SAGE Open Medical Case Reports
Volume 6: 1–4

DOI: 10.1177/2050313X18781229
journals.sagepub.com/home/sco
SAGE

An uncommon source for oesophageal foreign body: Fidget spinner

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Abstract

Fidget spinner is a new handheld toy with potential choking and ingestion hazard. Our objectives are to describe clinical presentation of a child with fidget spinner ingestion and draw attention to danger associated with fidget spinner. A 3-year-old boy presented with painful swallowing and feeling of something stuck in the throat. A chest radiograph revealed a radiopaque foreign body with a disc-like component. Rigid oesophagoscopy revealed a foreign object with disc battery and battery holder circuit board. Clinicians should consider the fidget spinner as one of many varieties of toys that has potential for button battery ingestion or aspiration.

Keywords

Fidget spinner, foreign body, oesophagus, circuit board, battery

Date received: 11 December 2017; accepted: 15 May 2018

Introduction

Foreign body (FB) ingestion in the upper aerodigestive tract remains a worldwide public health concern. American Poison Control Centres documented 68,371 FB ingestions under the age of 5 years in 2015.[1] Children 15 years old and below accounted for 70%–80% of patients with FB in the upper aerodigestive tract and the highest incidence of FB ingestion is in children between 6 months and 3 years.[2–5] The incidence of FB ingestion is equal in males and females. A wide variety of ingested objects, including but not limited to coin, disc battery, plastic, metal, toy, toy parts, magnets, safety pin, and screw, has been recovered in children.[2–5] While many oesophageal foreign bodies do not require emergent removal, a disc battery requires expedient removal due to the risk of serious risk and death. Early identification and management of disc battery ingestion is critical to prevent complications.

Fidget spinner only recently entered the market as a toy for children and adults. Fidget spinner is a handheld toy designed to spin freely with minimal effort. The multi-lobed portion of a fidget spinner may contain three lighted ends operated by a button battery attached to a circuit board. Adverse effects of fidget spinners such as distraction in classroom, social conflict among peers, and stress injury have been reported.[6] Fidget spinners are not subject to national safety regulation, and packages often do not include warning labels or parental advisory.[6] Hence, counselling parents about the hazards of fidget spinner is crucial in prevention of injury.

Fidget spinner may have lights, batteries, circuit boards, and magnets. Ingestion of battery and lights of a fidget spinner has been reported.[7–10] To date, ingestion of a fidget spinner's circuit board with a disc battery has not been documented as an oesophageal FB in children. We describe clinical presentation of a child with fidget spinner ingestion and draw attention to the danger associated with fidget spinner.

Case report

A 3-year-old boy presented to the emergency room with 2 h of pain with swallowing and feeling of something stuck in the throat. The patient reported swallowing a toy. No aspiration or placement of a FB was witnessed. Parents suspected that the child swallowed the lighted portion of a fidget

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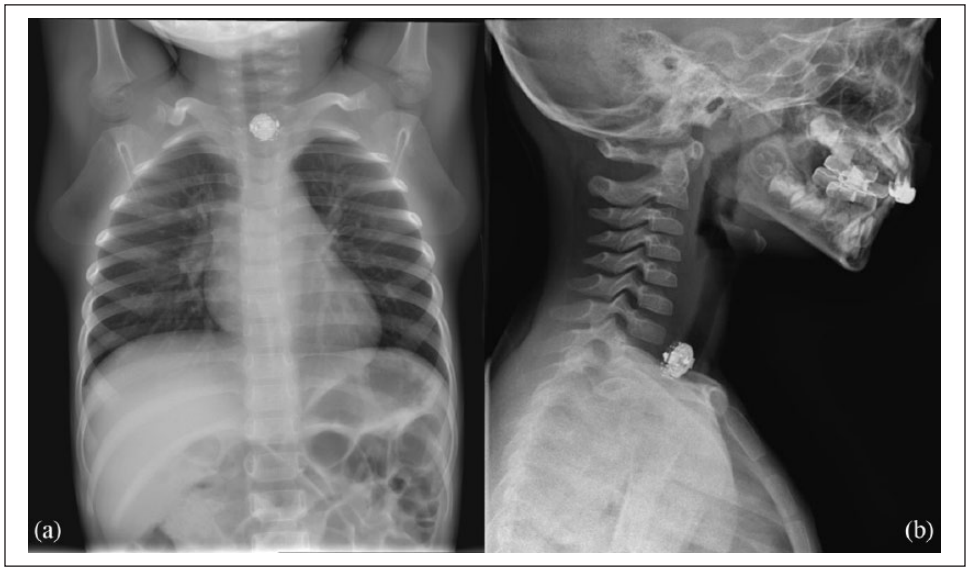

