 year old woman with a non-contributing medical history reported to the department with the chief complaint of pain on upper right canine which exaggerate on eating and on night. Clinical examinations revealed deep mesial caries w.r.t tooth #13. The tooth was sensitive to percussion and palpation and revealed no response to pulp vitality test. Periapical radiographs revealed periapical lesion and an irregular root morphology consisting of a very long root with an apparent length of

33 mm for tooth #13 [Figure 1]. Based on the clinical and radiographic findings and according to American Association of Endodontics (AAE), the tooth was diagnosed as necrotic pulp with symptomatic apical periodontitis. The treatment suggested to the patient was non-surgical root canal treatment w.r.t 13. After proper isolation using rubber dam application, access opening was initiated using endo access bur, then the patency of the canal was determined using a 31-mm long, pre-curved, K file size #10 (Dentsply, Ballaigues, Switzerland). Through the radiograph the estimated working length was 33 mm, but the longest files available were only 31 mm in length. Since the longest possible file (31 mm) was already in use. So, the palatal cingulum was considered as the reference point. By using the palatal cingulum as a reference point, the overall working length could be reduced by 5 mm and the 31 mm length files would be long enough for the appropriate cleaning and shaping of the root canal system. The working length from the cingulum reference point was established using Root ZX (J. Morita, Tokyo, Japan) electronic apex locator and confirmed radiographically [Figure 2].

The canal was prepared with hand K files (NiTi k files, Dentsply-Maillefer, Ballaigues, Switzerland) using step-back technique. Copious irrigation with 2.5% sodium hypochlorite (NaOCl) followed by 17% ethylenediaminetetraacetic acid (EDTA) was carried out during the instrumentation phase. After completion of chemo-mechanical preparation, the canal was dried using absorbent paper points. Intracanal medication of Calcium hydroxide dressing (calcetin in paste form) was given to enhance disinfection of the canal and the access cavity was temporized. After fifteen days, the obturation procedure was carried out. Master-cone radiograph was taken (Figure 3). The root canal was dried with sterile paper points and filled with cold lateral compaction

technique by gutta-percha cones (Dentsply, Ballaigues, Switzerland) using sealapex sealer (Kerr, SybronEndo,). Post Obturation radiograph was taken (Figure 4). The access cavity was sealed with temporary filling material and the patient was recalled to receive final restoration after seven days. Radiograph was taken (Figure 5).



Figure 1



Figure 2



Figure 3



Figure 4



Figure 5

Discussion

Instrumentation of upper cuspids longer than 32 mm long is extremely difficult because of the size of the instruments commercially available. In spite of the difficulties faced in clinical practice, the present discussion will focus on the characteristics of the alternative treatment technique used which allowed preservation of the crown and may therefore be useful to treat other similar cases

It is widely known that the maxillary canines are the longest teeth in the human dental arch. The cleaning and shaping of maxillary canines longer than 32 mm long is

extremely difficult because of the size of the instruments commercially available.⁷ In root canal treatment of teeth with this length, some modifications must be made in the treatment technique due to restrictions in length of instruments available.⁸

Studies such as that of Zmener et al.⁹ leave no doubt those professionals should be ready to deal with such cases in the clinical practice, emphasizing the need for good radiographs before endodontic treatment. In the present case, a conservative technique was employed because the tooth presented an intact crown, with no need for prosthetic rehabilitation. Therefore, instead of damaging the crown in order to reach the ideal working length, it was decided to change the traditional reference point, adopting the cingulum or cervical limit of the access cavity as reference point .

Zmener et al.¹⁰ reported that from 280 human maxillary teeth extracted at several Argentinean hospital services, 13.21% of the teeth observed were longer than 31 mm, with higher lengths in teeth with curved canals, which is in accordance with the present case report

It is important to point out that Maillefer (Dentsply, Ballaigues, Switzerland) produces the Vetinox series of endodontic instruments, designed for veterinary use, with higher lengths, reaching 40 mm and even 60 mm.⁷ Endodontic treatment of longer teeth that can be successful if suitable modifications in treatment procedures are utilized.

Conclusion

The use of an alternative reference point, located at the palatal cingulum proved to be an appropriate approach in this case. The alternative technique not only provided adequate disinfection, preparation and filling of the root canal, but it also allowed preservation of the remaining tooth structure. Therefore, it is strongly suggested that the

technique described could be considered in the endodontic treatment of cuspids with lengths above 31 mm.

References

1. Estrela C, Zina O. Morfologia interna e abertura coronária. In: Estrela C, Figueiredo JAP. Endodontia: princípios biológicos e mecânicos. São Paulo: Artes Médicas; 1999. p. 451-92.
2. Leonardo MR. Meios químicos. In: Leonardo MR, Leal JM. Endodontia: tratamento de canais radiculares. 3rd ed. São Paulo: Panamericana; 1998. p.191-214.
3. Soares IJ, Goldberg F. Endodontia: técnica e fundamentos. Porto Alegre: Artmed; 2001.
4. Vargo JW, Hartwell GR. Modified endodontics for lengthy canals. J Endod 1992;18:512-4.
5. Zmener O. Caninos extra largos: revisión de la literatura y presentación de un caso. Endodencia 2003;21:151-3.
6. Weine FS. A very long cuspid! J Endod 1986;12:80-1.
7. Barletta FB, Grecca FS, Wagner MH, Ferreira R, Lopez FU. Endodontic treatment of a 36-mm long upper cuspid: clinical case report. Revista Odontol Ciência 2010;25:412-16.
8. Vargo JW, Hartwell GR. Modified endodontics for lengthy canals. J Endod 1992;18:512-14.
9. Pécora JD, Neto MDS, Silva RG. Revisão da anatomia interna dos dentes humanos. [Accessed on 2009 Apr 14].
10. Zmener O, Macchi RL, Banegas G. Caninos extralargos: análisis de su frecuencia e inconvenientes para el tratamiento endodóntico. Rev Asoc Odontol Argent 2005;93:13-16.