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ENDODONTIC MANAGEMENT OF C SHAPED CANAL USING HYFLEX EDM: 2 CASE REPORTS

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Abstract:

C shaped canals are a morphological variation that is most commonly seen in mandibular second molars. C shaped canals present a single ribbon shaped pulp chamber. They were first described by Cooke and Cox. These canals are often missed and present a challenge to the clinician. The interconnecting isthmuses of the various canal orifices form a C shape. This article presents a case series of the root canal treatment of C shaped canals.

Keywords: C Shaped canal, Hyflex EDM

1. INTRODUCTION

C shaped canals are a morphological variation that are seen as ribbon shaped pulp chamber. It may be a single continuous C shape canal from chamber to apex or it may have a semi colon shape with one C shape canal and another distinct canal. These are formed due to communications between the canals that make the internal anatomy complex. These present a challenge to the clinician due to their complex anatomy. Often C shape canals are missed or are difficult to clean and shape.

The occurrence of C shaped canals have been attributed to various reasons. Many theories have been conjectured. The most accepted reason seems to be the failure of Hertwig's epithelial root sheath. Failure of fusion of Hertwig's epithelial root sheath results in formation of groove on the opposite side. However, their remains an interconnecting ribbon between the canals forming a C shaped canal.

C shaped canals have been classified by various authors viz. Melton, Fan and others. This has been done to enable a better understanding of the various canal morphological variations.

This article highlights two such cases of the C shaped canal morphology.

2. CASE REPORT 1

A 25 year old female patient reported to the Department of Conservative Dentistry with the chief complaint of pain in lower right back tooth region. The patient had a faulty restoration in relation to lower right second molar. The pain was continuous and was aggravated on mastication and intake of hot and cold beverages. The patient also gave a history of night pain. After radiographic examination and vitality testing, it was diagnosed to be a case of Irreversible pulpitis. Root canal treatment was advised.

After administration of local anesthesia, the tooth was isolated under rubber dam and access cavity was prepared. The single orifice was found which further enlarged to from a C shaped canal. The working length was determined using electronic apex locator. The canals were negotiated and glide path was prepared. Canals were copiously irrigated with 2.5% sodium hypochlorite during instrumentation. The canals were prepared upto 25/0.06 taper using Hyflex EDM. The canals were obturated using thermoplasticized obturation and post endo restoration was done with composite as depicted in figure 1(b).

Figure 1(a): Preoperative radiograph

Figure 1(b): Post operative radiograph

3. CASE REPORT 2

A 30 year old patient reported to the Department of Conservative Dentistry and Endodontics with the chief complaint of pain in lower left back tooth region. The tooth was non vital on vitality testing. The radiograph showed caries extending upto the pulp chamber. It was diagnosed to be a case of irreversible pulpitis. Root canal treatment was advised and explained to the patient.

Local anesthesia was administered to the patient and access cavity was prepared. The radiograph showed two canals with a radiolucent line in the centre suggestive of a C shape canal (Figure 2(a)). One orifice in the shape of a C was identified. The working length was determined using an electronic apex locator. The canals were cleaned and shaped with Hyflex EDM. Irrigation was performed with Endoactivator for mechanical agitation of sodium hypochlorite for proper cleaning during each instrument change. Obturation was done using thermoplasticized technique (Figure 2(b)). The post endodontic restoration was done with composite.

Figure 2 (a): Preoperative radiograph

Figure 2(b): Obturation

4. DISCUSSION

C shape canals have always been an enigma for the dental surgeon. They are difficult to identify and treat.

The C-shaped canal configuration presents with variations in both the number and location of the canal(s), as the canal(s) courses from the coronal to the apical third. The complexity of this canal configuration proves to be a challenge with respect to debridement and obturation and possibly the prognosis during root canal therapy. Recognition of a C-shaped canal configuration before treatment can facilitate effective management, which will prevent irreparable damage that may put the tooth in severe jeopardy.[1]

The pulp chamber in teeth with C-shaped canals may be large in the occlusoapical dimension with a low bifurcation. Alternatively, the canal can be calcified, disguising its C-shape. At the outset, several orifices

may be probed that link up on further instrumentation.[2]

Sometimes, it is difficult to identify the orifices as deep penetration may be needed. During cleaning and shaping, normal preparation can be done in mesial and distal canals. Nevertheless the isthmus should not be prepared with larger than number 25 files; otherwise, strip perforation is likely. The anti-curvature filing method will be useful in this circumstances.[3]

Because of the large volumetric capacity of the C-shaped canal system, housing transverse anastomoses and irregularities and continuous circumferential fling along the periphery of the C canal is irrigated with copious amounts of 5.25% NaOCl are often necessary to ensure maximum tissue removal and cessation of bleeding.[2]

The obturation of C shaped canals has to be done keeping in mind that all the anastomoses should be properly obturated. Thermoplasticised gutta percha technique and warm vertical condensation are the recommended techniques for C-shaped root canals. [4]

C-shaped canals in mandibular second molars can vary in number and shape along the length of the root with the result that debridement, obturation, and restoration in this group may be unusually difficult.[5]

Hyflex EDM was chosen for this study as it shows higher cutting efficiency. The EDM technology increases its fracture resistance and shows better results.

5. CONCLUSION

C shape canals are interesting morphological variations that are mostly seen in mandibular second molar. This article presents two such case reports highlights and the importance of proper identification, cleaning and shaping of such canals. Further studies are needed to seek adjunctive aids that can make root canal treatment of such canal complexities more efficient.

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