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Original Article

Dentistry Section

Foreign Body Aspiration in Paediatric Dental Practice: A Systematic Review

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ABSTRACT

Introduction: Foreign Body Aspiration (FBA) is an acute event with a clinical presentation ranging from severe respiratory distress to minimal symptoms, and it may lead to life-threatening conditions. Foreign objects can vary significantly in shape and size and can become lodged in the gastrointestinal or respiratory tract.

Aim: To review the available literature regarding the diagnostic methods, complications, and management strategies of FBA in paediatric dentistry.

Materials and Methods: In the present systematic review, case reports and series on FBA in paediatric dental practice published until December 2023 were searched in various databases (PubMed, Scopus, and Google Scholar). Based on the inclusion criteria, 25 studies were selected, and symptoms, complications, anatomical locations, spontaneous passage, and management of these cases were assessed. The risk of bias was evaluated for the included articles using the Joanna Briggs Institute (JBI) critical appraisal checklist for case reports.

Results: Out of the 25 studies, seven focused on aspiration and 18 on ingestion. Endodontic files were the most commonly aspirated and ingested foreign bodies. Aspiration or ingestion of burs, dental crowns, arch wires, orthodontic brackets, teeth, dental retainers, or clamps was also reported. Objects located in the stomach and intestines were more commonly passed spontaneously than those at any other site in the gastrointestinal system. Complications such as pleural effusion, lung abscess, or gastric ulcers were frequently reported when sharp-edged objects were involved, and these were managed through endoscopy followed by bronchoscopy.

Conclusion: Based on the review of cases, endoscopy was the most commonly used technique for removing foreign bodies, with high success rates. Standard patient safety protocols, such as using a rubber dam, gauze, throat screen, and attaching dental floss to dental crowns, rubber dam clamps, and hand files, are recommended to prevent aspiration or ingestion of foreign bodies.

Keywords: Airway obstruction, Bronchoscopy, Children, Dental materials, Endoscopy

INTRODUCTION

Foreign Body Aspiration (FBA) refers to the introduction of solid matter into the airway at the level of the glottal opening, larynx, trachea, or bronchi, which can manifest as difficulty breathing or choking [1]. FBA is a prevalent issue in paediatric populations, with up to 75% of cases occurring in children under four years of age [2]. The increased risk of FBA in children is due to anatomical differences in the pharynx and upper respiratory tract, as well as an immature swallowing mechanism compared to adults [3].

FBA typically presents as an acute event with a wide range of clinical symptoms, from severe respiratory distress to minimal or non specific signs. Foreign objects of various shapes and sizes can lodge in the gastrointestinal or respiratory tract, some posing greater risks and being more life-threatening than others [4]. The presence of body fluids, such as blood and saliva in the oral cavity, increases the likelihood of dental instruments slipping and causing FBA [5,6]. Clinicians must remain vigilant and act swiftly to recognize the signs and symptoms of airway obstruction to provide immediate and appropriate treatment until emergency support is available [7].

Reports of dental FBA in children date back to as early as the 19th century [8]. However, many incidents may have gone unreported, resulting in limited and less comprehensive available literature. Due to the sparse information on dental FBA, this systematic review aims to highlight the diagnostic methods, complications, and management strategies of FBA in paediatric dentistry.

MATERIALS AND METHODS

This systematic review integrates and analyses case reports and series on FBA and ingestion in paediatric dental practice. The study protocol was registered with the International Prospective Register of Systematic Reviews (PROSPERO) prior to conducting the review (registration number: CRD42022348340) and adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

Search strategy: A systematic search of the databases PubMed, Scopus, and Google Scholar was conducted for the literature survey. The search terms were a combination of the keywords (foreign body, aspiration, paediatric dentistry, ingestion, complications). Studies published until December 2023 in the English language were included, and the search was performed by six researchers.

