Apply ‘Dam’ before you say ‘Damn’: A case report

Abstract: With increasing legal implications in dental practice, one has to be careful so as to avoid accidents in practice. Although rare, instrument aspiration or ingestion during endodontic treatment without rubber dam can result in clinical complications and subsequent legal proceedings. The purpose of this paper is to present a case report of an accidently aspired endodontic file with emphasis on the preventive measures to avoid such an accident and management if such mishap occurs.

Keywords: Iatrogenic, ingestion, aspiration, foreign body, rubber-dam.

INTRODUCTION:

Accidents are unavoidable incidences that happen when we show negligence and when we do not take preventive measures.[1] Iatrogenic accidents during any dental procedure are uncertain and despite of all the precautions taken they still happen.[2]

A serious complication of clinical dentistry is the aspiration or swallowing of an instrument used in oral cavity.[3] Ingestion or aspiration of instruments or materials used in treatment can occur in every field of the dental profession.[4] However such accidents occur especially if the procedure is done without the application of a rubber dam.[5] It occurs mostly in children (73-80%) but can occur in adults also, especially patients having psychiatric problems or mental retardation.[1] These foreign objects can be sharp or blunt and of different sizes and shapes. Small prosthesis like endodontic instruments, tooth, mirror heads, crowns, orthodontic brackets and rubber dam clamps are the objects that have been ingested as per reports.[1] Other commonly ingested sharp objects also include sewing needles, tooth picks, chicken and fish bones and paper clips.[6]

Grossman (1974) reported that such iatrogenic errors occurred most frequently when treating posterior mandibular teeth. Grossman (1971) also determined that 87% of foreign bodies entered alimentary tract, whereas 13% aspirated into the respiratory tract.[7] It has been reported that in

most of the cases the foreign bodies pass through gastrointestinal tract without difficulty, in 10-20% of cases require non-surgical intervention, while 1% or less require surgery.[8] Aspiration, on the other hand is more serious, it has to be retrieved otherwise it may cause serious respiratory complication like obstruction which can lead to death.[1] Airway should be maintained by the operator and immediate medical care should be taken for the patient.[1] The management of such accidents should not be delayed as they may cause severe sequelae and can be lethal. Such accidents are also a cause of emotional distress to the patient and can also diminishes the status as well as morale of the dentist.[2]

Foreign body ingestion or aspiration may cause various clinical complications such as damage to the digestive tract, abscess formation, peritonitis, septicemia, pneumonia, foreign body granuloma, fistulas, and duodenocolic fissures. The risk of injury increases when the size of swallowed object is more than 5cm or has a pointed shape.[8] The dentist should have basic knowledge about the diagnostic procedures, complications, and methods of retrieval as well as an ability to reassure the patient.[4] This article attempts to highlight the risks associated and management of aspirated/ingested cases along with case report of endodontic instrument aspiration while doing RCT in a dental college.

CASE REPORT:

A 33-year-old healthy female patient came to the Department of Conservative Dentistry and Endodontics Swami devi dyal dental college and Hospital, Barwala, Haryana complaining of pain in the left lower Ist premolar (tooth no 34). Root canal treatment was carried out without the application of rubber dam as the coronal structure of tooth was severely broken down. While doing biomechanical preparation (BMP) the patient coughed and the 20 K-file slipped accidently into the posterior region of oral cavity, the operator bent aside to pick-up tweezer so that file could be retrieved and in the mean while patient swallowed that instrument. There was no floss tied to the instrument. Attempts were made to retrieve the file but were not successful.

Patient was immediately sent to the general hospital for an immediate Posterior-anterior chest and abdomen radiograph to locate the instrument. On radiographic examination a radio-opaque object in the right bronchus was observed (Fig 1). Patient was asymptomatic, there was no

difficulty in breathing, respiratory rate was normal. The patient was explained about the situation and presence of the instrument in the lung and was immediately referred to pulmonary medicine department of PGI Chandigarh to attempt its removal. After the consent form was signed by the guardian of the patient, fiber-optic bronchoscopy was planned and under local anesthesia it was carried out successfully. Post-operative radiograph was taken (Fig 2). While taken proper precautions by using floss tied to files and gauze screen, root canal treatment of Left mandibular Ist premolar (tooth no 34) was completed successfully after that. Patient was asymptomatic at her 6 months recall visit.

