Accidental separation and lodgment of rotary endodontic file into the dentist’s thumb

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ABSTRACT

Separation of the endodontic instrument within the root canal system and sharp injuries to the dentist is not an uncommon event in endodontic practice. Although root canal instruments can fracture at any stage of endodontic treatment, its fracture within the dentist’s hand is a very rare event. An unusual case of accidental separation and lodgment of rotary endodontic file in the dentist’s thumb is presented along with its management. A 33-year-old dentist reported with an accidental lodgment of rotary endodontic file into his thumb. The fractured instrument was removed successfully by a surgeon. The present case describes a rare event of occupational risk in endodontic practice.

Key words: Endodontic file, lodgment, occupational hazard, rotary, separation

Modern dentistry has been described as probably among the safest of all occupations; however, many risks remain in dental practice which continues to challenge this status. These include percutaneous exposure incidents (PEIs), exposure to infectious agents, including bioaerosols; musculoskeletal disorders, eye injuries; exposure to radiation, noise, and dental materials; vibration-induced neuropathy; and psychological disorders. Of these various occupational hazards, PEI remains a matter of serious concern, as there is an almost constant risk of exposure to serious/life-threatening infectious agents such as hepatitis B virus (HBV), hepatitis C virus (HCV), human immunodeficiency virus (HIV), and prions. PEI is a broad descriptive term that includes needlestick injuries (NSIs), as well as cutaneous and mucous exposures to blood and saliva resulting in transmission of blood-borne infections between patients and dental personnel.[1]

Separation of the endodontic instrument in the root canal system is a known iatrogenic incident in endodontic practice.

However, rotary endodontic file causing PEI is a rare event. We report an interesting case of accidental separation of the rotary endodontic file into the dentist’s thumb and suggest guidelines to be followed in such an event.

CASE REPORT

A 33-year-old right-handed male dental surgeon was performing endodontic treatment on the permanent mandibular right first molar. While cleaning the rotary endodontic file (SX, Dentsply, USA), he accidentally switched on the endodontic motor which resulted in winding of the rotary endodontic file in the left-hand glove. Dentist noticed that the endodontic file was fractured. A careful search for the separated endodontic file in the damaged glove by the dentist was unsuccessful. During the examination of the left hand, the working dentist noticed a pinpoint bluish discoloration on the left thumb. He immediately reported this incident to his senior associate dentist. Subsequent radiograph of the left thumb using intraoral periapical radiographic film revealed a radiopaque object resembling a separated endodontic file in the soft tissue [Figure 1].

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The dentist reported to the general surgeon, who under local anesthesia removed the fractured portion of the endodontic file successfully [Figures 2 and 3].

Before the surgery dentist received prophylactic booster dose of tetanus toxoid along with amoxicillin 500 mg thrice daily for 5 days orally. Dentist was already immunized for HBV. Postoperative healing was uneventful. Both the dental surgeon and the patients HIV, HBV, and HCV status was ascertained which turned out to be negative. The same results were obtained when the tests were repeated at 3 and 6 months intervals.

**DISCUSSION**

Despite numerous technical advances in recent years, modern dentistry still faces many occupational health hazards.[1] NSIs present the greatest occupational risk for transmission of blood-borne pathogens such as HBV, HCV, and HIV.[2] Statistically, the risk of transmission of infection is low; however, the consequences of virus transmission are serious.[3]

Needlestick injuries (NSIs) are punctured wounds, cuts, or scratches inflicted by medical instruments intended for cutting or puncturing (cannulae, lancets, scalpels, etc.) that may be contaminated with a patient’s blood or other body fluids. Contact of blood with non-intact skin and contact with mucous membranes (eye, mouth, nose) are also subsumed under the term “needlestick injury.”[3]

Definition of NSIs does not describe all the exposure events/injuries taking place in dentistry. We have preferred the term PEI over NSI because dentistry is a specialty which deals not only with sharp objects but also rotary instruments moving at high speed which make the operator more vulnerable to occupational exposure to body fluids.

According to the World Health Organization, approximately 3 million PEI occur worldwide each year among health-care workers.[4] However, there is insufficient data regarding the incidence of PEI among dentists.

We have reported an unusual case of PEI in a dentist caused due to accidental separation and lodgment of rotary endodontic file, which has not been reported in the literature. We suggest procedural guidelines to be followed in such cases [Table 1].

Since it is not always possible to determine HBV, HCV, or HIV status from a patient, the use of personal protective measure is mandatory. It is important that dentists continue to follow strict infection control guidelines for glove tears, and ensure that skin cuts and grazes are covered by waterproof dressing in the event of bodily fluid penetrating the gloves.[1]
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Karnik, et al.

Indian Journal of Dental Research, 27(6), 2016

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Repeatedly emphasized throughout continuing dental education. Regardless, prevention of occupational exposure to PEI should be a priority as a national policy. All dental practices should provide an educational project for training staff members to prevent PEI and should have a comprehensive written program including procedures for reporting and providing medical follow-up for the same.[3]

Table 1: Procedural guidelines to be followed in case of accidental separation and lodgment of endodontic file into the dentist’s hand

| Steps | Procedural guidelines |
|-------|-----------------------|
| 1     | Do not panic          |
| 2     | Stop working and relieve the patient |
| 3     | Search for the separated instrument |
| 4     | In case the separated instrument is not traceable, perform careful examination of the nonworking hand |
| 5     | Search for a fresh injury along with any pin point bleeding spot |
| 6     | Radiograph of the concerned area should be taken to locate the presence, position and depth of the separated instrument (in case of a finger injury, an intraoral periapical radiograph may be utilized) |
| 7     | In case of presence of separated instrument, visit the surgeon for removal of the same |
| 8     | Patient and dentist (self) should be investigated for HIV, HBV, and HIV status |
| 9     | Receive HIV postexposure prophylaxis |
|       | ART: Receive triple therapy (zidovudine and lamivudine plus a protease inhibitor such as ritonavir-boosted lopinavir, if available). Otherwise, dual therapy with zidovudine and lamivudine is indicated. Appointments for 4 follow-up visits should be scheduled (after 2 weeks, and 1, 3 and 6 months). Full blood counts should be checked at baseline and the first two follow-up visits. HIV, HBV, and HCV tests are scheduled after 3 and 6 months[4] |
| 10    | In case of a positive anti-HBV test, 6 weeks after the initial PEI, receive booster immunization for the same |

HIV=Human immunodeficiency virus, HBV=Hepatitis B virus, ART=Anti-retroviral therapy, HCV=Hepatitis C virus, PEI=Percutaneous exposure incidents

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Leggat PA, Kedjarune U, Smith DR. Occupational health problems in modern dentistry: A review. Ind Health 2007;45:611-21.
2. Cheng HC, Su CY, Yen AM, Huang CF. Factors affecting occupational exposure to needlestick and sharps injuries among dentists in Taiwan: A nationwide survey. PLoS One 2012;7:e34911.
3. Himmelreich H, Rabenau HF, Rindermann M, Stephan C, Bickel M, Marzi I, et al. The management of needlestick injuries. Dtsch Arztebl Int 2013;110:61-7.
4. van der Maaten GC, Nyirenda M, Beadsworth MJ, Chitani A, Allain T, van Oosterhout JJ. Post exposure prophylaxis of HIV transmission after occupational injuries in Queen Elizabeth Central Hospital, Blantyre, Malawi, 2003-2008. Malawi Med J 2010;22:15-9.