Figure 1. Chest radiographs obtained in (a) anterior–posterior and (b) lateral views revealed an oesophageal foreign body at the level of the thoracic inlet.

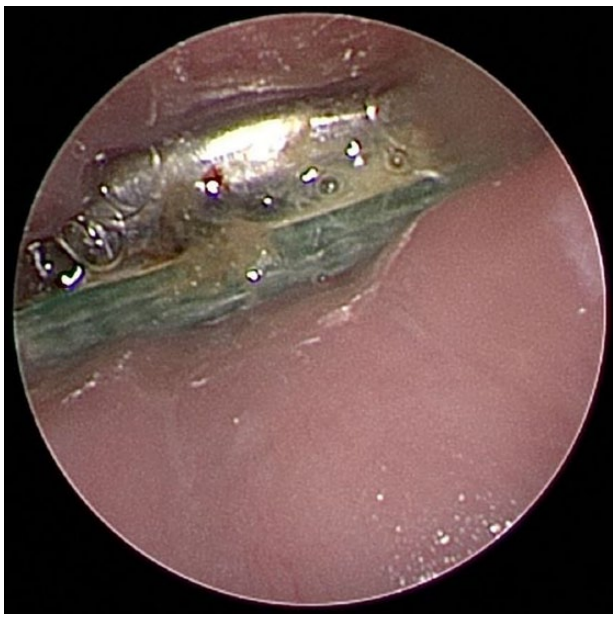

Figure 2. Rigid oesophagoscopy revealed an oesophageal foreign body with a green-coloured circuit board and disc battery. Edges of the circuit board were embedded in the oesophageal walls.

spinner. The birth history was unremarkable. Past medical history included asthma. Family history was unremarkable. At the time of presentation, physical examination revealed a well-appearing child with no drooling, no vomiting, no haematemesis, no hoarseness, no cough, and no respiratory distress. A chest radiograph revealed a radiopaque FB with a disc-like component with lucent rim, in keeping with a disc battery seen in the oesophagus at the level of the thoracic inlet (Figure 1). The object was ultimately removed using rigid oesophagoscopy in the operating room. At the time of rigid oesophagoscopy, oesophageal mucosa was with oedema and hyperaemia (Figure 2). The foreign object had a battery and battery holder circuit board (Figure 3). Total button battery exposure time was 4 h. The patient was discharged home on hospital day 1.

Discussion

Original fidget spinner design has been modified to include lights, batteries, circuit boards, and magnets. Recent studies documented oesophageal or gastric injury due to ingestion of fidget spinner's battery, light, metal disc, and magnet.[7–10] To our knowledge, this study is the first to report fidget spinner as a source for circuit board and disc battery ingestion. Furthermore, ingestion of a circuit board with an attached button battery has not been documented in children. A chest radiograph was useful to identify the disc battery associated with circuit board. Disc battery has a distinctive radiologic appearance with a double-density shadow in an anterior view and step-off at the junction of the cathode and anode in a lateral view. Early identification of disc battery is essential for planning the management of oesophageal FB as the incidence of major complications from oesophageal foreign bodies is 6.7-fold higher when a battery is involved.[11]