Study selection: Study selection was based on the PICOS questions, which included: (Population) children undergoing dental treatment or procedures; (Intervention) dental procedures where FBA risk exists; (Comparison and Outcome) consequences of dental FBA and ingestion, including complications and management strategies; (Study design) case reports and case series.

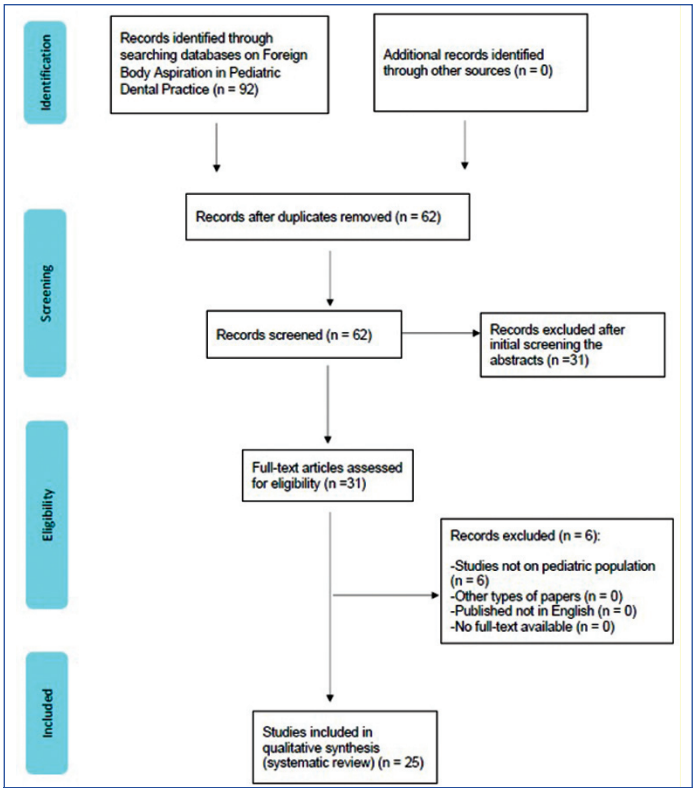
Inclusion and Exclusion criteria: The current review included studies that met the following inclusion criteria:

- cases specifically related to aspiration and ingestion of foreign bodies in paediatric dental practice; and
- studies that assessed presenting symptoms, complications, anatomical locations, spontaneous passage, and management.

Studies conducted on adults and animals, unpublished data, and studies published in languages other than English were excluded [Table/Fig-1].

Data Extraction and Analysis

The original titles and abstract texts of the papers were reviewed. Data extraction was performed using a standardised data extraction form that collected information on the journal name, publication year, study design, total sample size, population type, country, age



[Table/Fig-1]: Preferred reporting items for systematic review and meta-analysis flowchart.

range, location of foreign body impaction, presenting symptoms, complications, spontaneous passage rates, removal methods, and outcomes. Two researchers independently extracted the data. If there was a discrepancy, the original text was reviewed to reach a consensus. The nature of case reports, such as the heterogeneity of study design, the health status of participants, specific interventions and testing procedures, and outcome variables, made meta-analysis impossible. Descriptive data on the consequences and management of dental FBA were extracted.

Outcomes assessed: The primary objective was to evaluate the consequences of dental FBA and ingestion in children. Secondary objectives included identifying management strategies and providing recommendations for handling such incidents.

Evaluating the risk of bias: The JBI critical appraisal checklist for case reports was used to perform a quality check on the systematic review of case reports [9].The quality was judged sufficient if five out of the eight evaluation criteria were met [9]. All researchers agreed on the studies that were searched.

RESULTS

A total of 25 studies [6,8,10-32] were selected for the current systematic review, of which seven studies [8,10-15] focused on foreign body aspiration (FBA) [Table/Fig-2], and 18 studies [6,16-32] were related to foreign body ingestion [Table/Fig-3]. The total number of cases reported was seven for aspiration [8,10-15] and 24 cases [6,16-32] for ingestion. Among these, six reports [6,10,11,16,21,30] involved children with special healthcare needs.