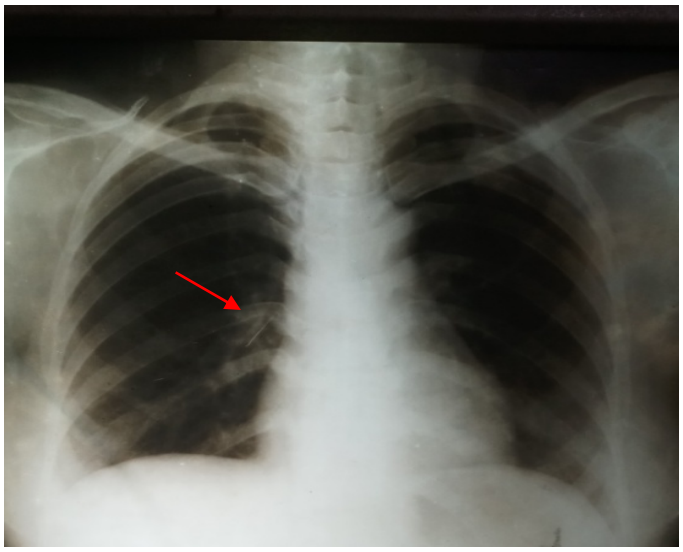

Figure 1: Radiograph showing endodontic file in right bronchus

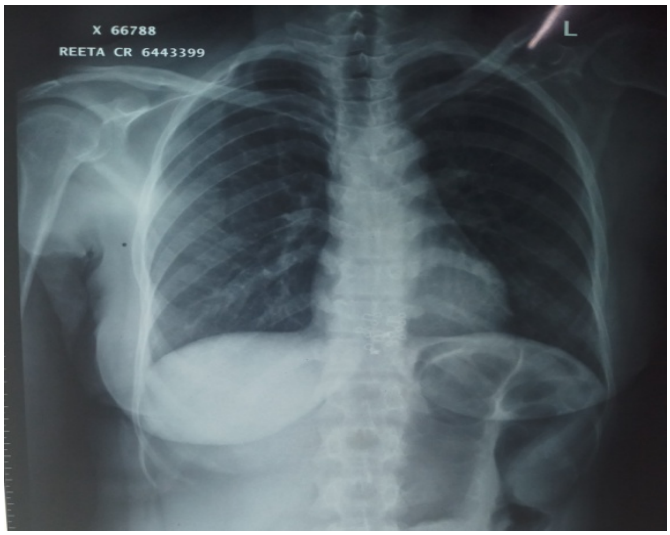

Figure 2: Post-operative radiograph showing no instrument in the right bronchus

Figure 3: Retrieved endodontic K-file

DISCUSSION:

Accidental foreign body ingestion and aspiration are among myriad emergencies that seem to arise in dental practice. However, the actual documented occurrence of such incidences of accidental ingestion during clinical dental treatment may be under reported. The episodes although are said to be few in occurrence or occasionally, still happen despite being entirely preventable.[9] According to Susini et al, the prevalence of aspiration of endodontic instruments was 0.0009 per 100,000 root canal treatments and prevalence of ingestion was 0.08 per 100,000 root canal treatments.[10] Dentists have to be aware of patient-related factors also which make the patient more prone to swallow foreign bodies e.g. children, patient with excessive gag-reflex small oral cavity and short palate. Also patients with acroglossia, a thick neck, overweight patients, pregnant women and patients on medications especially those with psychiatric diseases. These patients should be informed and instructed to control swallowing reflex. Patients in which the coordination of the deglutition and cough reflexes are affected should be treated in a more upright position.[8]

Safety during treatment is an important component of root canal therapy.[11] In endodontics, it is possible to minimize the risk of inhalation and ingestion of root canal instruments by using a rubber dam on a routine basis.[4] The use of rubber dam for root canal treatment is mandatory.[12] Practitioners must take precautions to prevent patient aspiration or ingestion of instruments by using rubber dam at all times during endodontic therapy. Students learning in a dental institute are prone to make mistakes while learning. Rubber-dam application is always advised and is must to use it in all root canal treatment cases but still it is at times neglected. The significance of floss attached to the instrument all the more becomes relevant with the students doing root canal treatment. In this case both these methods were neglected thus, making it accident prone. Treatment with a rubber dam serves many purposes including patient protection from aspiration or swallowing of instruments, retraction of hard and soft tissues, improved visibility and prevention of contamination of root canal system. The most important purpose is patient safety. Yet a recent national survey showed that only 59% of general dentists and 92% of endodontists routinely use rubber dam during root canal treatment.[11]

