

# Clinical Research Progress of Foreign Bodies in Digestive Tract

Dao-Hui Wei<sup>1, 2, 3</sup>, Wei Liu<sup>1, 2, 3\*</sup>

<sup>1</sup>The First College of Clinical Medical Science, China Three Gorges University, Yichang, China.

<sup>2</sup>Institute of Digestive Disease, China Three Gorges University, Yichang, China.

<sup>3</sup>Department of Gastroenterology, Yichang Central People's Hospital, Yichang, China.

**\*Corresponding Author:** Wei Liu. Institute of Digestive Disease, China Three Gorges University, 8 Daxue Road, Yichang 443000, China.

**Received date:** March 02, 2022; **Accepted date:** May 07, 2022; **Published date:** May 12, 2022

**Citation:** Dao-Hui Wei, Wei Liu. (2022) Clinical Research Progress of Foreign Bodies in Digestive Tract. *Clinical Research and Clinical Trials*. 6(1); DOI: [10.31579/2693-4779/093](https://doi.org/10.31579/2693-4779/093)

**Copyright:** © 2022 Wei Liu. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

## Abstract

Foreign body of digestive tract refers to the noninherent substances retained in the digestive tract caused by various reasons. Foreign body incarceration is one of the clinical emergencies, occurs at all ages, whose incidence is second only to gastrointestinal bleeding, accounting for about 4% of emergency endoscopic diagnosis and treatment. If not treated timely, foreign body incarceration may cause gastrointestinal erosion, ulcer, bleeding, perforation, obstruction and aortic rupture which is life-threatening. According to the characteristics of patients, dietetical characteristic, types of gastrointestinal foreign bodies, retention time of foreign bodies, incarcerated sites, clinical manifestations, complications, treatment methods, average length of stay and expenses, we explore the research progress of gastrointestinal foreign bodies to improve the level of diagnosis and treatment, as well as increase the cure rate and reduce complications. This review aims to summarize the clinical diagnosis and treatment methods of gastrointestinal foreign bodies for clinicians and strengthen readers' understanding of gastrointestinal foreign bodies.

**Key words:** gastrointestinal foreign bodies; endoscopy; clinical features; standardized diagnosis and treatment

## Introduction

There are many kinds of foreign bodies in the digestive tract with the diversification of recipes in today's society. The symptoms of patients are different due to age and the characteristics of foreign bodies, including dysphagia, swallowing pain, nausea, vomiting, salivation, abdominal pain and gastrointestinal bleeding [1, 2]. Children often incarcerate blunt foreign bodies, and their clinical manifestations are not obvious. Teenagers and the elderly often incarcerate sharp and slender foreign bodies, and their subjective symptoms are serious [3, 4]. If the foreign body is embedded in the esophagus, esophagogenic chest pain may occur. If the foreign body stays for a long time or is not treated properly, it can lead to serious complications such as gastrointestinal bleeding, perforation, esophageal mediastinal leakage and aortic rupture [5]. As the most common incarcerated site of foreign bodies in the digestive tract, the esophagus is often incarcerated in the upper part of the esophagus in children, while teenagers and the elderly are often incarcerated in the middle and upper part of the esophagus. Clinically, the patient has incarceration of foreign bodies in the digestive tract. If it cannot be eliminated by itself, he should seek medical treatment immediately [3]. Incarceration of sharp and slender foreign bodies (>5cm) is easy to cause serious complications such as gastrointestinal injury, bleeding and

perforation [6]. The retention time of foreign bodies is closely related to complications. The longer the retention time of foreign bodies, the lower the cure rate and the higher the incidence of serious complications. The preferred treatment for gastrointestinal foreign bodies is endoscopy [7, 8]. For high-risk foreign bodies (sharp foreign bodies and slender foreign bodies), emergency endoscopic treatment is recommended within 2 hours, preferably no more than 6 hours [3]. Low risk foreign bodies can be treated with early endoscopy within 24 hours [9, 10]. This review aims to summarize the clinical diagnosis and treatment methods of gastrointestinal foreign bodies for clinicians.