Of the 25 studies, nine were from India [6,10,18,19,21,23,25-27], six were from the USA [13-15,30-32], two were from Brazil [20,28], and there was one each from the UK [8,29], Turkey [12], Portugal [24], Ireland [22], France [11], Nepal [16], and Saudi Arabia [17]. The oldest study was reported in 1918 [8], while the most recent study was published in 2022 [16,17]. The age of the population ranged from three years to 17 years, with 18 males and 13 females.

The risk of bias was assessed for the included articles using the JBI critical appraisal checklist for case reports [9]. All 25 studies [6,8,10-32] received a score above five out of eight; hence, the quality was judged to be satisfactory/sufficient [Table/Fig-4] [6,8-32].

DISCUSSION

Foreign body lodgement can be categorised into aspiration or ingestion based on the anatomical location of the object. Foreign Body Aspiration (FBA) includes objects retrieved from the trachea, bronchus, larynx, hypopharynx, and lower lungs, whereas ingestion involves objects removed from the oesophagus, stomach, bowel, and rectum [33].

In dental practice, FBA can be life-threatening, particularly in young children. The incidence is twice as high in males compared to females [34]. Due to limited cooperation and the presence of saliva in the oral cavity, aspiration of dental materials or small instruments can lead to serious complications during dental procedures. Any object routinely placed into or removed from the oral cavity during dental or surgical procedures may be aspirated or swallowed [35]. Children's airways are immature, narrower, more flexible, and funnel-shaped compared to adults, with the larynx positioned more antero-superiorly and the trachea being more flexible, increasing the likelihood of airway collapse during FBA [36]. Furthermore, children with special healthcare needs may have comorbidities such as decreased muscle tone, increased salivation, and sudden uncontrolled movements, which further elevate the risk of FBA or ingestion [37]. The degree of airway obstruction depends largely on the path and site of lodgement of the object [38].

When the aspirated or ingested foreign object is larger than 5 cm or has a pointed form, the risk of injury increases, potentially causing damage to the gastric mucosa, leading to septic abscesses, intestinal perforation, partial or complete airway obstruction, post-obstructive pneumonia, respiratory distress, pneumothorax, or haemorrhage. These complications can be life-threatening if not managed appropriately and promptly [4].

The purpose of this systematic review was to compile available data from case reports and series to highlight the consequences and management of dental foreign body aspiration (FBA) in children. The most commonly aspirated foreign bodies in the reviewed studies were endodontic files [10,18,21,23,24,26,32], extracted teeth [6,8,11,12], crowns (stainless steel and zirconia) [13,17,19], orthodontic brackets [24,29], irrigation needles [20], arch wires [22], sectional wires [29], surgical blades [24], dental burs [16,25], airotor caps [25], gauze pieces [15], appliance fragments [27], activation keys [28], rubber tubing from mouth props [30], and rubber dam clamps [31].

The most common sites of foreign body lodgement were the abdomen, followed by the bronchus, large intestine, and lungs, with other sites including the small intestine, oesophagus, and thorax. Complications reported in the included cases included the presence of purulent material in the bronchus [12], lung abscesses [8,14], pleural effusion [14], gastric and duodenal ulcers [24], pulmonary infections [11], postoperative pyrexia, air trapping, and hyperinflation of the lungs [22].

FBA is an emergency in both paediatric dental practices and hospital settings and requires prompt diagnosis and management. Although the focus of this systematic review was on FBA, some studies included more cases of foreign body ingestion than expected.

In most cases, foreign bodies pass through the digestive system without complications. However, non-surgical intervention is required in 10-20% of cases, while surgical intervention is necessary in less than 1% [4]. In this review, the management of ingested foreign bodies predominantly involved a conservative approach, such as observation and the recommendation of a fiber-rich diet. This approach led to the spontaneous passage of the object within a time frame ranging from 26 hours to six days post-ingestion.

