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Case Note

Retrieval of a separated file using Masserann technique: A case report

Pai ARV[1], Kamath MP[2], Basnet P[3]
[1]Associate Professor [2]Professor and Head of the Department [3]Specialist Resident, Department of Conservative Dentistry & Endodontics MCODS, Mangalore, India

Abstract
The separated instrument particularly a broken file leads to metallic obstruction, in the root canal and blocks thorough cleaning and shaping procedure. When attempts of bypassing such a fragment go in vain, it should be retrieved by mechanical devices. Masserann Kit is one such device for orthograde removal of intracanal metallic obstructions. This clinical case demonstrates usage of Masserann technique in successful retrieval of a separated file which was tightly binding in the apical 3rd root canal dentin of maxillary left lateral incisor.

The separation of instruments during endodontic therapy is a troublesome incident and ranges from 2-6% of the cases investigated.[1] The separated fragment blocks the access to thorough root canal cleaning and shaping procedure apical to the level of separation or irritates the periapex when it juts out of the root apex. This is significant in a tooth which is non vital and associated with periapical pathosis as it affects the final outcome of the endodontic therapy. Hence an attempt to bypass or retrieve the instrument should be made before leaving and obturating to the level of separation or embarking upon surgery. Orthograde retrieval is often difficult, time consuming and the success rate ranges from 55 – 79%.[1]

Masserann technique is one among many methods of instrument retrieval. This technique is useful in retrieving broken files, silver points and posts from the root canal and in general a success rate of 55% has been reported.[2, 3]

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

Case Report
A 35 year old female was referred to the Department of Conservative Dentistry and Endodontics, Manipal College of Dental Science, Mangalore, with an endodontic mishap, in the form of instrument separation.

Radiographic examination revealed, under obturated root canal filling in maxillary left lateral incisor and canine, with a fragment of separated file in the apical 3rd of the former (Fig 1), Hence the patient was referred for retreatment in both the teeth.

Since the efforts of bypassing the fragment went futile, Masserann technique was employed for its retrieval.

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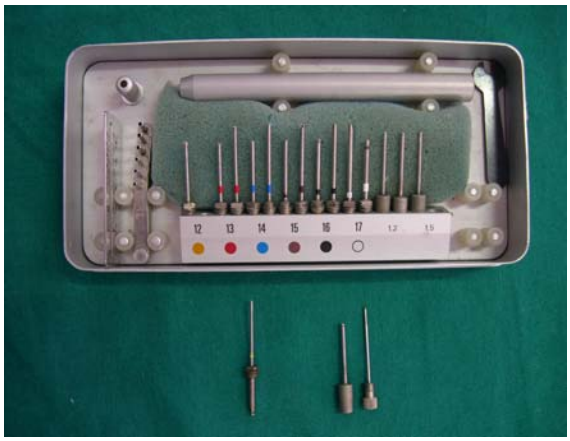
Dr. A.R. Vivekananda Pai
Associate Professor
Department of Conservative Dentistry and Endodontics
MCODS, Mangalore, India

Fig 1: Underobturation in Maxillary lateral incisor and canine with a separated file in the former

Fig. 2: Masserann Kit consisting of assortment of trephans and extractors with plunger



Clinical Technique

The armamentarium used consisted of long, crown cutting diamonds (Shofu Preparation Kit, Japan), Gates- Glidden drills (Mani Inc., Japan), slow speed, contra angle handpiece (NSK, Japan), and Masserann kit (Micro Mega, France) which contains an assortment of colour coded, end cutting trephan burs of increasing size which are rotated anti clockwise to create space around the coronal end of the fragment by cutting surrounding root canal dentin and two sizes (1.2 and 1.5mm in outer diameter) extractors to be inserted into the created space. The extractor is tube like with a plunger rod (stylet) which when screwed inside the extractor locks the exposed coronal end of the fragment against internal embossment just short of the end of the extractor.

First visit

The underobturated Gutta –percha filling of the root canals of both the teeth were removed. In lateral incisor, the length of the working space to the coronal end of the fragment was determined and its access opening was refined using long, crown cutting diamonds to obtain a straight line coronal access.

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 (Fig3)

The extractor tube with a diameter of 1.2mm was slid into the trough to sleeve the fragment and following radiographic confirmation of this (Fig 4), the plunger rod was turned manually, inside the extractor tube in a clockwise direction to grip the fragment against its wall.

It took many painstaking 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 5).Canal free of the fragment was evident radiographically (Fig 6).The time taken to retrieve the fragment was approximately 60 minutes

Fig.3: Trephan centered over the fragment

Fig. 4: Extractor with plunger sleeving and gripping the fragment

Fig. 5: Fragment retrieved by the Extractor

Second Visit

Retreatment employing regular root canal cleaning and shaping followed by obturation using lateral condensation technique was carried out in both the teeth but separately (Fig 7) and were kept under observation.

Recall Visits

After post obturation observation period, the access openings were restored followed by full coverage of the re-treated teeth using porcelain fused to metal crowns. On $1^{1}/_{2}$ year follow up both the teeth are asymptomatic, without any radiographic changes. (Fig 8)

Fig. 6: Root canal free from the fragment

Fig. 7: Reobturated lateral Incisor and canine

Fig. 8: $1^{1}/_{2}$ year Follow up

Discussion

Intra canal separation of instruments usually prevents access to the apex, impedes thorough cleaning and shaping of the root canal, thus may compromise the outcome of endodontic treatment and reduce the chances of successful retreatmet.[1,2,4]

In such cases, prognosis following an endodontic therapy depends on the condition of the root canal (vital or non vital) tooth (symptomatic or asymptomatic, with or without periapical pathology), amount of cleaning and shaping at the time of separation, the level of separation in the canal and is generally lower than the one with normal endodontic treatment.[1, 5]

Hence every attempt should be made to bypass or retrieve the separated instrument. The orthograde retrieval depends on cross sectional diameter, length, curvature, dentin thickness and morphology of the root, composition, cutting action (clockwise or counter clockwise) of the instrument, length, location and amount of binding or impaction of the fragment in the canal.[2,6] Masserann Kit has been used for over 30 years as a device for removing broken instruments and a success rate of 73% and 44% had been reported regarding its use in anterior and posterior teeth respectively. However it needs a well controlled use with ample convenience form and frequent radiographic monitoring.[3, 4] 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. It is often time consuming, requires 20 minutes to several hours and is consisted to be inferior to ultrasonics.[3, 7]

However, Masserann Kit is useful in removing metal obstructions from anterior teeth having thick, straight roots. More over, the locking mechanism of the extractor provides considerable retention in gripping and dislodging an obstruction, which is tightly wedged in the canal. Nevertheless, the scope for its modification, usage along with ultrasonics and surgical operating microscope makes it more effective in selected cases.[3,4]

In this case, the separated file was tightly bound in the straight, apical 3rd of the maxillary lateral incisor. Since the attempts of by passing it failed, 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.

Conclusion

Prevention of the instrument separation is the best strategy to avoid any stress and anxiety associated with it. In case of separation, safe retrieval or by passing should be carried out. Among the retrieval methods, Masserann technique is risky and time consuming, yet by tactful applicability, within its clinical limitations, a separated file was retrieved from maxillary lateral incisor. 1½ year post obturation follow up in this case has shown that Masserann technique was useful in promoting successful endodontic retreatment.

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