If the patient is allergic to Rubber dam, latex free rubber dam should be used or rotary files should be preferred to hand files for root canal treatment. If patients can't tolerate this safety measure due to high gag reflex, then they should be seated more upright, with head turned to one side. If hand files are to be used, a thread or dental floss should be tied around the file handle so that it can be retrieved if accidently ingested. Rubber dam reduces aspiration or ingestion of any instrument but on the other hand its clamp can also be accidently aspired if precautions are not taken. To avoid this risk, Alexander and Delholm [13] and Meyers have suggested that dental floss be used to secure the clamp.[14] The gauze screen (4×4 inch) is placed in the posterior oral cavity to prevent the access of any prosthesis to the oropharynx in case of orthodontic patients and patients with prosthetic appliances.[2] Clinicians should always work in a dry environment rather than wet to minimize the chances of slippage through the clinician's fingers.[5] In case tooth is severely broken down split dam technique can be used.[15]

Swallowed objects can get lodged in the pharynx, esophagus, stomach, instestines or simply pass through the gastrointestinal tract. Aspirated foreign bodies can get lodged in the larynx, trachea or bronchus and is more serious situation with the possibility of suffocation.[10]

The majority of ingested foreign bodies pass spontaneously but serious complications such as bowel perforation and obstruction can occur.[8] In case of aspiration, first line of management is to localize the foreign body on radiograph. It helps to detect the presence/absence of the lost object, as in our case before proceeding to the treatment first of all radiograph was taken to locate the instrument which was found in the right brochus and then after locating the aspirated endodontic file bronchoscopy was performed successfully. As compared to the conventional radiographs computerized tomography (CT) has many advantages. It helps in visualizing the radio-opaque foreign bodies and the alveolar collapse. CT scan can detect a foreign body in the lumen of trachea-bronchial tree, as also it gives a three-dimensional image of foreign body.[16] Aspirated foreign body is a medical emergency that requires immediate intervention. Management of ingested dental objects depends on the nature of the object, the anatomical location of the object and patients clinical condition. Localization of an impacted foreign body by means of radiography is important before endoscopic approach. Contrast radiography or CT may be required to localize radiolucent objects such as dental prosthesis and toothpicks. Conservative

monitoring is appropriate if the patient ingested a dental object that is not sharp or irregularly shaped, is less than 2.5 cm in diameter an less than 6 cm in length. Confirmatory radiographic documentation of passage is mandatory when using a conservative approach. During the period of watchful waiting, the patient should eat a high-fiber diet, watch stool to confirm the passage of object and look for symptoms such as fever, pain, black stool or bleeding that can suggest ongoing complications. If passage of a blunt foreign body is not confirmed within seven days, or if the patient becomes symptomatic, the clinician should obtain abdominal radiograph and refer the patient to a physician for endoscopic retrieval.[17]

When an iatrogenic accident occurs, it is very important not to panic. The operator should know how to manage the situation and he should be able to recognize signs and symptoms of airway and gastric obstruction if any instrument is lost in oropharynx. The patient should be immediately placed in a reclined position, and asked to cough forcibly to clear airway. If still there is no improvement, and patient is having symptoms like choking, inspiratory stridor, forced breathing then Heimlich maneuver should be initiated to remove the obstruction. If the object is not retrieved then basic emergency life support must be given till any definite treatment.[2]

If airway is not compromised, the lost instrument should be assessed. If it is found in the oral cavity, it should be retrieved immediately and confirmed that it is intact or not and patient should be reassured. If object is not retrieved patient should be informed about the consequences and must be immediately shifted to the near by emergency unit to know the status of lost object using diagnostic tests (radiograph or CT scan) and help to decide the required medical action.[2]

If the foreign body has entered into the respiratory tract, before removing it, its anatomical location must be identified to avoid any further complications. Once the foreign body is localized, the treatment for removal of aspirated object is bronchoscopy.[2]

If the foreign body is present in the GI tract, its treatment is determined by the patients clinical condition, location of the object, nature of the object and time since the ingestion. The object can get impacted in the pharynx, pyrolus, duodenum, colon, appendics, anus or patient who has undergone any previous GI surgery. The treatment of choice to retrieve such objects in the GI tract is the flexible endoscopy.[2]

Thus, if precautions would have been taken this accident might not have happen.

CONCLUSION: To avoid complications preventive measures should be taken. These mishaps can be prevented by rubber dam application, tie floss on instruments and use of gauze screen. Dentist should have proper knowledge of signs and symptoms and should know how to manage such situations whenever any mishaps have happened and appropriate potentially life-saving treatment should be given.

Consent: After the consent form was signed by the guardian of the patient, fiber-optic bronchoscopy was planned and under local anesthesia it was carried out successfully.

Ethic: NA

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