

CASE REPORT Accidental Ingestion of a Rapid Palatal Expander

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Many kinds of iatrogenic damage during orthodontic treatment have been reported.¹⁻¹³ Among the most common is the accidental ingestion of retainers, sectional wires, partial dentures, rubber dam hooks, bands, brackets, or expansion appliance keys.¹⁴⁻¹⁷

The following case report describes the accidental swallowing of a rapid palatal expander by a young girl.

Case Report

A 9-year-old girl presented in our clinic with a skeletal Class I malocclusion, a unilateral crossbite on the left side, a functional shift of the mandible, and a mouthbreathing habit. She had a Class I molar and canine relationship on the right side, a Class II molar and canine relationship on the left, and a midline deviation.

A year earlier, the patient had begun orthodontic treatment to resolve the crossbite with a rapid palatal expander. Treatment was interrupted when the rapid palatal expander broke away from the two upper molar bands after sutural opening and was accidentally swallowed by the patient.

The girl was immediately referred to pediatric surgery, where radiographs were taken to determine the exact location of the expander¹⁸ (Fig. 1). The patient was then placed under general anesthesia to allow retrieval of the appliance with an endoscope.

Discussion

To our knowledge, there are no published case reports of accidental ingestion of a rapid palatal expander. Conventional soldering of the expansion screw to the molar and/or premolar bands creates weak points in the appliance that can lead to breakage. By contrast, a recently introduced laser soldering technique is fully autogenous, meaning no materials are added to the base material.¹⁹ Although this system makes it possible to fabricate more secure and biocompatible orthodontic appliances, it is not yet routinely used by orthodontic laboratories due to its high cost.

More than 2,700 Americans die each year from food or other objects lodging in the larynx; fortunately, however, once a foreign object passes the tongue, chances are better than 12 to 1 that it will settle in the gastrointestinal tract rather than the airway.²⁰ If a patient does accidentally swallow an orthodontic appliance, symptoms should be closely monitored.

Symptoms of tracheobronchial obstruction--dyspnea, coughing, or choking--may remit temporarily, but later develop serious consequences.²¹ In such cases, immediate removal is mandatory.

Symptoms of esophageal obstruction include inability to swallow, muscle incoordination, pain on swallowing, vomiting, and hematemesis. Anteroposterior and lateral radiographs can reveal whether the body is lodged in the trachea or the esophagus.¹⁸

If the appliance is in the gastrointestinal tract, the probability is better than 90% that it will pass uneventfully. A foreign body normally traverses the intestinal tract in one to 12 days, although it may take considerably longer. Therefore, if the appliance is small enough, it may be advisable to wait for two to 12 days to see if it will be naturally evacuated. Such patients should be advised to supplement their diet with a large amount of cellulose and to check their feces.

Impaction of large objects (such as a rapid palatal expander) or those with sharp edges can lead to ulcerations and perforations and therefore requires immediate surgical removal. The gastrointestinal tract is relatively easy to access with an endoscope. Because any surgery carries a 6% risk of complications, including death in rare cases,²² the retrieval operation should be performed by an experienced endoscopist. •

FIGURES



Fig. 1 Frontal view of abdomen showing rapid palatal expander in stomach.

REFERENCES

- 1 Behrents, R.G.: Iatrogenics in orthodontics, *Am. J. Orthod.* 110:235-238, 1996.
- 2 Sfondrini, G.; Fraticelli, D.; Sfondrini, M.F.; and Fiori, M.: Danno iatrogeno in ortognatodonzia: Rischi intraorali ed extraorali, *Dent. Cadmos* 66:47-53, 1998.
- 3 Burstone, C.J.: Basi razionali della biomeccanica ortodontica, in *Recenti Controversie in Ortodonzia*, ed. B. Melsen, *Scienza e Tecnica Dentistica*, Milano, 1991, pp. 139-155.
- 4 Melsen, B.: Limiti del trattamento ortodontico negli adulti, in *Recenti Controversie in Ortodonzia*, ed. B. Melsen, *Scienza e Tecnica Dentistica*, Milano, 1991, pp. 157-193.
- 5 Crain, G. and Sheridan, J.J.: Susceptibility to caries and periodontal disease after posterior air-rotor stripping, *J. Clin. Orthod.* 24:84-85, 1990.
- 6 Piacentini, C. and Sfondrini, G.: A scanning electron microscope comparison of enamel polishing methods after air rotor stripping, *Am. J. Orthod.* 109:57-63, 1996.
- 7 Calvi, D.; Cacciafesta, V.; Sfondrini, M.F.; and Sfondrini, G.: Decalcificazioni smaltie e fluoroprofilassi in ortognatodonzia: Revisione della letteratura, *Ortog. Ital.* 11:59-65, 2002.

- 8** Fitzpatrick, D.A. and Way, D.C.: The effects of wear, acid etching and bond removal on human enamel, *Am. J. Orthod.* 72:671-681, 1977.
- 9** Harris, E.F. and Baker, W.C.: Loss of root length and crestal bone height before and during treatment in adolescent and adult orthodontic patients, *Am. J. Orthod.* 98:463-469, 1990.
- 10** Seel, D.: Extra oral hazards of extra oral traction, *Br. J. Orthod.* 7:53, 1980.
- 11** Holland, G.N.; Wallace, D.A.; Mondino, B.J.; Cole, S.H.; and Ryan, S.J.: Severe ocular injuries from orthodontic headgear, *Arch. Ophthalmol.* 103:649-651, 1985.
- 12** Booth-Mason, S. and Birnie, D.: Penetrating eye injury from orthodontic headgear: A case report, *Eur. J. Orthod.* 10:111-114, 1988.
- 13** Dibiase, A.T.; Samuels, R.H.; Ozdiler, E.; Akcam, M.O.; and Turkkahraman, H.: Hazards of orthodontic appliances and the oropharynx, *J. Orthod.* 27:295-302, 2000.
- 14** Alexander, R.E. and Delhom, J.J.: Rubber dam clamp ingestion, an operative risk: Report of a case, *J. Am. Dent. Assoc.* 82:1387-1389, 1971.
- 15** Donaldson, D.; Eccles, C.N.; and Smith, G.A.: Partial dentures as a hazard to the airway: A case report, *Br. Dent. J.* 131:546-548, 1971.
- 16** Hinkle, F.G.: Ingested retainer: A case report, *Am. J. Orthod.* 92:46-49, 1987.
- 17** Nazif, M.M.; and Ready, M.A.: Accidental swallowing of orthodontic expansion appliance keys: Report of two cases, *ASDC J. Dent. Child.* 50:126-127, 1983.
- 18** Absi, E.G. and Buckley, J.G.: The location and tracking of swallowed dental appliances: The role of radiology, *Dentomaxillofac. Radiol.* 24:139-142, 1995.
- 19** Isaza Penco, S. and Ferrari, M.: La saldatura laser: Una risposta alle esigenze dell'ortodonzia moderna, *Mondo Ortod.* 25:275-286, 2000.
- 20** Clerf, L.H.: Historical aspects of foreign bodies in the air and food passages, *S. Med. J.* 68:1449-1454, 1975.
- 21** . Adelman, H.C.: Asphyxial deaths as a result of aspiration of dental appliances: report of three cases, *J. Forensic Sci.* 33:389-395, 1988.
- 22** Tamura, N.; Nakajima, T.; Matsumoto, S.; Ohyama, T.; and Ohashi, Y.: Foreign bodies of dental origin in the air and food passages, *Int. J. Oral Maxillofac. Surg.* 15:739-751, 1986.