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Case Report

Management of C-Shaped Root Canals Configuration-A Report of Five Cases

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Abstract: A thorough knowledge of the root canal configuration including the morphology of teeth involved in root canal treatment is fundamental for effective endodontic treatment. This case report discusses successful management of five cases of c-shaped canal configuration.

Keywords: Mandibular second molar, C- Shaped canals, Management

INTRODUCTION:

A thorough knowledge of the root canal configuration including the morphology of teeth associated with root canal treatment is fundamental for effective endodontic treatment [1]. The C-shaped canal anatomy was first reported by Cooke and Cox (1979) in mandibular second molar. It is named accordingly owing to the C-shaped cross-sectional anatomical configuration of the root and root canal [2].

The primary etiology of the C - shaped canal is a failure of Hertwig's epithelial root sheath to fuse on buccal or lingual root surface [3]. The incidence of C-shaped root canal configuration reported among (2.7% to 44.5%) in mandibular second molars followed by maxillary molars (0.92%) and maxillary second molar (4.9%) [4]. This case report discusses successful management of five cases of c-shaped canal configuration.

CASE 1

A 45 year old female patient presented at the Department of Conservative Dentistry & Endodontics with the complaint of pain in relation to 47. On clinical examination the tooth revealed deep caries in relation to 47. There was no other significant medical history. The canal morphology confirmed the presence of a single root with multiple canal (figure 1). Access was prepared after adequate anesthesia with rubber dam. A two orifice was located in the middle of the floor of the pulp chamber (figure 2). Working length was determined (figure 3) & canal was prepared by crown down technique. Copious irrigation was carried out with 5.25% Sodium hypochlorite and normal saline. The canals were thoroughly dried and obturation was done using number 25 Gutta-percha and AH Plus sealer (Dentsply, Maillefer) (Figure 4 and 5).

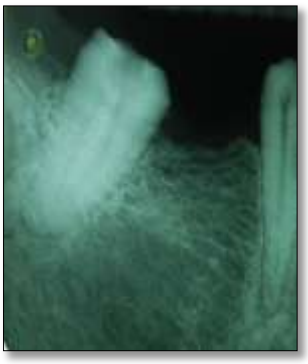

Fig-1: Preoperative

Fig-2: Intra oral image

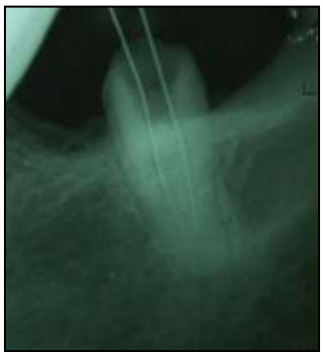

Fig-3: Working Length

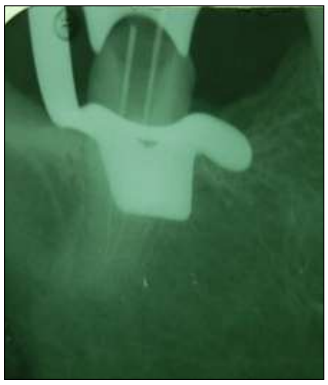

Fig-4: Master Cone

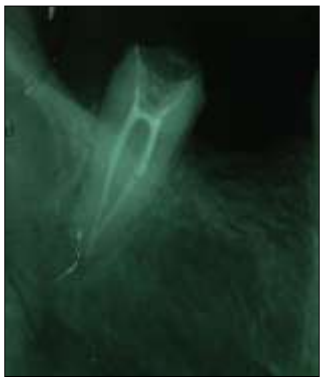

Fig- 5: Postoperative

CASE 2

A 25 year old female patient presented to the Department of Conservative Dentistry and Endodontics with the chief complaint of pain in relation to 47. There was no other significant medical history. Intra oral examination revealed carious 47 with pain on percussion. The radiograph showed pulpal involvement with fused mesial and distal roots (figure 1). Tooth diagnosed with acute apical periodontitis. Access was prepared after adequate anesthesia with rubber dam and one mesial orifice & A broad C- shaped distal orifice (Figure 2).The working length determined.(figure 3).The cleaning and shaping was performed with Hero Shaper rotary files (Micro Mega, Besancon, France). Copious irrigation was carried out with 5.25% Sodium hypochlorite and normal saline. The obscuration was done using 4% cone and AH plus sealer (Dentsply, Maillefer) (Figure 4 and 5).

