

C Shape Canal Configuration: Complexities are Even More Beautiful

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Abstract: Unusual root canal anatomy always poses a diagnostic and treatment challenge for the dental clinician. This article presents a case of c shape root canal configuration of mandibular second molar managed successfully with endodontic treatment.

Keywords: C-shape canal, 3D FILL, endodontic success

1. Introduction

The c shape canal configuration is an anatomic variation commonly seen in mandibular second molar with prevalence ranging from 2.7% to 45.5% in different population.

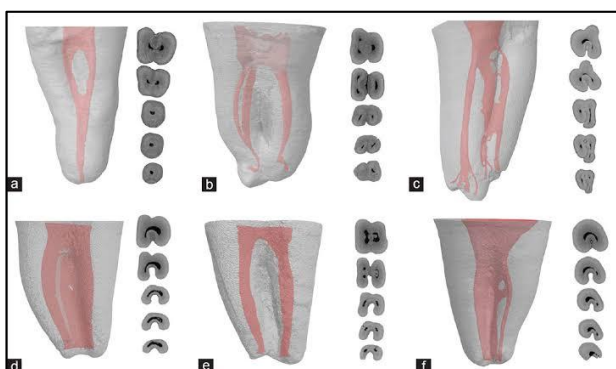
Documented by Cooke and Cox in 1979 in endodontic literature.

In this configuration, the root canals are connected by slit or web with varying anatomy along the root length which can be the endodontic challenge for a clinician during negotiation, debridement and obturation.

Knowledge of the c shape canal configuration is essential to achieve success in endodontic therapy. The occurrence of c shape canal and improper negotiation can lead to failure of endodontic case.

Effective management of this anomalous canal configuration can be achieved by following proper protocol for the treatment.

Case presentation with c shape canal system of mandibular second molar were treated successfully after taking ethical clearance and informed consent from patient.



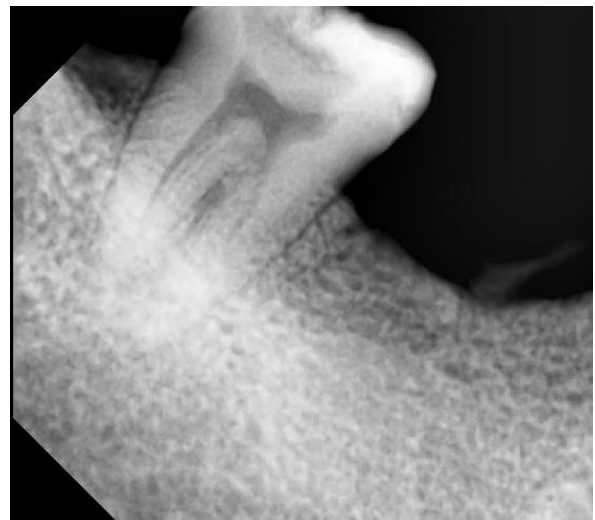
2. Case Report

A 35 year old female Patient reported with pain in the lower right back tooth region associated with 47 Medical history was unremarkable

Intraoral examination showed deep occlusal caries with 47 with tender on percussion

Preoperative radiographic diagnosis –

The preoperative radiograph provides various clues in the identification of any variation in root canal morphology. Radiograph showed deep dental caries involving pulp without periapical changes. There was radicular proximity of mesial and distal roots.



