Review Article

Accidental Ingestion of Foreign Body in Dental Practice and its Management

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Abstract

Foreign body aspiration or ingestion can be a potential complication or a life-threatening emergency situation. During routine dental treatment, the handling of dental objects requires particular care, especially with dental bridges and files. Precautionary measures have to be taken to avoid such situation. A dentist must be able to manage emergency situations in which accidental swallowing of dental instruments and materials occur. This article reviews the signs and symptoms, management, complications, and precautions of aspiration or ingestion of foreign bodies.

Keywords: Aspiration/ingestion, dental practice, foreign body, management, prevention

Introduction

Ingestion of foreign bodies is most commonly a problem in young children. In adults, it occurs accidentally more commonly among those with psychiatric disorder, mental retardation, use of local anesthetic, and altered consciousness associated with intravenous sedation. Swallowing of dental materials and devices may lead to serious complication during dental treatment. Any object routinely placed into or removed from the oral cavity during dental or surgical procedures can be aspirated or swallowed.[1,2] These items can include teeth, restorations, restorative materials, instruments, implant parts, rubber dam clamps, gauze packs, and impression materials. The majority of foreign bodies that reach the gastrointestinal (GI) tract pass spontaneously. However, 10%–20% of cases require nonsurgical intervention while 1% or less may require surgery. Foreign body aspiration may cause damage to gastric mucosa, septic abscess, intestinal perforations, partial or complete airway obstruction, postobstructive pneumonia, respiratory distress, pneumothorax, or hemorrhage. If these cases are not properly managed and timely intervention is not carried out, it can be lethal. Therefore, general dental practitioners should be aware of a protocol of management and prevention of swallowing or aspiration of dental objects.[3]

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Incidence

Foreign body aspiration is rare in adults. Under the age of 15 years, it is seen around 18% of the cases. Around 27% of dental bridges have been reported to be aspirated. Orthodontic appliances, endodontic files, or components of loose dentures are the second most commonly ingested objects. Cast or prefabricated restorations, which are to be cemented, have a higher chance of aspiration.[4-6] Ingestion of foreign objects was observed during root canal treatment around 0.12/100,000, whereas endodontic instrument ingestion was around 0.001/100,000. Orthodontic appliances are less commonly aspirated but not less varied in types of involved appliances.

Types of Foreign Bodies

Dental objects used during dental procedure and surgical procedures. These can range from teeth, instruments, to the clamp of rubber dam, restorative materials, gauze packs, and impression materials. Fixed prosthodontic appliances are the most common to ingest followed by orthodontic appliances among all dental specialties.[7,8]

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Signs and Symptoms

This is highly variable and depends on whether it is a child or an adult. Any symptoms or signs are also largely dependent on where the object is impacted. About 75% of children who have an impacted foreign body will have it at the level of upper esophageal sphincter while roughly 70% of the adults have impaction at the level of the lower esophageal sphincter.[1,3]

Foreign body at oropharyngeal level

Overall, about 60% of the foreign bodies become trapped at this level; patients usually have a clear sensation of something being trapped, discomfort, drooling of saliva, inability to swallow, airway compromise and also infection and perforation can also occur.[3]

Foreign body at esophageal level

In adults, there are acute sensation, vague presentation of something being struck at the center of the chest or epigastric region, dysphagia, and salivary drooling/pooling. In children, it presents with gagging, vomiting, retching, neck or throat pain, inability to feed, failure to thrive, fever, recurrent aspiration pneumonitis/pneumonia, or respiratory embarrassment/stridor (due to tracheal impingement).[1]

Foreign body at subesophageal level

It may present with no symptoms such as abdominal distension and discomfort, fever, recurrent vomiting, passing rectal blood, and melena, and other symptoms of acute or subacute intestinal obstruction may also be present.[1]

Symptoms due to gastrointestinal perforation

It present with acute mediastinitis with chest pain, dyspnea, and severe odynophagia along with signs of pneumonitis/pleural effusion and acute/subacute peritonitis.[1]

Foreign body in airway

It is an acute emergency and presents with the respiratory arrest, stridor, and classic triad of wheezing, coughing, and dyspnea.[1]

