http://dx.doi.org/10.5272/jimab.2014203.529

Journal of IMAB
ISSN: 1312-773X (Online)
http://www.journal-imab-bg.org

OPEN ACCESS

Journal of IMAB - *Annual Proceeding (Scientific Papers)* 2014, vol. 20, issue 3

UNUSUAL CASE OF A MAXILLARY FIRST INCISOR WITH TWO ROOT CANALS

Janet Kirilova[1], Snezhanka Topalova-Pirinska[1], Elitza Deliverska[2],
1) Department of Conservative Dentistry,
2) Department of Oral and Maxillofacial Surgery,
Faculty of Dental Medicine, Medical University, Sofia, Bulgaria

ABSTRACT

Introduction: Maxillary central incisors usually have one root with one root canal. The cases with two root canals are extremely rare.

Purpose: The aim was to present an unusual case of a maxillary first incisor with two root canals and the methods of treatment**.**

Material and methods: The 48-year old patient had a painful swelling above the first maxillary incisor. The diagnosis was Periodontitis chronica granulomatosa diffusa exacerbata. After exploration of the pulp chamber, the inspection with an operating microscope was found two root canals. The lesion *was* covered to periapical and the part of marginal periodontium. The decision was taken of combined endodontic and surgery treatment.

Results and discussion: After 7-year follow-up, there was a healing of the lesions and no recurrence.

Conclusions: The combined endodontic and surgery treatment was successful choice for preservation of the tooth.

Key words: maxillary first incisor, two root canals

Usually the maxillary central incisor has one root and one root canal. Cases with two or more root canals are considered extremely rare[3, 4, 8]. In dental literature there are a few cases connected to root aberations like taurodontism, dens evaginatus, etc. [1, 3, 5].

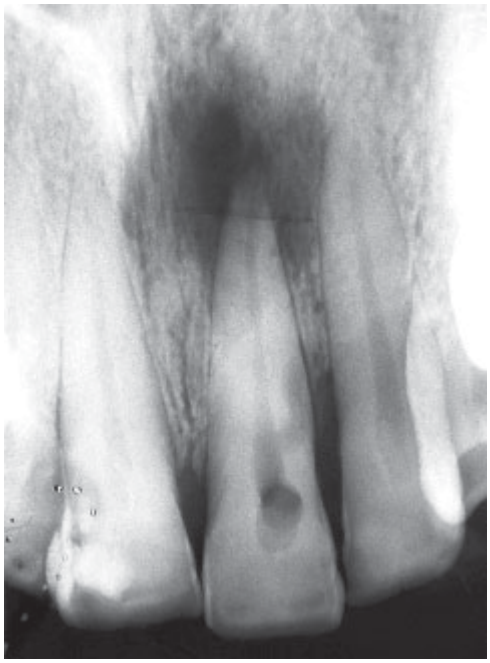
The aim of this presentation was to describe the combined treatment of a maxillary central incisor with 2 root canals.

MATERIAL AND METHODS

The 48-year old patient had a painful swelling above the first maxillary incisor. The diagnosis was Periodontitis chronica granulomatosa diffusa exacerbata. After exploration of the pulp chamber, the inspection with an operating microscope was found two root canals. Endodontic treated first upper left incisor had signs of chronic periapical perodontitis with fistula and second incomplete root canal. It was located labio-distally from the main root canal. His length was 5-6 ìì (figures 1 and 2). The X-Ray of the tooth (figure 2) shows an periapical lesion PAI 5 according Ørstavik [7].

Fig. 1. Maxillary left central incisor with opened pulp chamber and two widened orifices.

Fig. 2. X-Ray of maxillary left central incisor with two root canals.

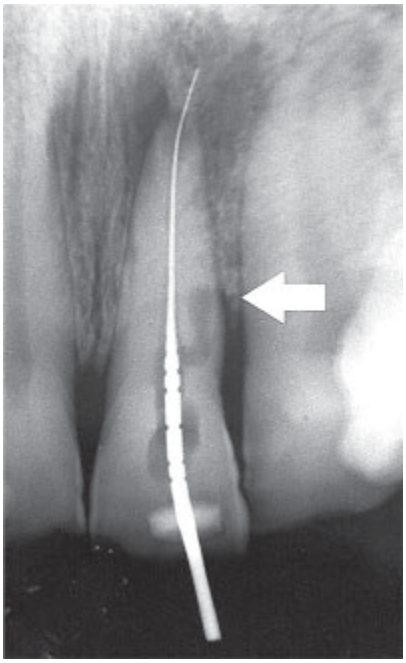


Endodontic treatment

The radiograph was made to measure the length of the root canal. There was a marginal periodontitis connected