Fig-1: Preoperative

Fig- 2: Intra oral image

Fig- 3: Working length

Fig-4: Master Cone

Fig-5: Post-Operative

CASE 3

A female patient aged 28 years presented to the Department of Conservative Dentistry & Endodontics with the chief complaint of pain in the lower left back tooth region. On Clinical examination revealed extensive caries. On radiographic examination revealed fused roots (figure1). On Intra oral examination revealed carious tooth 37 with pulp involvement. Access cavity was prepared after LA given. After pulp extirpation, the pulpal floor demonstrated two orifice one mesial and one distal was located in the center of the pulp chamber ([figure 2). The working length determined (figure 3).Cleaning and shaping was done using Revo-s rotary files (Micro Mega, Besançon). Copious irrigation was carried out with 5.25% Sodium hypochlorite and normal saline. The obturation was done using master cone with AH-Plus sealer (Dentsply, Maillefer) (Figure 4and5).

Fig-1: Preoperative

Fig-2: Intra oral image

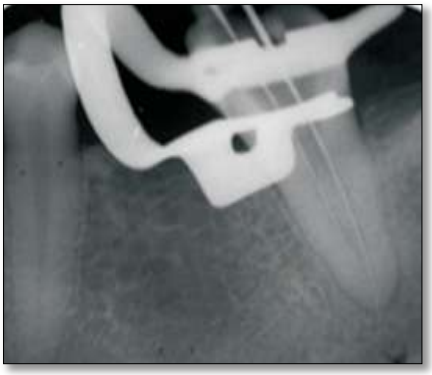

Fig- 3: Working Length

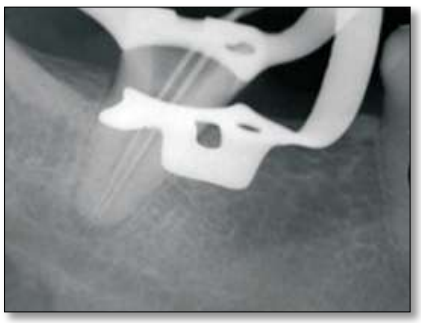

Fig- 4: M aster Cone

Fig- 5: Post-Operative

CASE 4

A 36 year old female patient reported to the Department of Conservative Dentistry & Endodontics with a complaint of pain of her lower left back tooth region. The medical history was noncontributory. Intra oral examination revealed mesio proximal caries on tooth 37 with necrotic pulp and slight pain on percussion.(Figure1) The access cavity was prepared under local anesthesia. The pulpal floor demonstrated mesial or distal orifice and a broad C-shaped middle orifice look like semicolon sort morphology (Figure 2). Working length was determined (Figure 3).Cleaning and shaping of the canal was done with hand K_3 rotary files (Sybronendo)The ant curvature filing method was performed to avoid the strip perforation. Copious amount of 5.25% sodium hypochlorite was used for irrigation. The obscuration was done using master cone

with AH-Plus sealer (Dentsply Maillefer) (Figure 4 and 5).