In cases where spontaneous passage was not possible, interventions like endoscopy were performed to retrieve objects such as dental retainers [14], stainless steel crowns [13], and

endodontic files [18,24,26]. Endoscopy was also used for ingested fragments of myofunctional appliances [27], orthodontic brackets, and wires [22,24].Aspiration cases were managed using bronchoscopy [10,13,14], thoracotomy [8,12], or the finger sweep method [15].

For a dental object that has slipped into the patient's oropharynx, the reverse Trendelenburg position (raising the upper part of the body 20°-30°) followed by coughing is recommended. The Heimlich maneuver should be performed if the object cannot be retrieved, and the patient should be immediately taken to the nearest emergency

S. No	Author Details	Age/ Gender	Type of Study	No of cases	Foreign body	Symptoms	Complications	Investigation/ Diagnosis	Site of lodgement	Spontaneous passage	Management	Recommendation
1.	Mahesh R et al., 2020 India [10]	8/M (ADHD)	Case report	1	Endodontic instrument (Pro Taper hand file)	Choking and cough	-	PA radiograph	T4 vertebral body	-	Bronchoscopy	Proper isolation techniques necessary
2.	Canceill T et al., 2019 France [11]	4/M (Downs synd-rome)	Case report	1	Maxillary incisor during extraction	-	Pulmonary infection 3 weeks later	Chest X-ray	Left lung	-	Endoscopy	Follow guidelines
3.	Ulku R et al., 2015 Turkey [12]	8/M	Case report	1	Tooth	Febrile, Tachypnic, Tachycardia, O2 sat - 85%, Elevated WBC count	Purulent material in bronchus intermedius	Rigid bronchoscopy under conscious sedation	Bronchus Intermedius	-	Right lateral thoracotomy (2nd attempt)	-
4.	Adewumi A and Kays DW 2008 USA [13]	5/M	Case report	1	Stainless steel crown	Choking, coughing, wheezing	-	Chest Radiograph	Right main stem bronchus	-	Diagnostic laryngoscopy and Rigid Bronchoscopy and removal under GA	Placed and removed rubber dam. (During mid OP)
5.	Klein AM and Schoem SR 2002, USA [14]	15/M	Case report	1	Dental Retainer	Fever, Dry cough, Chest pain. Weight Loss	Left lower lobe abscess & Pleural effusion	Chest Radiograph and CT	Left main stem bronchus	-	Rigid Bronchoscopy and removal	-
6.	Villasenor A 1999, USA [15]	10/M (micro-cephaly)	Case report	1	Cotton gauze piece	Asphyxia	-	-	-	-	Manual finger sweep	Postoperative instructions following a dental extraction
7.	Thomson 1918, UK [8]	10/F	Case report	1	Tooth	Wheezing, ronchi over left lung	Abscess	Chest radiograph	Secondary bronchus of left lung	-	Removed by thoracotomy under GA	(1) Do not reach for the foreign body with the finger, lest the foreign body be thereby pushed into the larynx, or the larynx be thus traumatized. (2) Do not make any attempt at removal with the patient in any other position than recumbent, with the head and shoulders lower than the body. (3) Do not hold up the patient by the heels, lest theforeign body bedislodged and asphyxiate the patient by becoming jammed in the glottis. (4) Do not fail to have a radiograph made, if possible, whether the foreign body in question is of the kind dense to' the ray or not. (5) Do not fail endoscopically to search for a foreign body in all cases of doubt. (6) Do not pass an oesophageal bougie, probing, or another instrument blindly. (7) Do not tell the patient he has no foreign body until after a radiography, physical examination, indirect examination, and endoscopy have all proven negative

[Table/Fig-2]: Foreign Body Aspiration (FBA) studies included [8,10-15].