## Anatomical characteristics of digestive tract

The digestive tract is a muscular duct from the mouth to the anal canal, mainly including the mouth, pharynx, esophagus, stomach, small intestine, colon, rectum and anal canal. The incarcerated sites of foreign bodies in the digestive tract include: physiological or pathological stenosis of the digestive tract, intestinal stenosis [11] and corner of the digestive tract. The esophagus has three physiological stenosis areas. The first stenosis is located at the beginning of the esophagus, the second stenosis is located at the bifurcation of the aortic arch and trachea, and the third stenosis is located at the place where the esophagus passes through the diaphragm hiatus. Therefore, foreign bodies in the digestive tract are

easy to be embedded in three areas of physiological esophageal stenosis. Pylorus is the outlet of the lower end of the stomach moving to the duodenum, surrounded by thick circular muscles. It is one of the narrow parts of the digestive tract [3]. Foreign bodies are easy to be incarcerated here and can lead to perforation or obstruction [12]. In addition, there is an acute angle between the duodenal bulb and the descending part, and the descending part and the transverse part are connected at right angles. Foreign bodies with a length of more than 6 cm are easy to be embedded in these parts [10, 13]. Ileocecal part is the part where the end of ileum and cecum connect with each other. Ileocecal valve has the function of sphincter. This is the prone part of foreign body incarceration in lower gastrointestinal tract. As the last checkpoint for foreign bodies to pass through the digestive tract, the rectum has two bends and three lateral bends. Slender foreign bodies are easy to be embedded here [3]. Totally, foreign bodies in the digestive tract are often embedded in the upper segment of the esophagus [12], followed by the middle and lower segments of the esophagus, pylorus, duodenum, ileocecal part and rectum [14, 15]. However, it is also reported that 80% of foreign bodies in the digestive tract can pass through the gastrointestinal tract by themselves [16], and only a few foreign bodies are embedded in the ileocecal part and rectum.

### Epidemiological characteristics of foreign bodies in digestive tract

The prevalence of gastrointestinal foreign bodies is widely distributed, and there are differences in eating characteristics. There are many kinds of foreign bodies and different incarcerated parts. As a common emergency in gastroenterology, the incidence rate of male and female gastrointestinal tract is basically flat, and the incidence rate of afternoon sickness is significantly elevated in holidays, as well as summer and autumn. Other scholars believe that the incidence of foreign bodies in the digestive tract is not significantly related to the season, but the eating time is related to the foreign bodies in digestive tract. The association between incidence rate of foreign bodies has not been reported in literature. In recent years, the incidence rate and mortality rate of digestive tract foreign bodies have increased year by year [3]. Morbidity and mortality are not accurately reported. But the incidence rate in the United States is about 120000 cases / year [17], and the death toll is shocking. There are about 1500 cases. Analyzing the epidemiological characteristics of gastrointestinal foreign bodies can provide evidence for clinical diagnosis and treatment.

The vulnerable groups of foreign bodies in digestive tract include children, the elderly, adolescents, patients with intellectual disorders, mental and psychological diseases and drug addicts. People prone to foreign bodies in the digestive tract include children, the elderly, adolescents, mental retardation, patients with mental and psychological diseases, drug traffickers and criminals [18]. The predilection age of children is 6 months to 6 years [19-22]. It is reported that the common type of foreign body in children is coin [23, 24]. In recent years, button batteries have gradually become a common type of foreign bodies in children. The incidence rate of foreign bodies in the digestive tract is also high, and the proportion of the elderly is large. However, the incidence rate of foreign body incarceration in digestive tract is increasing year by year [3].

Opinions of ourselves believe that there is no difference in the incidence rate of gastrointestinal foreign bodies between urban and rural residents. However, due to the regional differences between urban and rural areas, urban patients often see a doctor in time, while rural patients generally do not see a doctor in time, resulting in a longer retention time of foreign bodies and more complications. We analyze that the possible reasons are the inconvenient transportation in rural areas, the low cultural level of

farmers, and the farmers' insufficient understanding of the harmfulness of foreign bodies in the digestive tract.