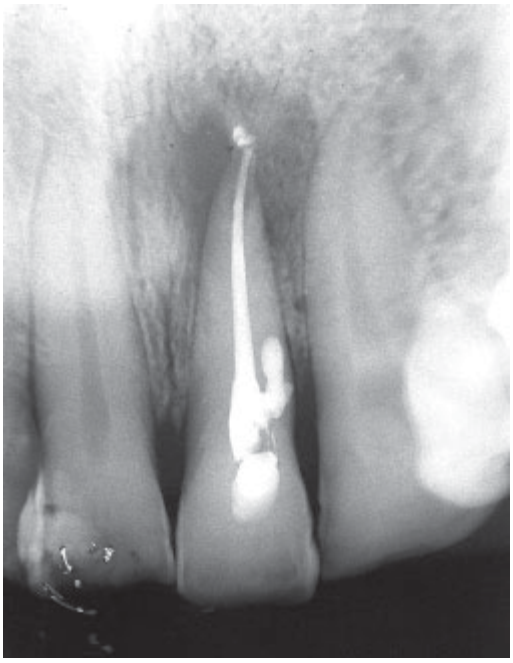
to the second canal. It was located distally and labially of the surface of the root (figure 3).

Fig. 3. X-Ray determination of working length of the maxilllary central incisor with two canals.



The endodontic-surgical treatment was conducted, because of the pathological changes of the apical and a part of the marginal periodontium. The root canals were shaped with the crown-down technique and rotary nickel-titanium instruments and the main root canal was filled with Thermafil and a sealer. The second root canal was filled with warm condensation technique (figure 4).

Fig. 4. Root canal filling of the maxillary central incisor with two canals.



Surgical treatment

Before surgery, patient rinsed with an antiseptic mouthwash containing 0.2% chlorhexidine digluconate for 30 seconds, aiming at reducing recontamination. Treatment was performed under local anaesthesia, induced with articaine 4% and epinephrine 1:100.000. The access flap was sulcular full thickness mucoperiosteal triangular flap with one vertical releasing incision. The full mucoperiosteal flap was mobilized, reflected and retracted carefully during the procedure. The flap was continuously irrigated to prevent dehydration of the periosteum. After complete reflection the surgical access to the lesion was obtained through a bur under copious irrigation with sterile saline solution. After complete removal of the lesion (periapical soft tissue), the management of the root-end was performed following the well known protocol (figure 5). Intraoperatively was observed a fenestration of the cortex in the periapical lesion (7-9mm wide).

Fig. 5. Surgical treatment of the maxillary central incisor with two canals.

A 3 mm apical tip has been removed so as to eliminate all accessory canals and expose isthmus, which eliminates the residual microorganisms. The angle of resection was at about 10° or near to perpendicular to the long axis of the tooth and this angulation decreases the number of dentine tubules communicating with periradicular region and root canals. After maintaining good haemostasis, the root-end was prepared with or with a bur in low speed handpiece. The cavity was dried with paper points and then filled with MTA (mineral trioxide aggregate).

Fig. 6. Surgical treatment of maxillary left central incisor with two canals. Resection of the apical part of the root.

MTA was applied at the lateral end of the second canal after cleaning the granulations (Figure 7).

Fig. 7. Surgical treatment of maxillary left central incisor with two canals. Application of MTA.

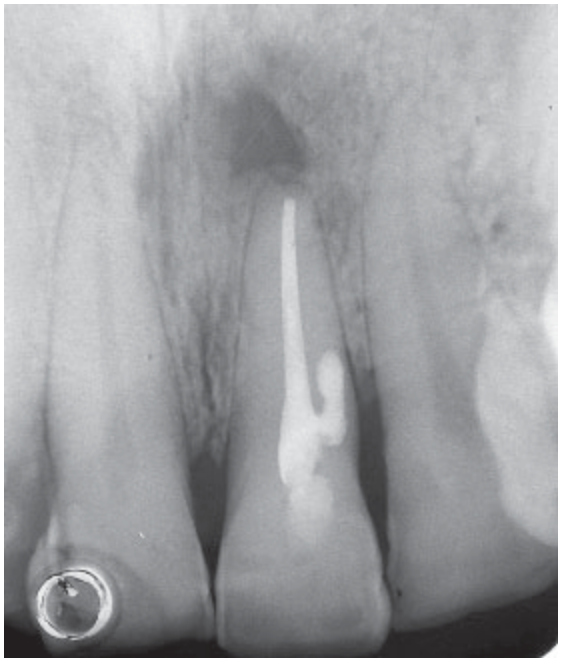
The operative site was debrided thoroughly, a strong irritating stream of saline and metronidazole is flushed through and aspirated from surgical area. The reflected tissues were re-approximated, compressed, stabilized and then sutured with polyamide suture.

