

Management of Silver Point Retrieval for Root canal Retreatment: A Case Report

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ABSTRACT

*The historical importance of the solid core material is decreasing. When greater, more precise preparation of the canal space was not possible due to inferior metallurgy and instrument design, it was frequently utilized in the past. Silver points were machined with a circular cross section and more frequently than not went into oval than round canals. Long-term success rates might not be as great, but some cases may defy the odds. The prognosis after treatment and follow up by phone five years after the completion of treatment. A 46-years-old Chinese female was referred from a general private practitioner for the endodontic management of 36. The tooth had been endodontically treated 30 years before; subsequently the patient complained of occasionally mild discomfort that last a few second without any stimulating factors at the lower left molar. Radiographic finding revealed that the tooth had been treated with silver points and associated with periapical radiolucency. Non-surgical root canal retreatment was performed for the tooth. **Conclusions:** Due to the nature of partially removal silver points, even though the prognosis is guarded at the time of obturation. After five years, it was considered favourable although it was extracted due to fracture.*

Keywords: *silver point, root canal retreatment, fracture, root canal treatment, case report.*

INTRODUCTION

Silver points has been obsoleting in the endodontic fields. The fact it was no longer used as obturation materials. However, once in a blue moon, dentist and endodontists may encounter this type of case during their daily practice. The 1930s saw the introduction of silver points for endodontic obturation. Silver points of the same diameter as files and reamers were first introduced by Jasper in 1933(Rotstein & Ingle, 2019). Due to its ductility, radiopacity, and some antibacterial properties, silver points have historically been used extensively. Silver points do not provide an adequate three-dimensional root canal seal; instead, they merely create a plug in the apical constriction, with inadequate adaptation to the root canal walls and no ability to close the auxiliary

canals that are frequently present. Silver points also erode with time, which once more jeopardizes the apical seal (Berman & Hargreaves, 2020).

It is crucial to distinguish gutta percha from silver point obturation in failing root canal cases radiographically because silver point appears more radiopaque and parallel along its length than gutta percha does (Rotstein & Ingle, 2019). When endodontic nonsurgical retreatment is chosen as the preferred course of action, the objective is to access the pulp chamber, remove material from the root canal system, restructure and clean the channel, and obturate with gutta percha (Berman & Hargreaves, 2020).

Recent years have seen a remarkable advancement in endodontic retreatment. Silver point or any other metallic obstacles that are found in the root canal can currently be removed using a variety of procedures. It comprises employing various burs, specialised forceps, direct or indirect ultrasonic instruments, peripheral filing in the presence of solvents, chelators, or irrigants, and mechanical adhesion techniques for microtube distribution (Goerig, Michelich & Schultz, 1982).

The case report describes the nonsurgical retreatment of a lower left mandibular molar complicated with partially removal of silver point and discusses the prognosis after treatment and follow up by phone five years after the completion of treatment.

CLINICAL CASE REPORT

A 46-years-old Chinese female was referred from a general private practitioner for the endodontic management of 36. The tooth had been endodontically treated 30 years before; subsequently the patient complained of occasionally mild discomfort that last a few second without any stimulating factors at the lower left molar. She started to experience the mild discomfort after her permanent filling was dislodged. The patient presented with eczema and controlled. She was a regular dental attendee and keen to keep her dentition intact as long as possible. Patient is a housewife. She is a non-smoker and non-drinker, with bruxism habitat nighttime (according to her husband).

Upon extra-oral examination, her face was symmetrical. As her temporomandibular joints presented with no clicking, no tenderness to palpation and no deviation upon opening and closing. There were no lymphadenopathy was detected in submental, submandibular and cervicular region.

An intra-oral examination presented that her oral hygiene was fair with generalized mild deposit of plaque and calculus (Figure 1). All permanent teeth were present except 18, 28, 37, 38 and 46. There were attrition of 12 and 13. Occlusal amalgam was noted in 48. Composite restorations were noted on 36 and 47 (Figure 2). Periodontal probing in all teeth was within normal limits and normal mobility was detected in all teeth. The tooth 36 was tender to percussion but not tender on palpation; periodontal probing and mobility was within normal limits. There was a large occluso-buccal composite restoration with a distal crackline.



Figure 1: Clinical frontal view

Periapical radiograph showed the presence of silver points, which short about 2mm for the distal canal. Well-defined periapical radiolucency was observed around the mesial and distal canal (Figure 3). A working diagnosis for 36 was chronic apical periodontitis with short silver points root canal filling.