### Age and foreign bodies in digestive tract

Foreign bodies in the digestive tract are common in children and are a common disease in pediatric emergency [19-22]. They are common in children aged 6 months to 6 years. The common causes of foreign bodies in children's digestive tract include: Children's curiosity about unknown things, poor oral defense reflex compared with adults, esophageal physiological stenosis, unfavorable guardianship and lack of correct guidance [22]. The clinical manifestations are choking cough, food refusal, vomiting, salivation and crying [13, 25-27]. In addition, the elderly are also prone to incarceration of foreign bodies in the digestive tract [1, 28]. The reasons include: degenerative changes in swallowing movement and esophageal physiological function, insufficient food chewing, reduced sensitivity of nerves and muscles controlling swallowing reflex. Incarceration of foreign bodies for young people is rare compared with children and the elderly. The incidence rate is increasing year by year, which may be related to the bad eating habits at that age. In recent years, some epidemiological investigations have found that adolescents have become the main population with gastrointestinal foreign bodies. We analyze that this difference may be related to factors such as region and food culture. In addition, drug traffickers and criminals will deliberately swallow blades and lighters. Mental disorders often swallow clothing and daily necessities by mistake [3]. Totally, the vulnerable groups of foreign bodies in the digestive tract mainly include children, the elderly, adolescents, mental retardation and mental patients, drug traffickers and criminals [18].

### Foreign bodies and the season

Exploring the relationship between eating time, onset season and gastrointestinal foreign bodies has certain guiding significance for clinical practice. It is reported that there is no significant correlation between the incidence of foreign bodies in the digestive tract and the time of eating and the season of onset. However, we find that most patients often have foreign body incarceration in the digestive tract after lunch or dinner, and the incidence increased sharply in holidays, summer and autumn. The possible reasons include: (1) lunch and dinner are often more abundant than breakfast in China; (2) In summer and autumn, melons and fruits are fragrant, fish are fresh and crab is fat; (3) Social and dinner activities are intensive on holidays. Further research is needed to clarify the relationship between gastrointestinal foreign bodies and seasons to improve patients' awareness of prevention, popularize the publicity and education knowledge of gastrointestinal foreign bodies [3].

### Kinds of foreign bodies in digestive tract

There are many kinds of foreign bodies in digestive tract. The author classifies them according to the nature of foreign bodies: sharp foreign bodies (fishbone, bird bone, animal bone, iron wire, toothpick, etc.), slender foreign bodies (spoon, magnet, etc.), round blunt foreign bodies (coins, game coins, dentures, marbles, magnetic beads, fruit stones, etc.), corrosive foreign bodies (button batteries, etc.) and others (lighters, blades, zipper heads, etc.). Patients of different ages and regions have different types of incarceration of foreign bodies in the digestive tract [3]. Round blunt foreign bodies are common in children, among which coins are the most common, followed by irregular toys, magnets and button batteries [29-31]. It is worth noting that button battery incarceration has increased significantly with the popularity of electronic products [24]. The occurrence of foreign bodies in the digestive tract in children is relatively hidden, and most of them have no obvious clinical manifestations [23]. A few children can have symptoms such as food refusal and crying. Sharp and slender foreign bodies are common in the elderly, including fruit stones and fish bones, which can lead to

swallowing pain and other symptoms. Denture, as a special foreign body, is one of the most difficult foreign bodies to solve because of its large volume and sharp edge with the rise of tooth beauty industry [32]. Dentures are easy to be embedded in the cricopharyngeal muscle, and forced removal can lead to serious complications. In addition, drug traffickers and criminals deliberately swallowed dangerous goods such as blades and lighters in order to get access to medical treatment outside the prison[3]. Mental disorders often swallow clothes, accessories and daily necessities by mistake. jujube is abundant in northern China, and jujube seed has become a common foreign body type in northern China due to regional dietary differences [33]. The South and coastal area people like eating fish and shrimp, and fishbone is the most common foreign body type in the South China [34].

