Self Cure Acrylic and Stapler Pin Retrieval from Maxillary Central Tooth: A Case Report

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In dental practice, discovery of a foreign body entrapment within the root canal is not uncommon. The foreign object may have been accidently lodged due to traumatic injuries, iatrogenically during treatment or it may be a self-inflicted injury. The patient usually reports only when he/she experiences pain with foreign object discoverable on radiographic examination. In this report, a 20-year-old female was diagnosed with a stapler pin lodged in a permanent maxillary central incisor canal along with self cure acrylic.

KEYWORDS: Apexification, Mineral trioxide aggregate, Stapler pin

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INTRODUCTION

Foreign objects may act as a possible cause of infection. Early diagnosis and treatment becomes mandatory in such cases to avoid further complications. Thorough case history, clinical, and radiographic examinations are essential in determining the nature, size, location of the foreign body, and the difficulty involved in its retrieval. A variety of foreign objects has been reported to be lodged in the root canals such as pencil lead,resin,needles, metal screws, beads, and pins. Grossman reported retrieval of indelible ink pencil tips, brads, toothpick, absorbent points, and tomato seed from the root canal of anterior teeth.[1] Many other authors have reported the presence of, a plastic chopstick embedded in an unerupted supernumerary tooth and hat pins, dressmaker pins, toothbrush bristles, and crayons fractured inside the root canals of the teeth.[2,3] These foreign bodies inside the tooth eventually leads to infection resulting in pain, bleeding, and swelling, infection and recurrent abscess.[4,5,6]

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CASE REPORT

A 20 year old female patient resident of Mandi Bahuddin reported to Outpatient department of Rawal Institute of Health Sciences on Ist February 2020 with the severe pain in #21.On taking detailed history patient informed that tooth #21 was operated 4 years back with root canal treatment in local dental setup at Area of Mandi Bahuddin, Pakistan. The previous operator placed wire like thing inside the tooth and filled it with white color material, Pain along with associated swelling started few days back within the tooth,more on biting,continuous in nature in upper anterior maxillary quadrant,that radiated to upper right lip. The swelling reduced gradually in size. Patient was otherwise medically fit and well.Extra oral examination was non contributory,while during intraoral examination soft tissue mucosa overlying #21 was tender on palpation with erythemia, tooth was tender on percussion, tooth was filled with irregular rough filling material having pointed edges and was associated with plaque. On radiographic examination a vertically placed wire was found having a bend ,which was suspected to be a stapler pin or broken file at that time.After following the history and examination of the patient,she was diagnosed with apical periodontitis was diagnosed as cause. She was recalled after one week and treatment plan was discussed with the patient, Two options were given to the patient keeping in mind her financial status, First option included stepwise removal of the filling material, retrieval of the

foreign object from canal, apical barrier formation of apex ,if required localized crown lengthening to achieve ferrule, obturation, endo post buildup and crown and second option included to extract the tooth and replace it with implant. Patient opted for first option, treatment cost was discussed and informed consent of patient was taken.

At the first visit, patient was explained verbally again for the steps of treatment. Localized infilteration was given for #21,and small round carbide bur was used to remove restoration,During removal it was identified that the restoration was self cure acrylic which not appreciable during radiographic examination. It is a carcinogenic material which is not recommended for restoration, the buildup was removed. However, the foreign object removal from canal was quite complicated as self cure acrylic had flown with in the canal space and was hard in texture.Small tapered fissured 11 bur was used to remove the acrylic around the object,to minimize damage to the tooth structure of lateral wall of the canals and a purchase point was made in object as hook,vertical forces was given using a periodontal explorer with in this created hook and object was retrieved after few strokes. On removal it was confirmed to be the stapler pin,10mm in length, which was cured with self cure acrylic within the canal, #80 K endodontic file was placed to determine working length as radiograph was taken. Canal was prepared minimally and irrigated with 5.25% sodium hypochlorite to clean the walls with associated pus coming out of it, there was no apical stop found, determined working length short of apex was found to be 18.5mm,canal prepared upto #80 K as shown in the (figure 1,2,3,4.) Calcium hydroxide as intracanal medicament was placed with temporary dressing and patient was recalled after 3 weeks.

