



REVIEW ARTICLE

ORTHODONTIC EMERGENCIES- A REVIEW

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ABSTRACT

Today orthodontic treatment is in growing demand and it is not limited to a specific age or social group. The nature of orthodontic treatment is such that the orthodontic wires and appliances, which are used to apply force and move the teeth, are exposed to the oral cavity. Orthodontic appliances or parts of orthodontic appliances are accidentally swallowed and have caused problems by entering either into the airway or the gastrointestinal tract. The broken orthodontic appliances, or components and dental instruments are the second most commonly ingested objects in adults. Aspiration or ingestion of orthodontic appliances is less common and depends on the kind of appliance. The orthodontic appliance or components that may be accidentally swallowed or ingested viz expansion appliance key, transpalatal arch during its removal, a mandibular spring retainer, a maxillary removable appliance, a fragment of a maxillary removable appliance, a piece of archwire, a fractured Twin-block appliance and accidental ingestion of a rapid palatal expander, a quad helix appliance, a component of a fixed orthodontic appliance, a gold cast crown during orthodontic tooth separation and presence of orthodontic archwire in the nasal cavity, orthodontic bracket lost in the airway during orthognathic surgery, dislodgement of an orthodontic bracket into a sagittal split site etc. Although in most cases these objects are excreted, in 1% of the cases, complex problems such as gastrointestinal perforation are seen, which can sometimes lead to serious risks, and death also. We can say that orthodontic treatment involves dangerous tools to be worked out, in a sensitive place like oral cavity, which is the entrance for respiratory and digestive systems. Prevention is the best method, but when happened, an efficient management of the event would become critical and so saving the patient's life is at greatest risk.

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INTRODUCTION

The incidence of aspiration or swallowing dental foreign bodies varies considerably in the literature and the incidence ranges between 3.6% to 27.7%. Broken orthodontic appliances, or components and dental instruments are the second most commonly ingested objects in adults (Naragond et al., 2013). Aspiration or ingestion of foreign objects is sometimes a serious medical issue that may require immediate hospitalization and sometimes may be fatal.

Foreign body inhalation and ingestion episodes are potential complications in all areas of dentistry because dentists commonly place patients in a supine position. The risk of objects entering the oropharynx is increased. The use of rubber dams and throat shield reduce the incidence of these adverse events (Bilder et al., 2011).

Ingestion of objects of orthodontic origin: Components of both removable and fixed appliance may be aspirated. There are literature reports of swallowing a transpalatal arch during its removal (Bilder et al., 2011), accidental swallowing of a quad helix during its removal,⁴ a mandibular spring retainer,⁵ a piece of archwire,⁶ accidental ingestion of molar band (Naragond et al., 2013), broken twin block appliance (<http://www.mayoclinic.com/health/first-aid-choking/FA00025>), a

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fragment of a maxillary removable appliance (Dibiase *et al.*, 2000) and keys of expansion appliance (Tripathi *et al.*, 2011). Oropharynx is the common site where the object can enter when patient is placed in a supine position (Tripathi *et al.*, 2011). The small size of orthodontic components in the presence of saliva and the limited access in the posterior segments may be the contributing factors for the adverse effects.¹¹ The risk after ingestion varies according to the shape, size, and flexibility of the object (Hoseini *et al.*, 2013). The aspiration or ingestion of orthodontic appliances is less common but no less varied in the types of appliance involved. These adverse effects commonly happen outside the orthodontic office because patients wear the fixed or removable orthodontic appliances continuously (Bilder *et al.*, 2011).

Symptoms and sites of ingestion: Esophageal obstruction – symptoms include inability to swallow, muscle incoordination, pain on swallowing, hematemesis, or vomiting, incessant twitching (Lee, 1992; Allwork *et al.*, 2007). Stomach – 80% to 90% chance of passing through the gut without any problem. Less than 1% causes a perforation. Symptoms include abdominal pain, fever, nausea, vomiting and abdominal distension (Lee, 1992; Allwork, 2007). Obstruction above vocal cords – acute respiratory distress. Obstruction in laryngotracheal region – symptoms include dyspnea, cough and stridor. Bronchial region – cough, decreased air entry, dyspnea, and wheezing. Obstruction of the larynx or trachea – hoarseness with or without cyanosis (Lee, 1992).

Management

Managing this emergency situation is very critical. Clinician should confirm the accidental ingestion by elucidating a proper history and symptoms.

-)] When an object is accidentally ingested, the head of the patient is turned to one side and encourage the object fall into cheek.
-)] Examine properly, if object is visible retrieve it using forceps or high volume suction.
-)] If not visible, in non critical cases – wait and watch. Object can be expelled of its own.
-)] If patient is symptomatic, appropriate radiographs should be taken to localize the object.
-)] For radiolucent objects, ingestion of cotton wool pellets mixed with small amounts of barium sulphate suspension forms a radio opaque bolus.
-)] If patient is in respiratory distress Heimlich maneuver can be performed.
-)] In critical situations, an emergency airway should be established by an expert.
-)] Endoscopy evaluation can be done.
-)] Surgical removal (Naragond *et al.*, 2013; Clark, 1988; Lee, 1992; Allwork *et al.*, 2007).

PREVENTION

-)] Use of throat shields while removing the orthodontic components.
-)] Dental floss can be tied to molar bands, expansion keys, transpalatal arches, quad-helices.
-)] Wax can be used to temporarily stabilize auxiliaries such as coil springs, on arch wires.

-)] Cotton roll can be placed over the end of arch wire before it is cut.
-)] High volume suction should be used.
-)] All metal retentive components and acrylic plates of removable appliance should be inspected regularly (Naragond *et al.*, 2013; Lee, 1992; Allwork, 2007; Clark, 1988).

Conclusion

Aforementioned situations are totally preventable. General dentists and orthodontists must be informed about precautionary measures and managing the cases. Chairside emergency equipments must be ready always. In critical situations, patient should be hospitalized and appropriate treatment should be given (Allwork, 2007; Clark, 1988).

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