### Clinical manifestation of foreign body in digestive tract.

The clinical manifestation of foreign body in digestive tract varies with age and foreign body incarceration site [5]. The history of gastrointestinal foreign bodies in children is hidden. Most children have incarceration of gastrointestinal foreign bodies, which can be completely free of clinical symptoms and can be ruled out by themselves. However, some children may still have obvious symptoms. For example: refusal to eat, salivation, crying and fever. The guardian can help provide relevant clinical history. In addition to patients with mental and intellectual disabilities who cannot complain about their medical history, normal patients can describe the characteristics and discomfort symptoms of foreign bodies, such as dysphagia, swallowing obstruction, pharyngeal pain, abdominal pain, abdominal distension, constipation, hematemesis and black stool. If the foreign body pierces the hollow organs or compresses the surrounding tissues, it can be manifested as cough, shortness of breath, hematemesis, severe abdominal pain and peritoneal effusion[3].

The incarcerated site of foreign body in digestive tract can be related to the severity of symptoms. The esophagus is the most common site of foreign body incarceration in the digestive tract. Foreign bodies embedded in the esophagus often have obvious symptoms, while most patients have no obvious symptoms after foreign bodies enter the gastrointestinal tract through the esophagus[3]. Because of the function of circum pharyngeal muscle, foreign body incarceration is most likely to occur in the upper part of esophagus, resulting in swallowing pain [12]. The trachea and aorta pass by the middle of the esophagus. If the foreign body is embedded here, it is very easy to cause dyspnea, aortic rupture and bleeding, which is life-threatening. Foreign bodies are less embedded in the lower esophagus, the symptoms are atypical, and the complications are relatively rare. Most foreign bodies that pass through the esophagus and cardia can pass through the gastrointestinal tract. According to statistics, about 5% of foreign bodies will be incarcerated in the gastrointestinal tract, especially in the pyloric, duodenum, ileocecal and rectum. The longer the retention time of foreign body, the greater the risk of serious complications[3].

### Diagnostic analysis of foreign bodies in digestive tract

The diagnosis of foreign body in digestive tract consists of three elements, including history of foreign body incarceration, clinical manifestations and auxiliary examination. Medical history is the key to diagnosis [23]. According to the latest gastrointestinal foreign body guidelines published by the European Society of gastrointestinal endoscopy, it is recommended to conduct guidance and evaluation by the history of gastrointestinal foreign body incarceration and the clinical symptoms of foreign body incarceration[3].

### Diagnostic value of medical history

In clinical work, patients or family members provide detailed and accurate medical history, which provides strong evidence for clinicians to diagnose gastrointestinal foreign bodies, shortening the diagnosis and treatment time, reducing the occurrence of complications and improving the cure rate. However, for some special types of patients, such as patients with mental disorders, and autism who refuse to communicate, clinicians cannot obtain a reliable medical history, which requires clinicians to make a timely and accurate diagnosis of the disease with rich clinical tests and professional knowledge. For children with strong language expression ability, the juvenile can provide some medical history for clinicians' diagnosis and treatment. If children's language expression ability is weak and the child cannot provide reliable information, clinicians can only speculate whether there is foreign body incarceration through some alarm symptoms. In order to improve the diagnostic rate of gastrointestinal foreign bodies and avoid serious medical accidents caused by misdiagnosis and missed diagnosis, clinicians can assist in the diagnosis for patients who cannot accurately describe the history of foreign body incarceration.