The patient was instructed to avoid strongly mouth rinsing, hard and hot food eating, heavy physical activity and tooth brushing during the day of surgery. The patients were advised to rinse twice daily with chlorhexidine digluconate 0.2%, up to 10 days after surgery. Nonsteroidal anti-inflammatory drugs were prescribed for pain relief and swelling control. Antibiotic therapy was prescribed: Augmentin 2x1.0 for 5 days.

Sutures were removed 7 days after surgical intervention.

Patient did not suffer from any clinical complications. The radiograph showed a healing process, but probably due to the periapical lesion, there is no complete healing (figure 8).

Fig. 8. X-Ray control 8 months later.



Seven years later lesion didn't show radiographic signs of treatment failure.

RESULTS AND DISCUSSION

Even though these cases are rarely observed, when there are maxillary central incisors with two canals, they can be treated by the specialist. From 1970 to 2010 there are only 24 publications and almost all authors consider the difficult treatment of such teeth [2, 4, 5]. That is why we would like to remind all colleagues that X-Ray must be taken before to consider an endodontic treatment [8, 9].

In this case, we observed an interesting fact: the second root canal was a reason for pathological changes, which were situated marginally. That's why the treatment was combined endodontic and surgical.

Such a surgical approach aims at the regeneration of periapical tissue resulting in the formation of a new attachment apparatus, by exclusion of pathogenic agents within the physical confines of the affected root and by enucleation of the periapical lesion [6, 10, 11].

Indications for endodontic surgery are: failed non- surgical endodontic treatment (irretrievable root canal filling and irretrievable intraradicular post), calcific metamorphosis of the pulp stone, procedural errors (instrument separation, non negotiable ledging, root canal perforation, symptomatic overfilling), anatomic variations (root dilacerations, apical root fenestrations), biopsy, corrective surgery (root resorbtion, root caries, root resection)[6].

Contraindications include anatomic factors, periodontal status, medical factors. Periapical surgery includes curettage, biopsy, shaping and filling of root- end, corrective surgery and perforation repair (mechanical or resorptive- inter-

nal or external). Traditional periapical surgery includes retrograde apicoectomy with orthograde root canal filling and periapical curettage. Microsurgery is defined as a surgical procedure on exceptionally small and complex structures with an operating microscope. The microscope enables the surgeon to assess pathological changes more precisely and to remove pathological lesions with far greater precision, thus minimizing tissue damage during the surgery. The advantages of microsurgery include easier identification of root apices, smaller osteotomy and shallower resection. In addition, reveals anatomical details such as isthmuses, canal fins, micro fractures, and lateral canals. Combined with the microscope, the ultrasonic instrument permits conservative, coaxial root-end preparations and precise root-end fillings [6].

In oral surgery, flap design is dependent on local anatomical features that should be evaluated when planning the surgical procedure. In endodontic surgery many flap types were described to access the periapical lesion, aiming at proper visualization of the surgical site and to an adequate root-end management [12, 13].

According some authors root should be resected to the level of healthy bone since the portion of the root that extende into the decreased tissue was infected and the cementum was necrotic and according to the others it should be 2.5-3 mm of the apex [13]. The angle of resection should be about 10° or perpendicular to the long axis of the tooth and such angulation decreases the number of dentine tubules communicating with periradicular region and root canals. It also helps in obtaining good cavity preparation, reduces the forces acting in periapical region which prevents fracture, creates better environment for healing. The 45° bevel removes more root structures and increase the probability of overlooking important lingual anatomy. 10° bevel conserves the root structure maintains a better crown/root ratio and increases the ability to visualize important lingual anatomy. Root end preparation includes 3 mm depth preparation along the long axis of tooth. It can be done by ultrasonic tips, allowing a parallel preparation of the root-end cavity or with a bur in low speed handpiece under microscope view [6]. The technique of retrograde filling depends on accessibility of the root tip in operative side; presence of hazardous anatomic structures surrounding the surgical site, location, configuration and accessibility of the apical foramina in the resected root; filling materials to be used.