Figure 1, 2: Clinical and Radiographic examination of stapler pin in #21

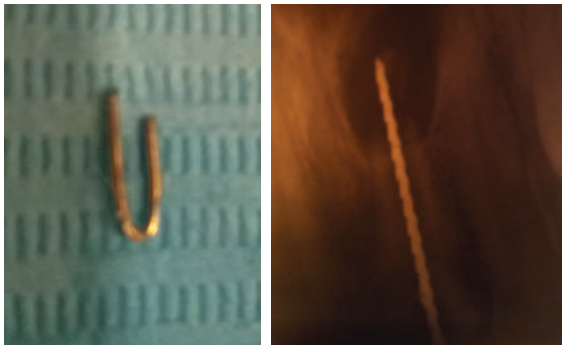

Figure 3, 4: Retreived stapler pin from the canal and working length determination with #80K file

At second visit temporary dressing was removed and canals were cleaned again and fractured debris remnants came out of canal on irrigation, working length was again reconfirmed. Split rubber dam isolation of tooth and single visit MTA barrier apexification was done, with apical plug of 4 mm. On subsequent day as MTA hardened as barrier, endo post was selected and inserted into canal for intraradicular retention for the foundation restoration. As shown in figure 5,6,7,8.

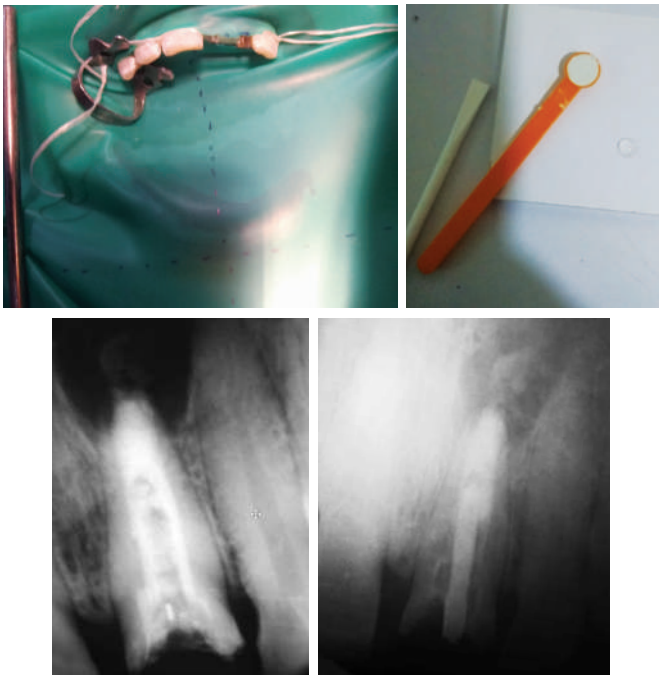

Figure 5,6,7,8: Split dam isolation of #21,Manipulation of white MTA powder liquid ratio 1:1,MTA apexification,endo post builduplength determination with #80K file

However it was found that tooth did not had enough available structure left that can be used to provide foundation restoration as well as ferrule for crown, so localized crown lengthening of anterior maxillary including #11, #12 ,#21, #22 was done to cater the pink gingival esthetic balance and to get enough tooth structure of #21 for restorations.

At 3rd visit after 3 months, gingival marginal healing was noted to be satisfactory, nano hybrid composite (Prime-dent) was used as foundation restoration and crown cutting was done with crown margins available and prepared for extra radicular retention of the crown. Crown shade A2 was selected by clinician herself and patient's attendee.