### Diagnostic value of imaging

The imaging examination methods commonly used in clinic include X-ray, gastrointestinal barium meal and CT. X-ray examination has become an important method for the diagnosis of foreign bodies in digestive tract[3]. The European guidelines for pediatric gastroenterology and gastrointestinal endoscopy strongly recommend the use of X-ray plain films to assess the presence of gastrointestinal foreign body incarceration in children under the age of 18 [35], as well as the location, size, number and shape of foreign bodies [36]. However, for foreign bodies that are easy to penetrate X-ray, the sensitivity and positive rate of X-ray examination are low, and the negative rate can reach 47% [37], and also cannot show whether the foreign body has shown signs of complications. Gastrointestinal barium meal also has certain diagnostic significance for foreign body incarceration, but it cannot effectively evaluate the damage degree of gastrointestinal mucosal fold, which has great limitations. Therefore, for patients with severe clinical symptoms and possible serious complications, CT is usually used as the first choice for gastrointestinal foreign bodies. For foreign bodies easy to penetrate X-ray, CT examination has high sensitivity and specificity, and the diagnostic rate of foreign bodies in digestive tract is high [3]. Three-dimensional CT imaging can not only observe the integrity and continuity of gastrointestinal mucosa, but also view adjacent tissues and organs to evaluate whether there are injuries and serious complications[38]. Therefore, CT examination has become the first choice for imaging examination of gastrointestinal foreign bodies.

### Diagnostic value of endoscopy

Endoscopy is often used as the first choice for the diagnosis of gastrointestinal foreign bodies. Endoscopy plays a dual role in diagnosis and treatment. Endoscopy is less traumatic and has high sensitivity. Clinicians can intuitively understand the shape, size, number and incarcerated position of foreign bodies through endoscopy, judge the damage of foreign bodies to the digestive tract, and evaluate the specific scheme for the removal of foreign bodies in the digestive tract[3].

### Analysis of related factors of complications

Foreign bodies can damage gastrointestinal mucosa, leading to gastrointestinal erosion, congestion, ulcer, abscess, bleeding, perforation and other complications. A few patients can have gastrointestinal obstruction, dyspnea and aortic rupture and bleeding. The influencing factors of gastrointestinal foreign body complications are complex, and the relevant risk factors mainly include age, foreign body character, retention time and incarcerated site [3].

## Age and complications

The types and severity of complications in patients with gastrointestinal foreign bodies at different ages are different. As a common incidence population of foreign bodies in the digestive tract, children can suffer from functional dysplasia of the digestive tract. Foreign body incarceration often occurs in the upper part of the esophagus, resulting in mucosal congestion, erosion and injury. A few have obstruction and perforation, and there are no reports of death. The elderly generally have many basic diseases, low immunity and high risk of infection, which can lead to serious complications such as gastrointestinal obstruction and sepsis. Adolescent patients with gastrointestinal foreign bodies usually have no significant serious complications[3].

## Foreign body characteristics and complications

Sharp foreign bodies, slender foreign bodies and corrosive foreign bodies are the main risk factors for serious complications [17]. Sharp foreign bodies and slender foreign bodies are sharp and easy to damage digestive tract mucosa. After swallowing the foreign body by mistake, most elderly patients try to push the foreign body down by swallowing rice balls or large pieces of steamed bread. The foreign body may forcibly pass through the digestive tract and can penetrate the muscular layer of the digestive tract, resulting in gastrointestinal fistula, mediastinal and abdominal infection, sepsis and septic shock. Corrosive foreign bodies can also cause gastrointestinal perforation and fistula. It is reported that the button battery can cause peptic ulcer, perforation or stenosis through its own alkaline liquid leakage[3]. If foreign bodies invade large blood vessels, they can lead to hemorrhagic shock and endanger life[39]. In addition, magnetic foreign bodies attract each other in the intestine, which can cause intestinal obstruction and gastrointestinal perforation.

## Retention time and complications

The retention time of foreign bodies in digestive tract is closely related to serious complications. The longer the retention time of foreign bodies, the higher the incidence of complications. The retention time of foreign bodies is less than 24 hours, and most patients have no serious complications. When the retention time exceeds 24 hours, the incidence of gastrointestinal injury, ulcer, bleeding and perforation increases significantly [40]. It is reported that the incidence of gastrointestinal perforation and esophageal fistula will increase significantly no matter what type of foreign body if the retention time is more than 24 hours [40].

## Incarceration site and complications

There are significant differences in complications due to different incarceration sites of foreign bodies in the digestive tract. The middle esophagus is located at the intersection of trachea and aorta. Therefore, the middle esophagus has become the most dangerous part of foreign body incarceration in the digestive tract, which can lead to serious complications such as esophageal perforation, esophageal pleural fistula, pneumothorax and aortic rupture and bleeding. When the foreign body is embedded in the lower esophagus and gastrointestinal tract, the complications are less[3].