S. No	Author/year/ country	Age/gender	Study type	Sample size	Foreign body ingested	Symptoms	Complications	Diagnosis	Anatomical location	Spontaneous passage	Management	Recommendations
1.	Khadka S et al 2022 Nepal [16]	3/M	Case report	1	Daimond round Dental bur	-	-	PA x-ray of chest and abdomen	Gastro-intestinal tract	Yes	Observation, Monitoring and Fibre rich diet	Use of rubber dam, gauze throat screen, tying of floss ligature on rubber dam clamps, hand files, crowns, elastic separators, space maintainer equipments, with proper inspection of instrument locking in handpieces and utilizing high evacuation suction are some of the methods to avoid accidental instrument or material ingestion side.
2	Yazeed M. Almuaytiqc Saudi 2022 [17]	5/M	Case report	1	Stainless steel crown	-	-	PA x-ray of the abdomen	Gastro-intestinal tract	Yes	Observation, Monitoring and Fibre rich diet	To avoid such instances in the dental operatory, use a rubber dam, attach dental floss to a stainless steel crown, place a gauge on the tongue, and slightly bend the child's head on the crown placement
3.	Nabeeh PK et al, 2020, India [18]	4/M	Case report	1	Endodontic instrument (Pro Taper hand file)	-	-	Head & neck radiograph. anterioposterior abdomen radiograph	left wall of fundus of the stomach	-	Endoscopy	Standard protocols of patient safety has to be followed; patient has to be shifted to the higher centers immediately for comprehensive emergency management.
4	Shah UI & Bhatiia R, 2018, India [19]	4/F	Case report	1	Zirconia crown	Asymptomatic	-	(PA abdomen and neck radiograph)	L4, L5 level in Abdomen	Yes	Observation, Monitoring and Fibre rich diet	No Rubber dam.
5	Asmarz HY et al, 2018, Brazil [20]	5/M	Case report	1	Curved irrigation needle	Non symptomatic	nil	Chest and abdominal radiograph	oropharynx	yes	Observation	Rubber dam should be used
6	Dandekar N 2017, India [21]	9/F(MR)	Case report	1	Protaper hand file	-	-	postero-anterior abdomen radiograph	level of L4-L5	Yes	-	Use of rubber dam
7	Puryer J et al, 2016, Ireland [22]	14/F	Case report	1	Ni-Ti maxillary archwire(1 cm)	-	postoperative pyrexia and post-instrumentation discomfort	Radiographs	oro-pharyngeal region/ right piriform recess	3.5 days	Endoscopy (failed); Observation	
8	Roopa K et al 2015 India [6]	10/F (CP)		1	Tooth	-	-	chest, PA radiograph	Large intestine	4th day	Observation	Need of educating the caregivers regarding dental trauma in patients with CP.
9	Bondarde P et al 2014, India [23]	4/M	Case report	1	Endodontic file	nil	nil	PA chest radiograph	stomach	yes	observation	Rubber dam isolation, floss should be tied to the tied
10	Cotrim J et al, 2014, Portugal [24]	17/M	Case series	3	Bracket ingestion	Abdominal pain	Gastric mucosa ulceration	Chest and Abdominal radiograph and Endoscopy	Gastric antrum mucosa	-	Removed using endoscopy	
		13/F			Dental file	-	Duodenal mucosa ulceration	Abdominal CT scan	Proximal jejunum/distal duodenum	-	Balloon endoscopy	
		15/M			Surgical blade	-		Abdominal radiograph	Proximal small intestine	Yes (On follow up)		
11	Panse A et al 2012, India [25]	4/M 6/M 12/F	Case series	3	Airotor bur Micromotor bur Airoter cap	nil	nil	PA radiograph of chest and abdomen	Gastrointestinal tract	Yes	Observation	Fibre rich foods, work in dry environment