Disc battery has a potential to cause significant oesophageal injury within 2 h.[12] The electrical current from the disc battery generates hydroxide alkaline injury when the disc battery comes in contact with oesophageal mucosa. Full-thickness oesophageal injury may cause oesophageal perforation, mediastinitis, tracheoesophageal fistula, or life-threatening haemorrhage due to erosion of adjacent vascular structures. Characteristics of the epithelial injury such as circumferential or partial thickness mucosal lesion raise

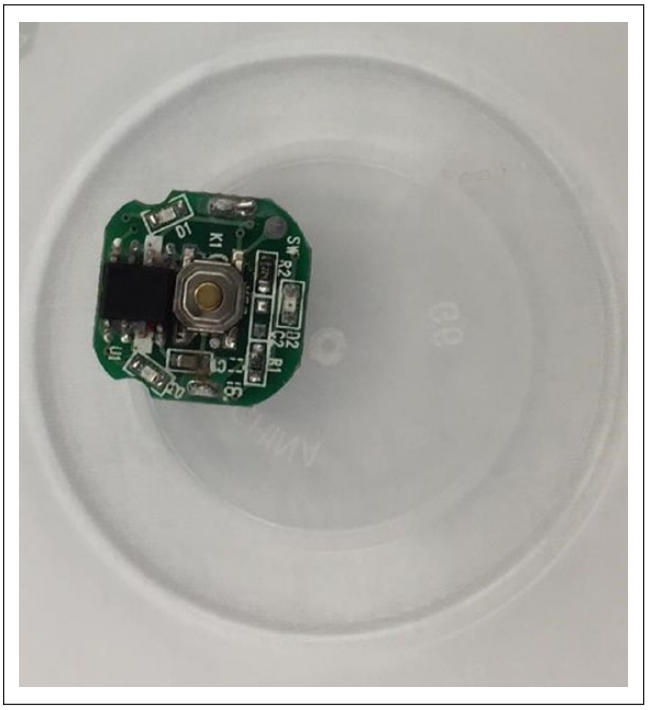

Figure 3. Picture of foreign body showing the fidget spinner's circuit board with metallic components and sharp edges.

concern for delayed complications. The lack of visual evidence of extensive injury at the time of removal does not rule out potential future injury.[13] Therefore, a repeat oesophagoscopy is recommended for disc battery impaction duration greater than 2–3 h, an impacted battery located close to the aorta, a battery with greater than 1.5 V, or concern for heavy metal or lithium toxicity.[14] A long-term sequelae of the ingested disc battery was not seen in our patient due to short duration of exposure to disc battery.

In this study, ingestion of the circuit board posed potential injury to the oesophageal mucosa. Circuit board included metallic components and sharp edges which increase the risk of oesophageal perforation during removal. To date, ingestion of a circuit board has not been reported in children. Removal of computer circuit board required thoracotomy, oesophagotomy, and primary oesophageal closure with intercostal muscle flap in an adult.[15]

As new toys are introduced, the risk of ingestion and aspiration must be critically assessed to prevent these events and the associated complications. Parents and providers must be cognizant of the risks of everyday objects. Small toys that have capacity for light should be critically assessed by manufacturers, parents, and providers as a potential source for sharp and corrosive FB ingestion. While no other reports of fidget spinner ingestion are in the literature, this report serves as an example of the risks of small battery-powered toys, especially to a paediatric population at risk of FB ingestion or aspiration.

Conclusion

Clinicians should consider the fidget spinner as one of many varieties of toys that has potential for circuit board and disc battery ingestion or aspiration.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval

Ethical approval to report this case was obtained from University of Texas Southwestern Medical Centre, Institutional Review Board (STU 022016-085).

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Informed consent

Written informed consent was obtained from the patient's father for the anonymized information to be published in this article.

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