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RESEARCH ARTICLE

ENDODONTIC MANAGEMENT OF RADIX ENTOMOLARIS - A CASE REPORT

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Abstract

A successful endodontic treatment is the outcome of a comprehensive knowledge of the root canal anatomy. An understanding and awareness of the possibility and occurrence of unusual anatomy is vital to an effective treatment. Sometimes mandibular molars may have an additional root located lingually (radix entomolaris) or buccally (radix paramolaris). This case report is of successful endodontic management of a mandibular molar characterized as radix entomolaris.

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Introduction:-

The principal goal of endodontic treatment is the eradication of bacteria from the infected root canal and averting future reinfection. This is attained by a thorough cleaning and shaping of the root canal, followed by a three-dimensional filling with a fluid tight seal. A fundamental step of this procedure is the establishment of access for cleaning and shaping. In pursuit of these goals, the clinician must possess extensive knowledge of root canal anatomy and its variations such as extra roots, extra canals, webs, fins, and isthmuses that may perplex the procedure. The majority of first and second mandibular molars are two rooted with two mesial and one distal canal^[1]. A major variant in this group is the mandibular first molar which has three roots. This third lingual root, first mentioned in the literature by Carabelli, is called the radix entomolaris (RE)^[2]. RE has an occurrence of less than 5% in the Indian population, and such cases are rarely observed during routine endodontic procedures^[3]. Knowledge of such variations can be beneficial in delivering treatment to patients presenting with related diversities in their root canal anatomy.

A classification was given by Carlsen & Andersen^[4] based on the location of the cervical part They are types A, B, C, AC. Type A & B refers to a distally located cervical part, Type C refers to a mesially located cervical part and type AC refers to the location of the cervical part in the central location in between the mesial and distal components. De Moor et al^[5] had given another classification based on the curvatures in RE variants in the buccolingual direction. They are Type I refers to straight root / canals, Type II refers to a curvature at the entrance of the orifice and Type III refers to RE with two curvatures, one at the coronal level and the other at the middle third.

Case Report:

A 29-year-old female patient reported to the department of conservative dentistry and endodontics with the chief complaint of pain in lower right posterior region for 5 days. The pain was continuous in nature and aggravated on consuming hot food. On intraoral examination, a tooth-coloured restoration was seen in the lower right first molar tooth. The tooth was sensitive to hot as well as cold stimuli and was tender to percussion.

Patient gave history of dental visit two months back during which endodontic treatment was initiated. Radiographic examination revealed a large occlusal restoration close to the pulp of the tooth with an extra distal root. Ill defined periapical radiolucency was seen in mesial root (Fig 2).

The tooth 46 was anaesthetised with 2 % lignocaine with adrenaline 1: 80,000 dilution and inferior alveolar nerve block was given followed by rubber dam isolation. On accessing the pulp chamber, four canal orifices were located where the distal orifice was visualised situated eccentrically towards the buccal aspect of the tooth. A second orifice was located on the distolingual side (Fig 1). The coronal shaping of all of the orifices was done using Sx file ProTaper Gold (Dentsply, Switzerland). Primary binding file of #10 K file was inserted in all canals and working length was measured with electronic apex locator and confirmed with radiograph (Fig 3). Cleaning and shaping were done with rotary ProTaper Gold (Dentsply, Switzerland) file system up to size F1 in all the canals and master cone radiograph was taken size F1 (Fig 4). During instrumentation, 3% sodium hypochlorite was used as an irrigant which was activated with sonic irrigation system for 1 minute and 17% EDTA was used as final flush. Obturation was performed with gutta-percha points and AH Plus sealer (Dentsply, Maillefer, Ballaigues, Switzerland) using cold lateral condensation technique. Access cavity was restored using composite resin (tetric-N-ceram, Ivoclar, Vivadent) and a post-obturation radiograph was taken (Fig 5).

Discussion:-

Incidence of radix entomolaris varies from 5 to 30% and also among different populations^[6]. RE root is commonly found distolingually and ranges from being a short conical extension to a full-length root. The root may extend unilaterally or bilaterally and may contain pulpal tissue even if it is short and conical in form^[7]. The clinical examination of the tooth can reveal a more bulbous outline of the crown, an extra cusp (tuberculum paramolare), or a more prominent occlusodistal or distolingual lobe. These in combination with a cervical prominence or convexity can indicate the presence of an additional root^[8]. Radiographs taken at different angulations reveal the basic information regarding the anatomy of a tooth and can thus help to detect any aberrant anatomy such as extra canals/roots^[9]. While the exact cause of radix entomolaris is still not known, some authors say that it may be due to disturbance during odontogenesis or may be due to an atavistic gene^[6].

Radiographs taken at different angulations/ CBCT scan of the tooth should be examined to estimate the root length and curvature. Often, clinicians are prone to commit iatrogenic errors like straightening of a root canal resulting in loss of working length, ledge formation, zipping, transportation or even perforation. Hence, negotiation and cleaning of these curved canals must be carried out with diligence.

Based on literature, majority of radices entomolaris are curved. Occasionally, there is an additional curve starting from the middle of the root or in the apical third. Hence using pre-curved files, to establish a smooth glide path to the apical segment and Nickel-Titanium rotary files for cleaning and shaping, is the desired option^[10]. In this case, the distolingual root was conical in shape and had constricted canal due to which difficulty in instrumentation was encountered. This was managed by initial coronal preflaring using Protaper Gold rotary file Sx (Dentsply Maillefer, Ballaigues, Switzerland) and C+ hand files in sequential order. Irrigation activation was done using sonic irrigation system for better penetration of irrigant into canal irregularities. This was followed by obturation using resin-based sealer for hermetic seal and this case was successfully completed without any iatrogenic errors.

Conclusion:-

The numerous diversities in mandibular first molars make it crucial to anticipate and establish all canals during root canal treatment. Correct angulation and elucidation of radiographs help identify chamber and root anatomy. In an RE, the standard triangular opening cavity is modified to a trapezoidal form for better access and easy location at the disto-lingually located orifice of the auxiliary root. The presence of a supernumerary root can have clinical implications in endodontics. Hence, an accurate diagnosis prior to the commencement of treatment is of paramount importance.

Source of Funding

None.

Conflict of Interest

None.

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Annexures:**Fig 1:-** Access Opening.**Fig 2:-** Pre-operative radiograph.



Fig 3:- Working length radiograph.

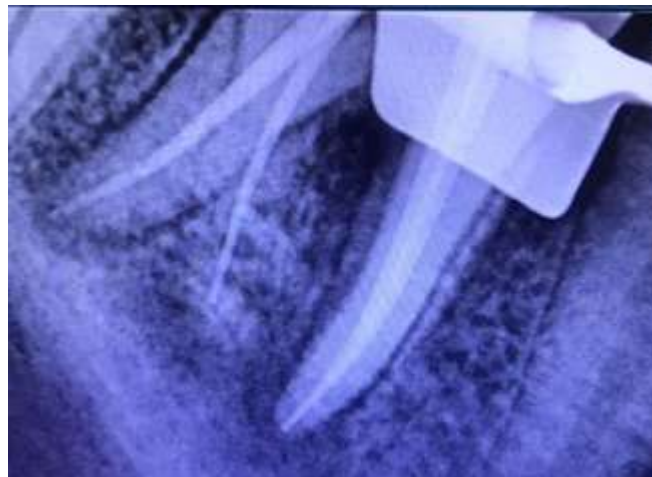


Fig 4:- Master-cone radiograph.



Fig 5:- Post-obturation radiograph.