12	Bhatnagar 2011, India [26]	13/F	Case report	1	Endodontic file	Nil	Nil	Postero-anterior radiograph of abdomen	pyloric region at the level of T 11 vertebral body	-	It was decided to do an oesophagogastroscopy to retrieve the file. The patient was kept nil by the mouth with regular observation and was taken under general anaesthesia and file was removed from gastric region by endoscopic-guided forceps	Use rubber dams routinely instead of cotton roll isolation to prevent the patient from aspirating or ingesting dental foreign objects. Using a gauze throat screen to catch objects before they fall into the patient's posterior pharynx is another method of preventing aspiration or ingestion in cases in which a rubber dam is not warranted. Tethering small instruments or clasps with floss is yet another way to prevent aspiration or ingestion of foreign objects.
13	Rohida NS, Bhad WA 2009 India [27]	12/ male	Case report	1	Twin block appliance fragment	breathless with a severe cough	nil	endoscopy	oesophagus	-	-	ill-fitting, or broken fragments of any appliance, and they should stop using them and contact the orthodontist's office
14	da costa Monini A et al 2009, Brazil [28]	9/M	Case report	1	Appliance key	nil	nil	Frontal Xray of abdomen	stomach	yes	observation	Use dental floss, controlled swallowing reflex
15	Milton TM et al 2001 [29] UK	14/F	Case series	Orthodontic bracket	-	-	PA abdominal radiograph	Large bowel	-	Observation		
		13/F		Arch wire 20 mm long	-	-	PA abdominal +chest radiograph	Stomach	-	Observation		
		15/M	3	Sectional wire	-	-	PA abdomen	Large intestine	-	Observation		
16	Wandera A et al 1993 [30] USA	4.2/F Spastic Quadriparesis	Case report	1	Rubber tubing of mouth prop	Within 20-30 sec the patient showed signs of respiratory distress and her complexion changed to an ashen color.	-	PA Chest and abdomen	Stomach	Yes	Two days later, spontaneous vomiting occurred and the tubing was found in emesis.	• Mouth props should be used judiciously. • Operators may defer responsibility for insertion, control, and removal to an assistant. • The prop should be positioned correctly in mouth • The fit over the metal arm should be tight and the rubber should extend over the extraoral parts to the pivot joint. • Rubber sleeves deteriorate with repeated sterilization. • They should be checked frequently and replaced when necessary. • For short examinations or procedures, tongue blades taped together provide a useful alternative.
17	Alexander RE et al 1971 [31] USA	6/F	Case report	1	Rubber dam clamp	-	slight abrasion noted in the oesophageal lining.	PA abdomen and chest	Against the posterior wall of the oesophagus, about 2 to 3 cm below the cricopharyngeus muscle (inferior constrictor of the pharynx).		General anesthesia clamp was seen, it was grasped with a forceps, and then the esophagoscope and forceps with the clamp were removed simultaneously	
18	Christen AG 1967 [32] USA	14/F	Case report	1	Endodontic file	Pre-umbilical discomfort in the form of mild, intermittent abdominal cramping	-	PA chest, kidney, ureter, and bladder films	Antrum of stomach	Yes	Spontaneous passage after 1 week	Rubber dam placement

[Table/Fig-3]: Foreign body ingestion studies included [6,16-32].

