Retrieval of Separated Instruments from Apical Third of Root Canal of Maxillary Central Incisor Using Masserann Technique – A Case Report

Dixit S[1], Arora S[2], Nayar P[3], Arora L[4], Sharma S[4]

Abstract:

One of the most frequent endodontic mishaps is the separation of the endodontic instrument in the root canal. It often results from incorrect use or overuse. A fractured instrument inside a root canal can affect the outcome of an endodontic treatment as it interferes with the proper debridement and shaping procedures as well as with irrigation of the canal portion apical to the level of obstruction. One of the orthograde approaches recommended to manage a separated instrument is its removal from the root canal. Masserann Kit is one such device for orthograde removal of intracanal metallic obstructions. A Masserann kit is a hollow tube device specially designed for the removal of intracanal metallic objects from the root canal. This article presents a case report of successful retrieval of separated instrument from the apical 3rd of root canal of right maxillary central incisor using Masserann kit.

Keywords : Masserann Technique, Separated Instrument, Endontic Mishap.

Introduction

Fracture of endodontic instruments in a root canal is an unfortunate occurrence that may hinder the root canal procedure & negatively impact the endodontic treatment outcome[1]. Fracture instrument itself may not cause treatment failure. However, fragments present in the root canal can hinder proper preparation of root canal space[2]. The overall endodontic prognosis following instrument separation is likely to depend on the stage and degree of canal preparation and disinfection at the time of instrument fracture, the main prognostic factor in such cases is reported to be the existence or nonexistence of a preoperative periradicular pathosis.[1] Masserann kit is one of many devices that have been proposed for fractured fragment removal.[3]

A Masserann kit is a hollow tube device specially designed for the removal of intracanal metallic obstruction with a reported success rate of 55%. It consists of a series of trepan burs that are used to prepare a space around the most coronal part of an obstructing object and two sizes (1.2 and 1.5 mm in outer diameter) of tubular extractors, which are inserted into the created space and mechanically grip the object. It consists of a series of trepan burs that are used to prepare a space around the most coronal part of an obstructing object and two sizes (1.2 and 1.5 mm in outer diameter) of tubular extractors, which are inserted into the created space and

Corresponding Author : Dr. Laxmi Arora, PG Student, Department of Conservative Dentistry & Endodontics, Seema Dental College & Hospital, Rishikesh. **(M)** +91-8958383801 **E-mail:** lakshmiarora058@gmail.com

1. Professor and Head, Department of Conservative Dentistry & Endodontics, Seema Dental College & Hospital, Rishikesh.
2. Reader, Department of Conservative Dentistry & Endodontics, Seema Dental College & Hospital, Rishikesh.
3. Senior Lecturer, Department of Conservative Dentistry & Endodontics, Seema Dental College & Hospital, Rishikesh.
4. Department of Conservative Dentistry & Endodontics, Seema Dental College & Hospital, Rishikesh.

mechanically grip the object.

This case report is about the successful retrieval of a separated file wedged in the apical 3rd root canal dentin of a maxillary right central incisor using Masserann technique.

Case Report

A 35-year-old male patient was referred to the Department of Conservative Dentistry and Endodontics with the complaint of pain in right upper front tooth region for past two months and also he gave the history of root canal treatment done of the same tooth. The patient had no significant medical history. Clinical examination revealed that the tooth was slightly sensitive to percussion. The periodontal probing was within normal limits.

A diagnostic radiograph was made, which revealed the presence of a separated instrument in apical third of canal (Fig.1).

Fig. 1 : Preoperative IOPA X-Ray

First, the length of the working space to the coronal end of the fragment was determined Radicular access to the coronal end of the fragment was straightened by funnelling the root canal with sequential use of Gates –Glidden drills.

The pre-selected trephan with a diameter of 1.2mm was latched into contra angle hand piece and run in an anticlockwise direction to create a trough around the coronal end of the fragment by ditching the dentin. The centering of the trephan over the fragment was ensured radiographically.

During troughing, canal was simultaneously irrigated with normal saline. This decreased the heat generated within the root canal and therefore lowered the damaging effects on periodontal tissues.

The extractor tube with a diameter of 1.2mm was slid into the trough to sleeve the fragment and the plunger rod was turned manually, inside the extractor tube in a clockwise direction to grip the fragment against its wall. It took many pains taking attempts of sleeving and gripping the fragment and in one such attempt, when the tightest grip was felt by the tactile sense, the entire assembly was rotated in an anticlockwise direction to unscrew the fragment from the dentin and withdrawn to see the fragment retrieved (Fig. 2). Canal free of the fragment was evident radiographically (Fig. 3).