Fig-1: Preoperative

Fig-2: Intra oral image

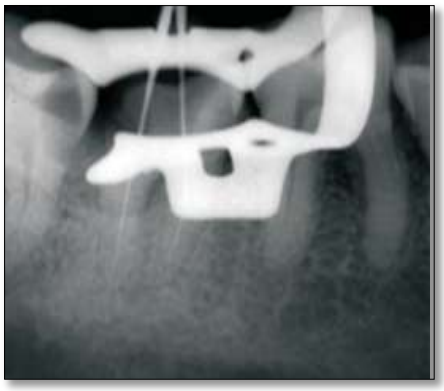

Fig- 3: Working Length

Fig- 4: Master Cone

Fig-5:Post-Operative

CASE 5

A 33 year old female patient presented to the Department of Conservative Dentistry and Endodontics with a complaint of pain in the lower right back tooth region. Her Medical history was noncontributory. Radiographically disto proximal radiolucency was seen involving pulp .The radiograph also showed a single conical root. (Figure 1). Access was prepared after adequate anesthesia with rubber dam and one single orifice was located in the center of the pulp chamber [Figure 2]. The pulp chamber was irrigated with 5.25% sodium hypochlorite. Working length was determined [Figure 3].Cleaning and shaping was done with Prosper rotary files (Dentsply, Maillefer) the obscuration was done using F3 cone with AH-Plus endodontic sealer (Dentsply Maillefer) (Figure 4 and 5).

Fig-1: Preoperative

Fig- 2: Intra Oral Image

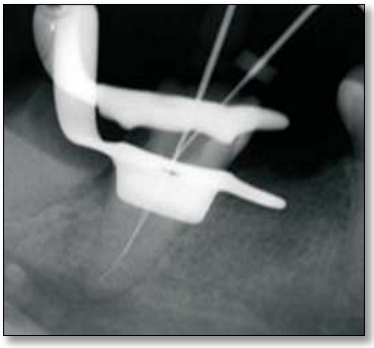

Fig-3: Working Length

Fig-4: Master Cone

Fig-5: Post-Operative

DISCUSSION

The awareness of internal dental anatomy and variations of the root canal system of multicoated teeth represents a challenge to diagnosis and treatment. The preoperative knowledge of possible anatomic variations is important for the achievements of the endodontic treatment [5].

Numerous classifications of C-shaped canals configuration have been proposed to make the diagnosis and treatment. Melton et al in 1991 divided the C-shaped canals into three types. Type I - continuous C-shaped canal. Type II - Semicolon, in which a C-shaped canal is presented buccal or lingual, separated from another distinctive canal with a dentine wall. Type III - Separate canals are present [6].

Fan *et al.* revised Melton's classification and divided the C-shaped canals into three types:

Type I- The shape is a continuous. Type II-The canal shape resembles a semicolon resulting from a break in the C outline. Type III- Two or three separate canals. Type IV- One round or oval canal in the cross - section. Type V- No canal lumen can be found. [7] The presented case report 5 can be assigned to type 1melton classification. The Second case report can be assigned to type 2 of Melton's classification.

Management of the C-shaped canals intend be combined with additional measures for complete debridement and thorough cleaning of the intricate root canal anatomy [8]. Gain access to cavity design modify cation may be essential to find and negotiate the complete root canal system. Calcifications in the pulp chamber should be negotiated with ultrasonic tips to reveal the canal anatomy completely [9].

Cir-conferential filing must be carried out to make certain maximum tissue elimination and attention need to be taken to avoid strip perforation [10].Consequently, the anti-curvature filing became achieved in all the cases Copious irrigation with 5. 25 % (Nicoll) sodium hypochlorite should be done to debride the intricacies of the C-shaped canal. Irritant should be activated by means of ultrasonic [11]. Complete Obscuration of the C-shaped canal complete Obturation of the C- formed canal is tough to achieve. Lateral compaction with sealer and heated spreaders or use of thermos plasticized gutter percha is indicated [12]. This studies five cases of C- shaped canal configuration which were diagnosed and managed successfully.

CONCLUSION

The successful endodontic management requires thorough knowledge about atypical root canal systems. The significant care should be taken during biomechanical preparation and obscuration of C-shaped root canals for achieving success in root canal therapy, alongside with good prognosis.

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