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## Endodontic treatment of a maxillary first molar with four root canals using Revo-S file: A case report

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### Abstract

**Introduction:** Knowledge of the internal dental morphology is a complex and extremely important point for planning and performing of endodontic treatment.

**Case Report:** This is a clinical case of a second maxillary molar with four root canals using a new revo – s rotary file system.

**Discussion:** Successful root canal treatment depends on proper cleaning, shaping and compact filling of the root canal under aseptic conditions. With the use of a new file system revo s, a standard procedure can be carried out. Its asymmetrical section initiates a snake-like movement of the instrument inside the canal. Due to its high performance and simplicity of use, this sequence is adapted for most root canal anatomies.

**Conclusion:** Revo S is a n efficient file system which works in a cyclic way. Its cutting efficiency, clearance and cleaning enables the operator to perform function with less fatigue and preservation of dentinal walls.

**Keywords:** Root canal anatomy, maxillary molar, REVO S

### 1. Introduction

Knowledge of the internal dental morphology is a complex and extremely important point for planning and performing of endodontic treatment. The several anatomical variations existing in the root canal system may contribute for failure of root canal therapy.

Weine *et al.* observed that failures related to the mesiobuccal root of maxillary molars expose to danger the success of endodontic therapy and found that teeth with a fourth canal occurred more frequently than those with three canals (51,5% versus 48,5%). Hession compared the canal morphology before and after instrumentation and concluded that the number of canal usually equals the number of roots. The greatest variations observed were the presence of two canals in the mesiobuccal root of maxillary molars, canals in the furcation area and presence of lateral and accessory canals. [1, 2].

### 2. Case Report

A 23-year-old male reported to the Department of Conservative Dentistry & Endodontics with a chief complaint of food lodgement in the upper back tooth region. Pulp Vitality test indicated pulp necrosis. Neither fistulae nor edema was observed.

The preoperative periapical radiograph showed a small area of thickened periodontal ligament around the root apices and possibility for additional canal in MB root. (fig.1)



Fig 1: Preoperative Radiograph

A standard endodontic procedure was carried out after local anesthesia. A rubber dam was placed for endodontic access and the pulp chamber was exposed clearly. Examination of the pulp floor with an endodontic explorer revealed 3 distinct canals-MB, DB, and P canal. K-type flexofile were used for gross removal of pulp tissue in the three main canals. Exploration the area around MB canal with C file #10) on the imaginary line between the MB1 and P orifice. Continuing exploration of groove around MB2 orifice, approximately 1,5mm in palatal direction, it was located the MB3 orifice The conventional triangular access was modified to a trapezoidal shape to improve access to the additional canals. All canals were easily negotiated, and were chemo mechanical prepared by crown-down technique with 5.25% NaOCl, 17% EDTA and saline as irrigating solution.

After exploring the 5 canals with #06, #08, #10 C-files root canal access were prepared with #1, #2 and #3 RGG The working length was determinate by using apex locator-P=21mm, DB=22,5 mm, MB1=21mm, MB2=21,5mm, MB3=22mm., respectively. Apical preparation of the 3 mesiobuccal canals was completed after instrumentation with revo-s. Prepared canals were obturated using the lateral condensation technique and Ah Plus as a sealer. (fig. 2, 3)

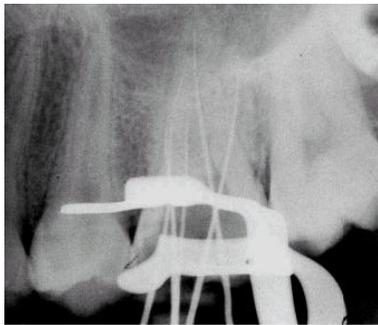


Fig 2: Establishing working length



Fig 3: Postoperative after obturation

### 3. Discussion

The variations in dental anatomy play an important role in root canal therapy. A great predominance of two very close canals in the mesiobuccal root of maxillary molars has been demonstrated. In the case reported in this paper, the mesiobuccal root presented a moderate curvature with three atresic canals. The mesiobuccal canal-1 had one opening and one exit (Vertucci's first class), while the mesiobuccal canal-2 and the mesiopalatal canal presented two openings and one exit (Vertucci's fourth class) [3, 4].

The instrumentation of these canals was carried out with REVO-S files. Its asymmetrical section initiates a snake-like movement of the instrument inside the canal. Due to its high performance and simplicity of use, this sequence is adapted for most root canal anatomies.

The instrument works in a cyclic way-cutting, clearance and cleaning. Initial penetration-The first step consists of an initial penetration of the canal using a conventional stainless steel hand instrument (usually a K file N°10 – MMC n°10 L21 mm) which provides information about the canal anatomy complementary to that obtained by the pre-operative X-rays. The instruments should be removed frequently from the canal and cleaned using a compress in order to eliminate the dentine debris.

Revo-S™ instruments should be used with a rotation speed ranging between 250 and 400 rpm. Use SC1 with slow and unique downward movement in a free progression and without pressure. Use SC2 with a progressive 3 wave movement (up and down movement). Use SU with a slow and unique downward movement in a free progression and without pressure. Then check apical patency and if necessary, perform an upward circumferential filing movement.

The canal should be thoroughly irrigated using sodium hypochlorite (2.5% to 5%) between the use of each instrument. The use of a chelating colloid (gel) is advised for instrument lubrication and dentine debris removal.

These instruments enable efficient widening of the apical preparation to .06 taper respecting the preparation performed with SC1, SC2 and SU. This finishing enables an improved flow of the irrigating solution promoting efficient disinfection and facilitated obturation.

The AS instruments should be used without apical pressure, after using the SU. If necessary and according to the root canal anatomy, use the AS30, AS35 and AS40 to enlarge the apical region. Their penetration depth corresponds to the working length. This length is shortened in thin root canals or with a marked curvature. They are then used in a step back motion (AS30 at WL, AS35 at WL -0.5 mm, AS40 at WL -1 mm if necessary). For a perfect apical finishing, use the sequence:

AS30 only for an apical finishing at 30/100, AS30 then AS35 for an apical finishing at 35/100. AS30 then AS35 and finally AS40 for an apical finishing at 40/100. If an AS instrument fails to reach the working length, continue the preparation using the former instrument in order to work without any apical pressure.

Endodontic research and technology are continually evolving to enable practitioners to identify, disinfect and obturate root canal system predictably and efficiently. Since the ultimate goal for patients and practitioners alike is the retention of natural teeth for a lifetime, endodontic therapy remains, and will continue to be, the primary treatment choice for teeth with pulpal and periradicular pathology.

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