Diagnosing Methods

Careful examination of the entire oral cavity, pharynx, larynx, and esophagus should be the initial step taken. Investigations such as abdominal and chest X-rays, endoscopy, and computed tomography scans of thorax and abdomen are the secondary diagnosing methods to be taken if necessary.[3]

Complications

Oropharyngeal foreign bodies

- Scratches and lacerations of oropharyngeal mucosa
- Perforation
- Retropharyngeal abscess
- Soft tissue infection and abscess.[6]

Esophageal foreign bodies

- Scratches, lacerations, or abrasions of mucosa
- Esophageal necrosis
- Retropharyngeal abscess
- Esophageal stricture
- Esophageal perforation and subsequent paraesophageal abscess
- Mediastinitis
- Pneumothorax and pneumomediastinum
- Pericarditis/cardiac tampanode
- Tracheoesophageal fistula.[6]

Gastric small intestine foreign bodies

- Entrapment of object within Meckel's diverticulum
- Perforation leading to peritonitis and advanced sepsis
- Acute and subacute small intestinal obstruction.[6]

Management

When any dental instrument is aspirated/swallowed

- Act quickly to locate and remove any object that may be causing acute upper airway obstruction. Keep the patients head low, turn it to the side, ask the patient to cough, and administer sharp blows on the patients back
- If an object is visible, grasp it with small forceps, or use a suction tip, being careful not to push it deeper into the throat
- If it is not possible to grasp the object or if it is evident that the object is lodged in the airway (difficulty in breathing), then Heimlich maneuver may be attempted. In the Heimlich maneuver, place both hands one on top of the other, over the abdominal cavity just below the ribs, and pressed forcefully, the remaining air in the patient lungs is used to popout the obstruction. This maneuver should not be used, if there is a possibility of the foreign body being swallowed
- Aspirations of objects into the airway are usually present a more dangerous situation than does swallowing foreign body. Aspiration into the lungs usually involves right bronchus in adults because of the anatomic configuration
- Where airway obstruction is life-threatening and an object cannot be removed, then obtain urgent senior anesthetic/ear-nose-throat advice and/or consider cricothyroidectomy as a life-saving procedure
- Patients outside of hospital with significant airway/GI obstruction should be transferred as an emergency, in a sitting position, with a suction catheter available for them to use in removing excess saliva secretion[3]
- Children with upper GI obstruction and/or airway compromise should be allowed to stay in their patient's arms while being transferred to or assessed in hospital to reduce anxiety and worsening airway embarrassment. [1,3,5,6,9]

Indications of instability or a need for urgent transfer to hospital

- Airway compromise
- Drooling
- Inability to swallow fluids

- Sepsis
- Suspicion of intestinal perforation
- Evidence of active bleeding
- Stable patients who have swallowed small, smooth objects to have no evidence of esophageal entrapment, otherwise negative imaging with no evidence of damage, can often be managed conservatively with follow-up at 24 h or so to check that they remain well; passage of objects in stool may take days to weeks and parents should observe for their presence
- A diet high in roughage and frequent ingestion of soft food items, such as banana or moistened bread, may aid in the passage of swallowed foreign object.[3]

Preventive precautions

- Using rubber dam for restorations
- Placing gauze screen across the oropharynx
- Instruct patients to suppress the swallowing reflex and turn their head down if any object falls on tongue
- Treatment can be given in upright position whenever possible
- Temporary restorations adequately fixed and removable appliances retained
- The acrylic used on fabrication should be of radiopaque since it will be easier to locate after ingestion.[2,6]

Conclusion

Early recognition of swallowed foreign bodies during any surgical or nonsurgical procedures related to oral cavity is the key to avoid catastrophic effects. Conscientious patient selection, meticulous adherence to clinical procedures, periodic inspection of instruments and appliances for were and timely replacement if warranted, appropriate use of high-volume suction during high-risk procedures, as well as proper patient education are all vital factors in prevention. In this litigious era, it is our recommendation that appropriate consideration is to be given to the inclusion of such emergencies and their management in contemporary graduate curricula.

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Conflicts of interest

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