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UNUSUAL CASE OF MAXILLARY SECOND MOLAR WITH THREE BUCCAL ROOTS AND CANALS – CASE REPORT

INTRODUCTION:

It is a well known dental fact that the maxillary second molar belong to a group of teeth with three roots, namely, mesiobuccal, distobuccal and palatal. However, the number of canals in these roots may differ, with usual being one canal in each root¹. The main objective of root canal therapy is complete healing of the diseased or infected tooth. This is achieved by complete elimination of bacteria their by-products, infected tissues with three dimensional well condensed obturation of the root canal and good coronal seal². Anatomic variation in the form of position of canal orifice and canal aberration is frequently encountered during routine endodontic therapy and these variations are quite prevalent in maxillary second molars³.

Pre-operative radiographs are very mandatory for endodontic procedures, which aids in identification of any existing pathology, extra roots, anomalies, assess surrounding periodontal support system which includes the alveolar bone. Radiographs taken at different angles helps us to confirm any variation that may exist. A clear knowledge and understanding about the root morphology will help us in achieving predictable prognosis⁴. Libfield and Rotstein⁵ in his study reported 0.4% incidence of four rooted maxillary second molars. Ahmed Fahid and Taintor⁶ presented a case report with two cases of second molars with three buccal roots. Osvaldo et al⁷ also reported three buccal roots in the maxillary second molars. The following clinical case illustrates a variation of the root canal anatomy of a maxillary second molar, where a four rooted maxillary second molar that has there separate buccal roots each containing one independent root canal.

CASE REPORT:

A 50 year old male with a non-contributing medical history was referred to our speciality clinic following a complaint of severe discomfort corresponding to the maxillary right second molar (tooth 17). Clinical examination revealed a fractured old silver amalgam filling on tooth 17. The same tooth was sensitive to percussion and reactive to temperature changes. The history, clinical signs and symptoms suggested a irreversible pulpitis. The radiographic examination revealed nothing unusual and presence of three roots were confirmed. The tooth 17 was prepared for root canal treatment, after administration of 2% lidocaine in 1:100,000 adrenaline (Xylocaine, Astra Zeneca Pharma India Ltd). The mesiobuccal (MB) and palatal canals were traced through conventional access opening. The access opening was modified and extended distally to trace the distobuccal (DB) canal. Closer examination of the mesial wall revealed few isolated bleeding points at the junction of the floor and wall. Further exploration with DG 16 (Hu Friedy, ChicagoIL), identified an orifice 3-4mm from the second MB canal. The access opening was extended more on the mesial side and extended mesiobuccally and the three orifices were located. This was not the normal or usual location of the DB canal.

The pulpal floor and wall was refined with ultrasonic tips (Dentsply), the floor was flooded with EDTA solution (Prime dental products Pvt. Ltd). The floor was inspected with higher magnification (19.2X), the canal was instrumented with size six and radiographs were taken. After completion and identification all three buccal canals (MB, MB2, MB3) were located in a straight line along the mesial buccal wall. Working lengths were estimated with help of Apex locator Root ZX (J Morita mfg corp, Kyoto, Japan.) and radiographs. Cleaning and shaping of the canals were completed and the canals were obturated (cold lateral condensation) with AH plus sealer (Dentsply Maillefer, Tulsa, USA) and 2%GP (Dentsply). Six months post operatively the tooth was asymptomatic and fully functional. The case presented herewith illustrates that an additional root canal containing an independent root canal is a possibility.