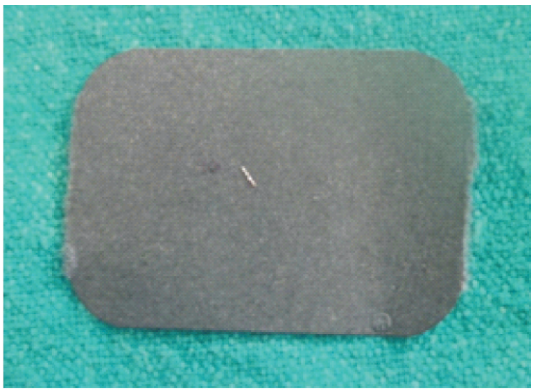

Fig. 2 : File retrieved

Fig. 3 : IOPA showing file retrieved

The time taken to retrieve the fragment was approximately 1½ hour. In the subsequent visits, canal cleaning and shaping was completed and obturation was carried out.(Fig. 4).

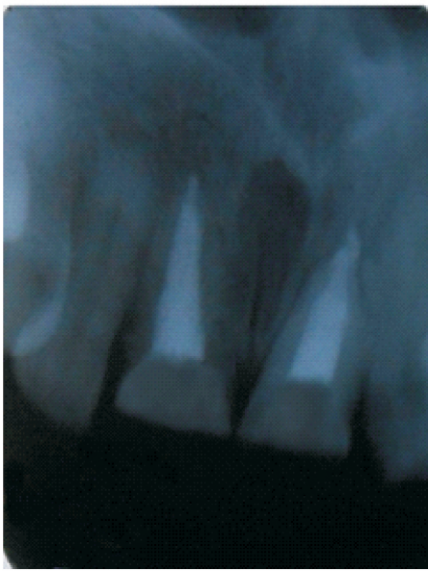

Fig. 4 : Obturation after file retrieval

The access opening was restored permanently with composite restoration followed by crown preparation and cementation of porcelain fused to metal crown. (Fig. 5)

Fig. 5 : Porcelain fused to metal crown cemented

In the follow up visit, the tooth was found asymptomatic without any radiographic changes.

Discussion

Separated instruments in the canal usually prevents access to the apex, impedes thorough cleaning and shaping of the root canal, thus may compromise the outcome of retreatment[3-5]. In such a case, it is said that the prognosis depends on the condition of the root canal, canal anatomy, periapical status, amount of cleaning and shaping at the time of separation, the level of separation in the canal and type of fractured instrument[6].

Recommended management of a fractured instrument involves an orthograde or a surgical approach. Orthograde approach consists of bypassing the instrument and removing the instrument. Retrieval may lead to successful non-surgical treatment or retreatment, which is the more conservative approach[4]. The orthograde retrieval depends on cross sectional diameter, length, curvature, dentin thickness and morphology of the root, length, location and amount of binding or impaction of the fragment in the canal.

Masserann Kit has been used for over 30 years as a device for removing broken instruments and a success rate of 73% had been reported

regarding its use in anterior teeth. However, it has limited application in posterior teeth, teeth with thin roots, curved roots or more apically, as the use of relatively large and rigid trephans lead to removal of considerable amount of root dentin and weakening of the teeth or risk of perforation.

In this case, the separated file was tightly bound in the straight, apical 3rd of the maxillary central incisor. Masserann technique was employed. Obtaining of straight line access to the fragment facilitated centering of the trephan over the fragment. This ensured circumferential freeing of the coronal end of the fragment with safe cutting of the peripheral dentin around the fragment. This promoted tight gripping of the fragment and its retrieval along the long axis of the root, thus allowing regular retreatment[5].

Conclusion

Prevention of the instrument separation is the best strategy. In case of separation, safe retrieval or bypassing should be carried out. Among the retrieval methods, Masserann technique is risky and time consuming, yet by tactful applicability and within its clinical limitations, a separated file was retrieved from maxillary central incisor.

References

1. Jain Prateek, Bhat Ganesh T., Shetty Aditya, Hegde Mithra N.. Management option of intracanal separated instruments: A Review: Journal of pharmaceutical and scientific innovations 2013; Vol. 2(6): 17-21.
2. Cheung GSP. Instrument fracture: mechanisms, removal of fragments, and clinical outcomes. Endod topics 2009;16:1-26.
3. Pai ARV, Kamath MP, Basnet P. Retrieval of separated file using masseran technique: A Case report. Kathmandu University Medical Journal 2006, Vol. 4(14) 238-42.
4. Arcangelo CM, Varvara G, Fazio P.D. Broken instrument removal – two cases, J Endodon 2000 ; 26 : 568 – 70.
5. Hulsmann M. Methods for removing metal obstruction from the root canal. Endod Dent Traumatol 1993 ; 9: 223-37.
6. Alomairy KH. Evaluating two techniques on removal of fractured rotary nickel-titanium endodontic instruments from root canals: An in vitro study. J Endod 2009;35:559-62.

Source of Support: NIL
Conflict of Interest: None Declared