Figure 2: Clinical occlusal view of upper and lower arch



Figure 3: Pre-operative radiograph

After examining the advantages and disadvantages, the prognosis and various treatment options with patient. Patient agreed to proceed with non-surgical root canal treatment retreatment of 36 despite knowing the prognosis is guarded.

Non-surgical root canal retreatment of tooth 36 was performed under inferior dental block and buccal infiltration (Xylocaine® with 1:80,000 adrenalines), rubber dam isolation and magnification from a dental operating microscope.

Access cavity was prepared after the occluso-buccal composite restoration was removed and restored with GIC, stabilized with an orthodontic band. Cotton pellet was present during the coronal restoration removal. The periphery of the access cavity was redefined to facilitate straight line access. The pulp chamber was flooded with chloroform solvent to dissolve the cement surrounding the silver points (Figure 4). Hedstrom files and DG-16 endodontic explorer were used to carry the solvent deeper surrounding the silver points. Space was created beside the silver points with small Hedstrom files (size 15) as apically as possible. Indirect ultrasonic vibration was utilized by transmitting vibration via the endodontic explorer to loosen the cement. The silver points 'pop-out' when almost all the cements were removed. Three silver points were removed from tooth 36 (Figure 5). The distal crack line was traced, extending apically. During the removal procedure, a small fragment of silver points was separated in the mesio-lingual canal of 36 (Figure 6). Operator have failed in attempting to loosen and removed the fragment as the coronal fragment of the separated silver point was not visible under the dental operating microscope.

The mesio-lingual canal was blocked but able to be bypassed by small files (Figure 7). Operator failed to achieve patency for distal canal and have cause canal transportation. Patient was informed regarding the

condition of her tooth and keen to keep the tooth. After patency was achieved for mesio-buccal canal; working length was determined by electronic apex locator, then reconfirmed by periapical radiograph. All canals were prepared with ProTaper® instruments.

After obturation, bonded corono-radicular amalgam was placed (Figure 8). Patient was advised to return to the referring dentist for further management of 36. The prognosis of 36 was considered guarded at consultation. The prognosis was considered fair after treatment with the separated instrument in mesio-lingual and crackline extension apically. Operator have attempted to call for a six-month review, but patient was not available for the review session. Another attempted was made five years later, patient responded via phone that her tooth had been extracted due to fracture.



Figure 4: Clinical photo of the tips of silver points after access cavity



Figure 5: Clinical photo of silver points retrieved from 36



Figure 6: Intra-operative radiograph after removal of silver points

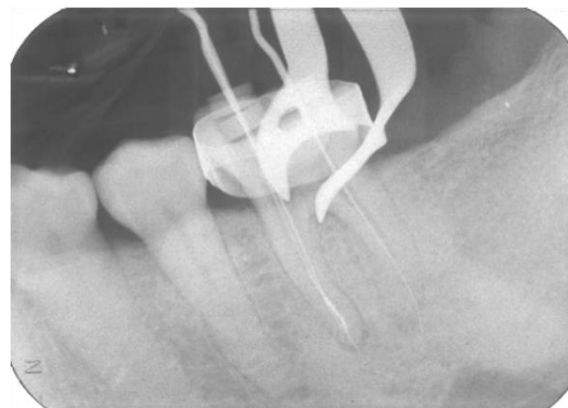


Figure 7: Working lengths

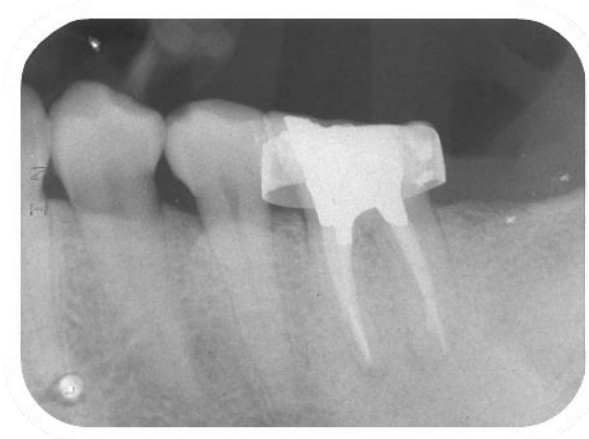


Figure 6: Intra-operative radiograph after removal of silver points

DISCUSSION

One of the crucial steps in root canal retreatment is to gain access of the root canals up to the apical foramen. All obstacles such as restoration materials, post and core, root canal filling, broken instruments and silver points should be removed (Berman & Hargreaves, 2020). However, if they were unable to be removed, the materials should be bypassed and attempted for removal. If not, it can be left in the canals and filled as far as possible.