Fig: 1A. Preoperative OPG of Patient

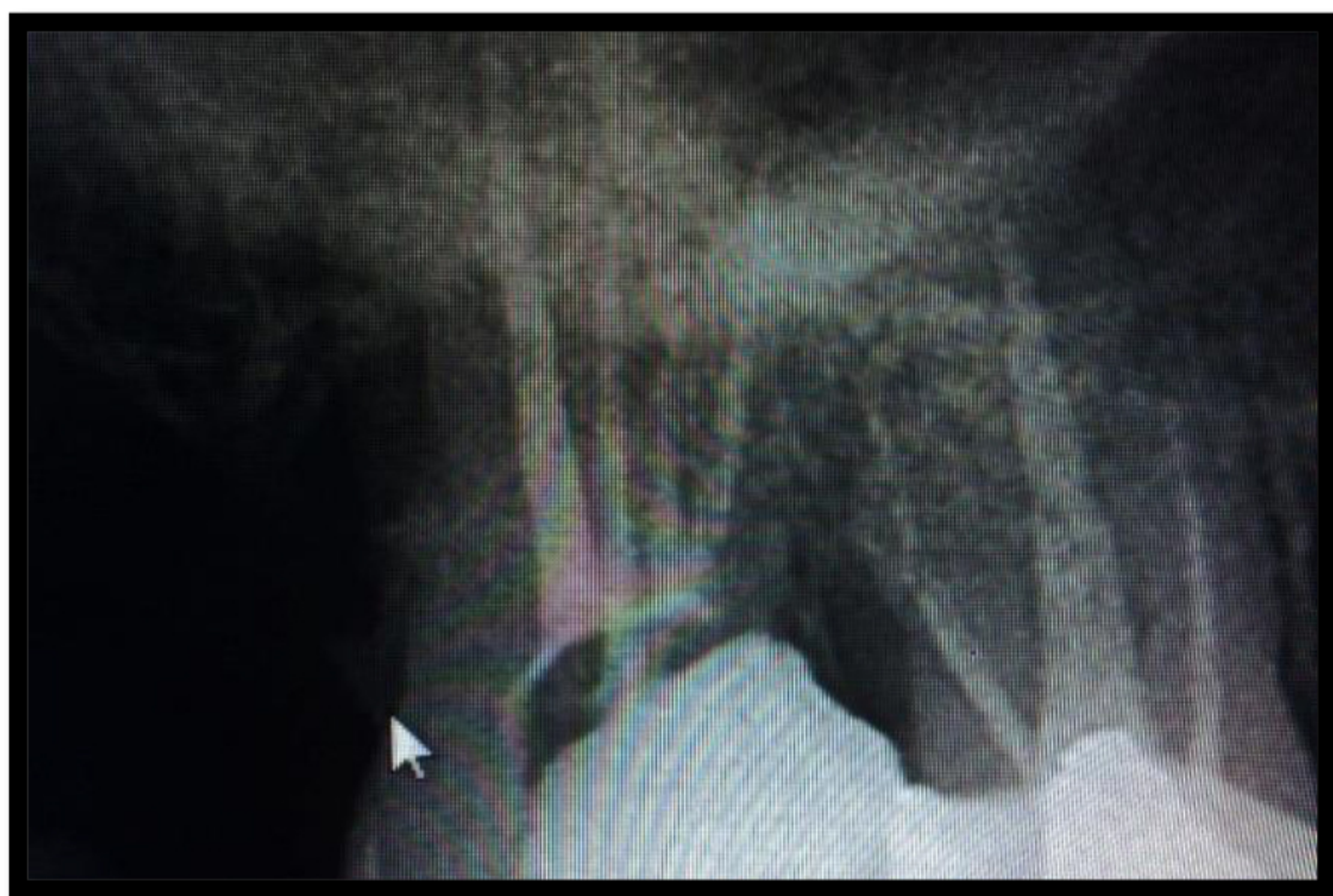


Fig:1B. Post obturation



Fig: 1C. 2yrs Follow-Up

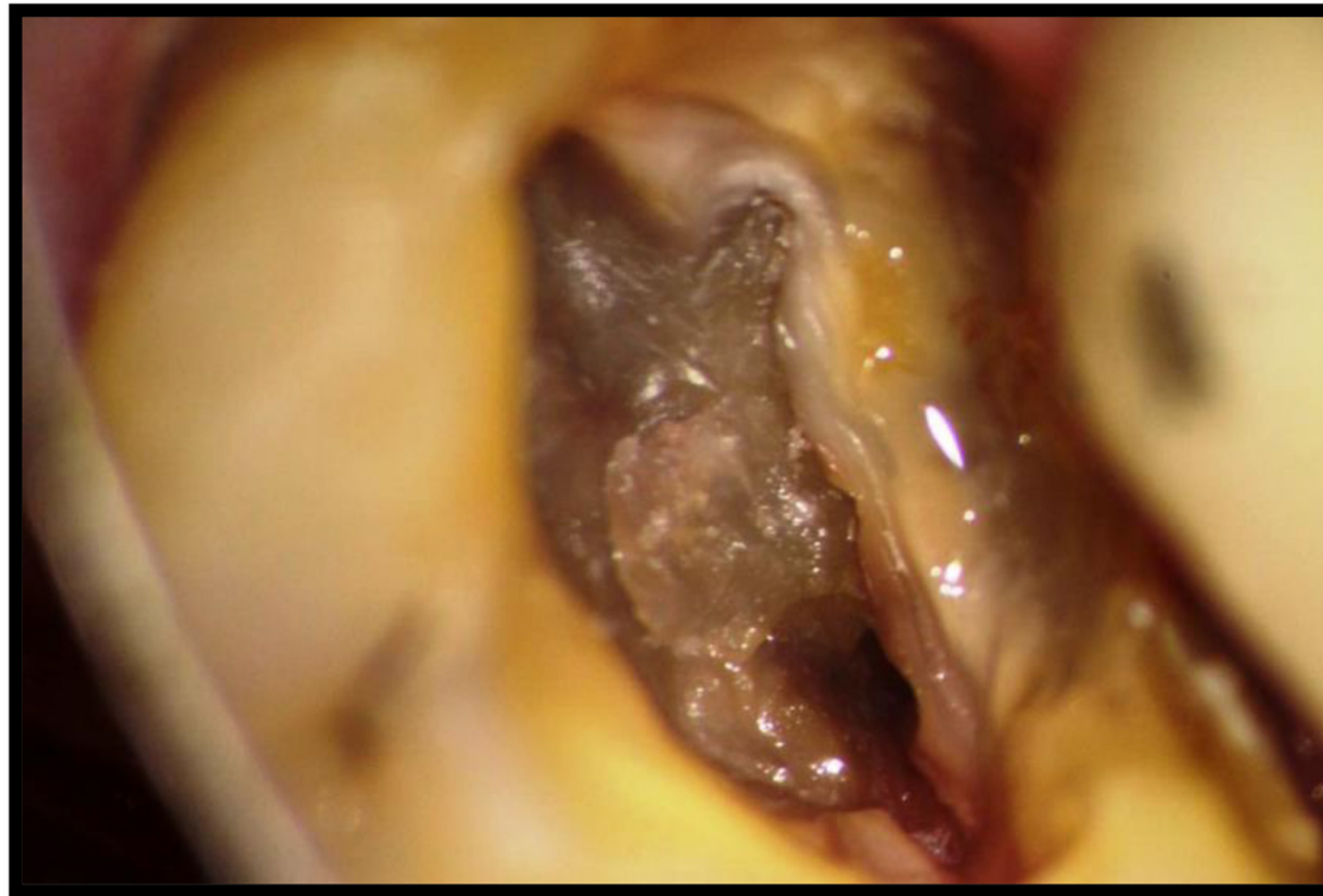


Fig: 2A. Access Opening Showing Pulp Stones & Positioning Of Orifices

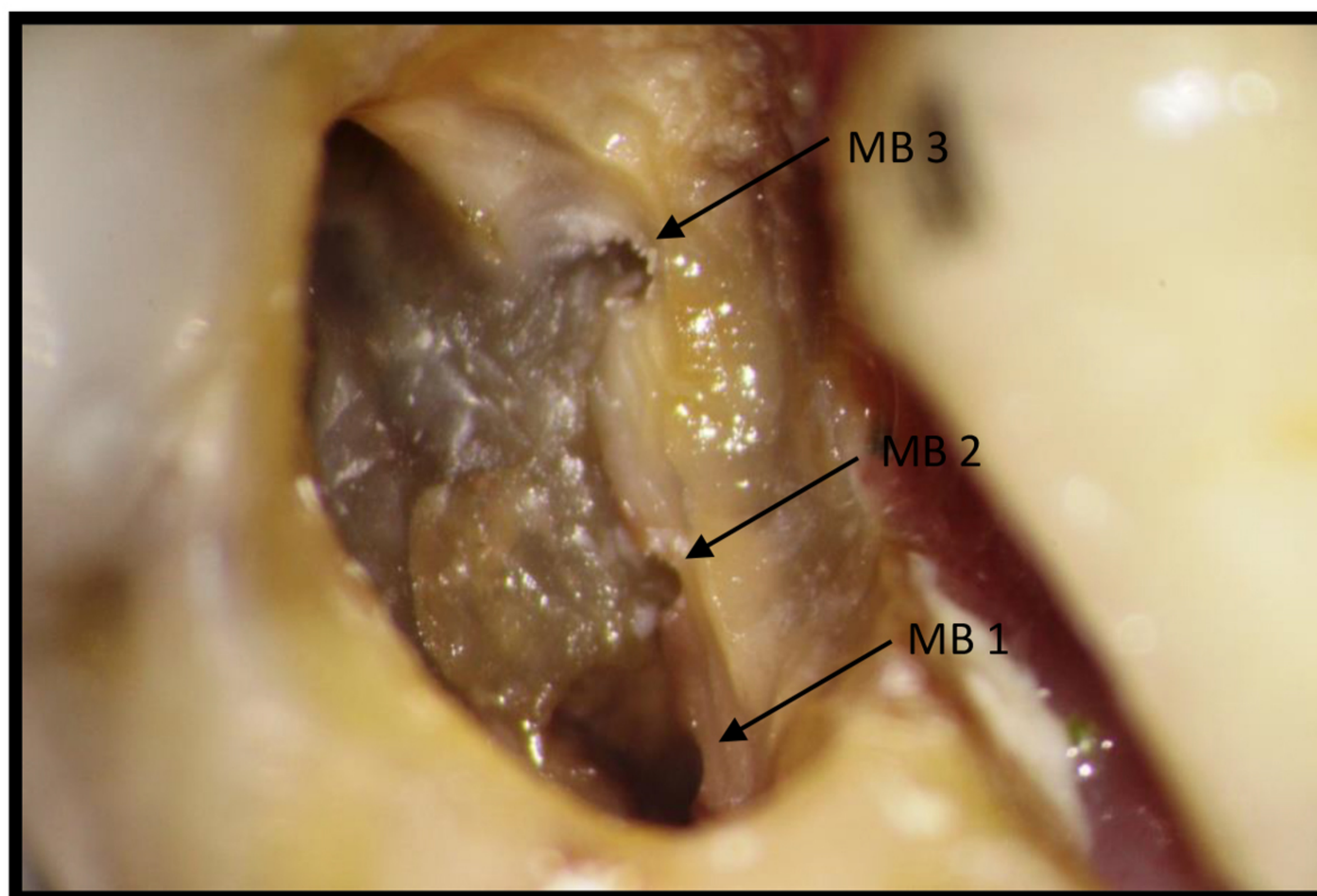


Fig: 2B. Identification of 2nd & 3rd Mesio-Buccal Canals

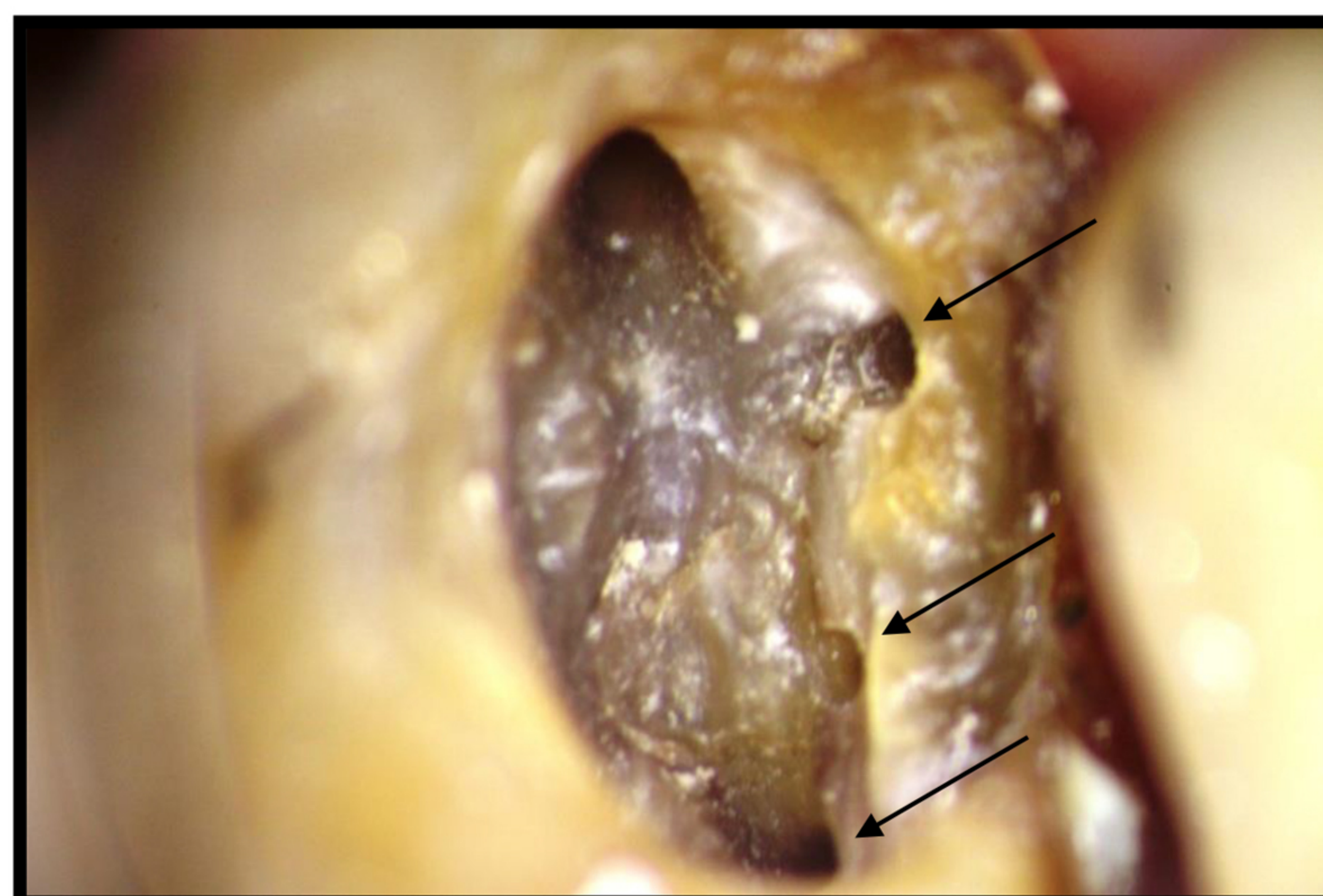


Fig:2C. After Complete Cleaning & Shaping of all the canals

DISCUSSION:

A clinician should attempt to locate and treat any root canal with good anatomical knowledge of the root canal system⁸. Conventional radiographs, surgical operative microscope and CBCT are some of the useful diagnostic tools which are useful during various stages of treatment^{9,10}. The major drawback of conventional radiograph is in the two dimensional nature and super imposition of images^{1,2,3,8,9}. In the present case there are four roots and four canals where the DB combined with two MB to form 3 buccal roots.

The ability of the operator to locate canals is influenced by patient co-operation, placement of files in areas that are difficult to access and the operators' knowledge about the dental anatomy of the tooth⁶. The prognosis of tooth with extra roots is dependent on the ability to identify the extra canals.

CONCLUSION:

When extra roots and canals are present, ability to identify and treat, helps to achieve predictable results. Modification of access cavity preparation is mandatory in identification and establishment of uninterrupted straight line access to the root canals. Radiographs at various stages is strongly recommended along with magnification, illumination to treat these root anomalies efficiently.

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