The most successful seal reported consists of orthograde filling of gutta- percha and cement completing the obturation of the canal to the root apex. For retrograde filling are used mainly MTA cement. Its setting pH is 12,5 and setting time is 2 hours and 45 min. Compressive strength of MTA is reported to be 40 MPa, immediately after setting and increasing to 70 MPa after 21 days[6].

CONCLUSIONS

Knowledge of dental anatomy is fundamental for proper endodontic practice. Radiograph can help indentifying abnormal tooth anatomy.The combined endodontic and surgery treatment was successful choice for preservation of the tooth.

REFERENCES:

1. Brito-Junior M, Camilo CC, Silva ALF, Sousa-Neto MD. Nonsurgical endodontic management of an unusual taurodont maxillary central incisor: An 18-month follow up. *ENDO.* 2012 Summer;6 (2):139-42.

2. Cabo-Valle M, Gonzalez-Gonzalez, JM. Maxillary Central Incisor with Two Root Canals: an unusual presentation. *J Oral Rehabil.* 2001 Aug:28(8):797-8. [PubMed] [CrossRef]

3. de Almeida-Gomes F, de Lima Guimaraes SNL, Maniglia-Ferreira C, Santos RA, de Vitoriano M, de Sousa BC. Two root canals in maxillary central incisor. *RSBO.* 2011 Jul;8(3):341-4.

4. Gupta B, Datta P, Datta S S. Management of Double Rooted Maxillary Central Incisor with Two Roots Canals. *Indian J Dent Education.* 2013 Jan-Mar;6(1):51-3.

5. Kavitha M, Gokul K, Ramaprabha B, Lakshmi A. Bilateral presence of two root canals in maxillary central incisors: A rare case study. *Contemp Clin Dent.* 2014 Apr-Jun;5(2): 282-6. [CrossRef]

6. Niemczyk SP. Essentials of endodontic microsurgery. *Dent Clin North Am.* 2010 Apr;54(2):375-99. [PubMed] [CrossRef]

7. Orstavik D, Kerekes K, Eriksen HM. The periapical index: a scoring system for radiographic assessment of apical periodontitis. *Endod Dent Traumatol.* 1986 Feb;2(1):20-34. [PubMed]

8. Sponchiado EK Jr, Ismail HA, Braga MR, de Carvalho FK, Simoes CA. Maxillary central incisor with two root canals: A case report. *J Endod.* 2006 Oct;32(10):1002-4. [PubMed] [CrossRef]

9. Todd HW. Maxillary right central incisor with two root canals. *J Endod.* 1976; 2(8):227.

10. van der Vyver PJ, Traub AJ. Maxillary central incisor with two root canals: a case report. *J Dent Assoc S Afr.* 1995 Mar;50(3):132-3. [PubMed]

11. Velvart P, Peters CI. Soft tissue management in endodontic surgery. *J Endod.* 2005 Jan;31(1):4-16. [PubMed]

12. Velvart P, Ebner-Zimmermann U, Ebner JP. Comparison of long-term papilla healing following sulcular full thickness flap and papilla base flap in endodontic surgery. *Int Endod J.* 2004 Oct;37(10):687-693. [PubMed] [CrossRef]

13. Von Arx T, Salvi GE. Incision techniques and flap designs for apical surgery in the anterior maxilla. Eur J Esthet Dent. 2008 Summer;3(2):110-26. [PubMed]

Please cite this article as: Kirilova J, Topalova-Pirinska S, Deliverska EG. Unusual case of a maxillary first incisor with two root canals. *J of IMAB.* 2014 Jul-Sep;20(3):529-532. doi: http://dx.doi.org/10.5272/jimab.2014203.529.

Received: 10/04/2014; Published online: 02/07/2014;

Address for correspondence: Dr Janet Kirilova, PhD
Department of Conservative Dentistry, Faculty of Dental Medicine
1, St. George Sofiiski Str., 1431 Sofia, Bulgaria
E-mail: janetkirilova@gmail.com,