Silver points have been introduced as the choice for fine tortuous root canal filling in the 1930s based on the limited technology on that era. With a light apical pressure on the rigid silver points, it pushed them down to the end of the canal preparation (San Chong, 2016). It does not fill the canal well and easily corrode with a high number of treatment failures (Rotstein & Ingle, 2019). Over time, the usage of silver points has declined tremendously. Now, it has become obsolete. However, once in a blue moon, dentists and endodontist may encounter this type of obturation and patient still want to save their teeth to maintain the function. In fact, not many recent papers reported silver point in the last 10 years.

There are few important tips which are essential during removal of silver points, as it is very soft and has the tendency to separate. Tremendous care should be emphasized during the removal of coronal restoration with rotating bur, not to damage the points. The application of solvent such as chloroform is highly recommended. It helps to soften thus dissolve the cement surrounding them, and to allow space for negotiation with small file (K-file size 10). If the silver points can be bypassed, removals aid the removal. Endodontics literatures are depleted with different techniques in retrieving silver points. Hedstrom files have been used in the 'braiding' technique, especially when there are no 'room' (silver points totally embedded within the root canal) for removal. These techniques 'hopefully' can engage the silver point and retrieve it. Other than that, 'braiding' also can be applied for separated silver point (Gulati et al., 2012; Gutmann & Lovdahl, 2010).

A short piece of fine stainless-steel tube over the guttered silver points, a Hedstrom file is pushed in a clockwise motion through the tube to wedge between the tube and the coronal part of the retrieved instrument was proposed (Suter, 1998). Steiglitz forceps is a specialized forceps with narrow beaks to allow access on gripping the coronal part of the silver points (Gutmann & Lovdahl, 2010). An additional grip can be achieved by using a haemostat on the beaks of the forceps to help its removal. Other alternative is to use special kit for such reason in the markets, for examples the Masserann Kit (MicroMega, Besancon, France), Endo Extractor (Brasseler, Savannah, GA, USA) and Instrument Removal System (IRS: Dentsply Tulsa Dental, Tulsa, Oklahoma, USA). Ultrasonic has been a favourite method in troughing the coronal end of the fragment. A similar result can be achieved by adapting the 'indirect' ultrasonic vibration transmitted via an endodontic explorer at the side of the silver points (Cheung, 2007).

When an instruments fracture during root canal preparations, the clinician has to weigh the benefit versus risk, with the factor related to the pre-operative and pulp status, canal morphology (i.e. curvature), position, length and type of fractured instruments and the total damage would be caused to the remaining tooth structure (Hülsmann & Schinkel, 1999) (Gencoglu & Helvacioğlu, 2009) There is no standardized procedure for a successful removal of fractured instruments. Each technique has its own strength and limitation. Therefore, many author suggested combined techniques in retrieving the fragment (Berman & Hargreaves, 2020; Cheung, 2007; Gutmann & Lovdahl, 2010). Dental operating microscopes are essential tools in the whole procedures. Location of the fragment and the shape of the root canal influence the success of non-surgical root canal treatment. Higher percentages of success rate of retrieving fractured instruments within a straight and wide canal (i.e. anterior teeth) than curved and narrow (i.e. mesiolingual canal of mandibular molars). The lowest are when the fractured instruments located at the apical third of the canal (Gencoglu & Helvacioğlu, 2009; Hülsmann & Schinkel, 1999).

Overzealous enlargement in achieving a straight-line access especially in narrow, thin and curved canals put them at risk of iatrogenic damage (i.e. stripping perforation, canal transportation) and thus predispose to perforation and vertical root canal (Souter & Messer, 2005).

For this case, the ML silver point was separated during removal. Under the operating microscope, the coronal part of the separated portion was not visible at the apical region. Patient was informed about the situation. Operator managed to bypass the separated silver point and fused it with the root canal filling. Within the fractured instruments cases, those with pre-operative lesions were 11.7% less likely to heal than those without the lesion. However, the presence of fractured instrument in the root filling itself did not compromise the prognosis (Spili et al., 2005). Patient was attempted for a review six month later and she was unable to be contacted. Another attempt was made for review five year later and reported that she already extracted the tooth due to fracture via phone.

CONCLUSION

Due to the nature of partially removal silver points, even though the prognosis is guarded at the time of obturation. After five years, it was considered favorable although it was extracted due to fracture.

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CONFLICT OF INTEREST

The authors declare that there were no conflicts of interest related to this case report.

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