Figure 9, 10: Post crown lengthening with healed gingival margins and foundation restoration,Porcelain fused to metal coronal restoration of tooth #21

Subsequently at 4th visit after one week, Crown was inserted with good marginal fusion and natural midline space, which patient wanted to be in there as before when she had natural #21. Patient seemed quite happy and satisfied and was recalled for follow up as shown in figure 9 and 10.

DISCUSSION

A variety of foreign objects have been reported within the canals of the patient including pencil lead, needles, metal screws, beads, and pins. Our case reported presence of stapler pin in the canal. Presence of stapler pin or any other foreign body with in the canal is usually an incidental finding, trauma or habitual psychological disorders. However, it was not the cause in our report, as the treatment was already performed by clinician or quack; who placed the stapler pin and self cure acrylic in the canal.This ,further detoriated the tooth situation which for the time being looked esthetically pleasing but proved non beneficial for the patient in the long run. Use of self cure acrylic is a common malpractice in dentistry. It is a carcinogenic and toxic material to tooth structure and mucosa itself because of presence of monomers.[7]

Level of difficulty of endodontic cases can be ruled out by proper history of the patient and examination, Radiographic examination played a vital role in such cases, as it gives clinicians an idea regarding the of level of obstruction present within the canal.[8,9,10] In our case, level of difficulty was predicted initially as highly difficult case due to presence of foreign body within the canal, thin roots and wide apex. The factors influencing the removal of foreign objects are affected by the diameter, length and position of the obstruction within a canal and the skill of the operator. Although the technology is advanced, still the success rate for the removal of foreign objects from the pulp canals is 55- 79%.We used the tapered fissure bur to remove and retrieve the stapler pin manually, literature reported use of instrument retrieval systems, H-files, ultrasonic scaler tips too in addition to bur. However, this whole procedure should be done with minimal removal of natural tooth structure. This point is supported by McCullock too who reported that access to a foreign object is improved by the removal of small amount of tooth structure. According to Walvekar et al., if a foreign object is snugly bound in the canal, the object may have to be loosened first and then should be removed with minimal damage to the internal tooth.We tried to achieve the same approach in our case by first loosening and removing the stapler pin from self cure acrylic and then making a purchase point in it to remove it with rocking strokes with explorer with minimal damage to tooth. Previous cases also reported use of Stieglitz forceps to remove silver and steel points.[8,9,10]

For the current case calcium hydroxide was used for canal disinfection which is in agreement with few past studies. Foreign object retrieval and calcium hydroxide dressing can help eliminate chronic peri-apical infections. However few reported use of tri antibiotic paste too.[10] For the current case Mineral trioxide aggregate one step apexification was used to form artificial barrier of maxillary central tooth apex. However currently calcium silicate based cements in the form of biodentine were also used by some researchers because of its potential to form mineralization zone and its less setting time of 12 min as compared to MTA. One case reported by Sharma and colloquies used biodentine in the near past.[1,11]

For Intra radicular retention metallic post was used in current case. As jotkowitz and colloquies described that a ferrule of 1 mm of vertical height successfully doubled the resistance to fracture versus teeth without a ferrule, and appears to be the minimal acceptable amount of ferrule height which is required.We did localized crown lengthening of four anterior maxillary teeth to get acceptable ferrule height of #21, to get natural tooth structure for composite foundation restoration retention as well as extraradicular retention for #21 crown and symmetric gingival margins.[11]

CONCLUSION

Addressing and treating such problems at right time is necessary to avoid complications as well as abusive use of self cure acrylic should be reported.A step wise evidence base approach should be used to remove foreign bodies like self cure and stapler pin from the root canal to prevent infections.

DISCLAIMER

It is stated the views expressed in the submitted article are our own.

SOURCE OF SUPPORT

Study included patients data who reported to out patient department at rawal institute of health sciences.

CONFLICT OF INTEREST

We, as the authors of case report, do hereby mention that work done in this case report is exclusively our and has no conflict of interest with any author and institutions.

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