Pre-operative

- **Diagnosis** – the tooth was diagnosed with symptomatic irreversible pulpitis
- **Treatment plan** – endodontic treatment (rct)

Tooth was anesthetized and isolated

Access cavity preparation

Access cavity was prepared and visualize under surgical operating microscope

The floor of the pulp chamber shows three distinct orifice mesiobuccal mesiolingual and distal

The orifice were seen close together with a fin connecting the orifice

It was similar to c shape root canal configuration

Pulp chamber was irrigated with 5.25% sodium hypochlorite

Coronal flaring

Initial glide path upto 17mm prepared using 10k 15k 20k handfile k files (mani)

The coronal 1/3rd was prepared using gates glidden drill #1 peaso reamer #1
peaso reamer #2 used just at orifice

Working length determination –

Apex locator dual based dual frequency J morita root ZX MINI in true c shape canal, it is possible to pass an instrument from the mesial to distal aspect without obstruction for location and negotiation of canals3 initial files are inserted coronal third section reveled orifices close together connected by fin middle and apical third of the root reveled root canals joining to form single c shaped root canal apical gauging 15 iso; it helped to perform biomechanical preparation with shaper file

Biomechanical preparation

In order to access all irregularities in the c shape canal system crown down technique system – protaper gold rotary files S1 S2 F1canal should be always flooded with warm 5.25% sodium hypochlorite during BMP after instrumentation by rotary files, H file could be passively introduced into the canal and circumferential filling could be specifically directed to obtain better debridement caution must be taken to prevent perforation during cleaning and shaping

Irrigation –

Because of the large area of canal space, it is doubtful that intracanal intruments can reach and debride the entire system making irrigation procedure more significant.

It enhance necrotic tissue removal

It is recommended that cleaning of the c shape canal system with rotary should be assisted by ultrasonic irrigation

Irrigation protocol

1 min warm 5.25% sodium hypochlorite activation with ultrasonic endoactivator

1 min 17% liquid EDTA (dentwash)

Again 1 min warm 5.25% sodium hypochlorite activation

Use normal saline to remove all the traces of sodium hypochlorite

Obturation

The aim should be to obtain the 3-dimensional 3D FILL obturation of the c shape canal system

Dry the canals with sterilized paper points

If canal is wet intracanal medicament RC-CAL calcium hydroxide (ultradent ultracal) given for 7-14 days notices dry canal then only proceed for obturation

Ensure the proper placement of the mastercone; standardized gutta percha

Mastercone had strong seal while retrieval ‘apical tug back ‘

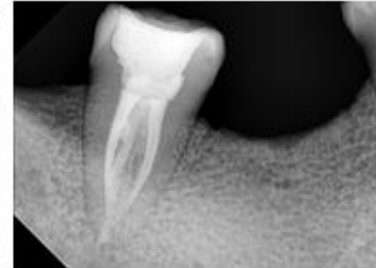
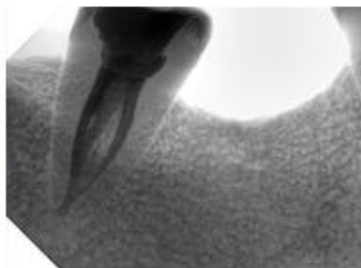
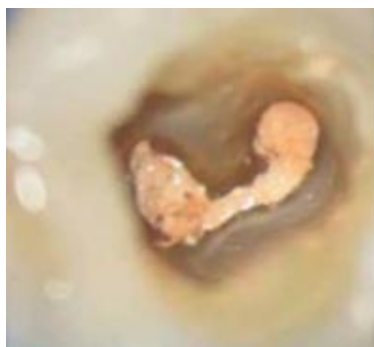
Freshly mixed sealer was used (calcim hydroxide based sealer – sealapex)

Mastercone placed with gentle pumping action

Lateral condensation technique used 5% spreader 4% accessory cones

The condensation offers the pressure on the filling material and enhances the sealing ability

Seal off GP at canal orifice with the warm vertical compaction technique



3. Post Endodontic Restoration

Chamber retained bonded amalgam or composite is the better choice as core or as final restoration of the teeth

4. Conclusion

The C shape canal configuration has high prevalence rate in mandibular second molars. To manage these cases effectively, proper understanding of the anatomical presentation of the variation, adequate cleaning and shaping

along with irrigation and 3D fill is the key for the endodontic success of the C shape canal configuration.

Author Profile

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