Studies	Were the patient's demographic characteristics clearly described?	Was there clear reporting of clinical information of the participants?	Were diagnostic tests or assessment methods and the results clearly described?	Was the intervention(s) or treatment procedure(s) clearly described?	Was the post-intervention clinical condition clearly described?	Were adverse events (harms) or unanticipated events identified and described?	Were the follow-up results of cases reported?	Does the case report provide takeaway lessons?
Roopa K et al., [6]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Thomson S [8]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mahesh R et al., [10]	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Canceill T et al., [11]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ulku R et al., [12]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adewumi A et al., [13]	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Klein AM and Schoem SR [14]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Villasenor A [15]	Yes	Yes	No	Yes	No	Yes	No	Yes
Khadka S et al., [16]	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Almuaytiqc YM et al., [17]	Yes	Yes	Yes	Yes	Yes	No	No	No
Nabeeh PK et al., [18]	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Shah UI and Bhatiia R [19]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Asmarz HY et al., [20]	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Dandekar N [21]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Puryer J et al., [22]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Bondarde P et al., [23]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cotrim J et al., [24]	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Panse A et al., [25]	Yes	Yes	Yes	Yes	No	Yes	Yes	yes
Bhatnagar S et al., [26]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rohida NS and Bhad WA [27]	Yes	Yes	Yes	Yes	No	Yes	No	Yes
da costa Monini et al., [28]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Milton TM et al., [29]	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Wandera A et al., [30]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Alexander RE et al., [31]	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Christen AG [32]	Yes	Yes	Yes	Yes	No	No	Yes	Yes

[Table/Fig-4]: Risk of bias for the included articles assessed using the Joanna Briggs Institute (JBI) critical appraisal checklist for case reports [6,8,10-32].

room if relief is not achieved. If the patient exhibits no symptoms, it is important to reassure and calm them while stressing the urgent need for a medical examination. The nature of the object-whether ingested or aspirated-can be confirmed through frontal and lateral chest and abdominal radiographs [37].

Complications related to foreign body aspiration (FBA) and ingestion can be minimised by using rubber dams during routine procedures and placing a throat pack during sedation. Endodontic instruments should be secured with dental floss, and periodic quality checks of the instruments used in the operatory are essential. Postoperative parental instructions should emphasize the risk of aspiration or ingestion of objects such as gauze, appliance fragments, and activation keys [37].

A retrospective study by Huh J et al., found that FBA occurs more frequently when procedures are performed by unskilled practitioners. In contrast, FBA and ingestion were more common in adults and rare in children, largely because rubber dams were strictly used in all applicable treatments. Small objects should be handled carefully within the oral cavity. During the extraction of deciduous teeth, it is advisable to use tight gloves, avoid reclining the chair too far (keeping it in a semi-supine position), and practice four-handed dentistry. Before using any instrument in the oral cavity, clinicians should check the connections of devices with detachable parts, such as dental mirrors and airotor burs [39]. The efficacy of treatment and its outcomes are closely related, as managin potential risk factors improves patient safety. By adhering to essential standards and procedures for patient safety, dental professionals are also better protected legally [40].

The results point to a pressing need for paediatric dentists to prioritize patient safety by adopting stringent preventive measures, such as using rubber dams, high-suction evacuation, and educating parents about potential risks during and after dental procedures. Additionally, integrating FBA training into dental education and fostering collaboration between paediatricians and dentists could enhance the early detection and management of aspirated foreign bodies.

Limitation(s)

The present systematic review faced several limitations. First, the absence of Randomised Controlled Trials (RCTs) weakens the strength of the evidence. Many studies focus on children treated in tertiary care centers, introducing population-specific bias and limiting generalizability to other settings, such as rural or primary care environments. As severe cases are more likely to be reported, publication bias may also arise, potentially skewing the data. Inconsistent outcome reporting and a lack of standardised diagnostic protocols for dental-related FBA further hinder the analysis. Additionally, limited access to gray literature and language restrictions affects the comprehensiveness of the review. Finally, the wide age range in paediatric studies-spanning from infants to adolescents-can introduce variability in aspiration risks, anatomical differences, and management approaches.

CONCLUSION(S)

This systematic review highlights the importance of recognising FBA as a significant, though underreported, issue in paediatric dentistry. Proper risk assessment, preventive strategies, and timely management are key to reducing morbidity and mortality. Future research should focus on developing standardised diagnostic and management protocols, exploring innovative dental tools, and enhancing training for dental professionals to improve preparedness for FBA emergencies.

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