## Therapeutic method

According to the patient's age, clinical manifestation, size and shape of foreign body, foreign body incarceration site, complications and basic diseases, different treatment methods can be adopted for foreign body in digestive tract. There are three main treatment methods for gastrointestinal foreign bodies: conservative treatment, endoscopic treatment and surgery. For small round blunt foreign bodies, we can wait for them to be discharged from the body by themselves through the digestive tract. Endoscopic treatment is the most common for gastrointestinal foreign bodies that cannot be discharged by themselves.

Most patients will choose endoscopic foreign body removal. If failed, they will be treated with surgery [3]. It is reported that 80% of foreign bodies can pass through the digestive tract without special intervention [41]. The incidence of complications is also low. About 20% of foreign bodies needs endoscopic treatment, and only 1% of foreign bodies needs surgical intervention [18, 42]. If the patient has serious cardiopulmonary disease, endoscopic treatment can be performed under endotracheal intubation. If the endoscopic foreign body fails to remove or causes life-threatening complications such as gastrointestinal bleeding and perforation, surgery is needed. Compared with surgery, endoscopic treatment has less trauma, fewer complications, short hospital stay, low cost and good curative effect. Endoscopic treatment is often used as the preferred method [3].

## Endoscopic therapy

Most round blunt foreign bodies can be discharged smoothly through the digestive tract, and few foreign bodies retain in the ileocecal part and rectum. The foreign bodies can be removed by colonoscopy. If the foreign body has irregular shape (sharp or corrosive foreign body, multiple magnetic foreign bodies) and large diameter (diameter > 2.5cm, length > 6cm), it is difficult for the foreign body to pass through the esophagus, pylorus, duodenum and ileocecal part. Then the foreign body can be removed by emergency endoscopy [8]. The success rate of endoscopic foreign body removal is related to the patient's age, the nature of foreign body, the location of incarceration and the proficiency of digestive doctors. The literature reported that the success rate of endoscopic removal of foreign bodies abroad was more than 95%, while the success rate in China was about 94% [43]. According to the way of anesthesia, endoscopy includes painless endoscopy and ordinary endoscopy. Painless endoscopy refers to intravenous general anesthesia based on ordinary endoscopy. Patients can quickly remove foreign bodies without consciousness. Anesthesia can effectively alleviate patients' fear of endoscopic intervention and reduce the damage to the digestive tract during the removal of foreign bodies. It is worth noting that full preparation is needed before painless endoscopy, which has high anesthesia risk and high cost. In the actual diagnosis and treatment, most patients visit in the evening, and most emergency endoscopic treatment at night has no anesthesia support. In general endoscopy, patients with poor cooperation often induce foreign bodies to damage gastrointestinal mucosa. However, compared with painless endoscopic therapy, ordinary endoscopic therapy is relatively fast and does not need to make sufficient preoperative preparation [3]. The foreign bodies in children's digestive tract are hidden, mainly embedded with real foreign bodies. Coins are more common and embedded in the upper part of the esophagus. When the foreign bodies will be removed in children's digestive tract under endoscopy, almost all children choose endoscopy under general anesthesia because it is difficult for children to cooperate. The success rate of surgery is more than 95% and the incidence of complications is less than 5%[29]. For the failure of endoscopic treatment or serious complications caused by foreign bodies in the digestive tract, surgical treatment is directly performed [44].

## Surgical treatment

If the shape of the foreign body is regular and the diameter is small, and the clinical manifestation and imaging examination do not suggest serious complications, the patient can take endoscopic treatment[31]. If the foreign body stays for a long time, resulting in gastrointestinal perforation and aortic rupture and bleeding, the patient must be treated with surgery. Compared with endoscopic treatment, the safety factor of surgery is relatively high, but the operation is complex, the operation trauma is large, the hospital stay is long and the cost is high. The sharper the foreign body in digestive tract, the longer the retention time, the higher the risk of

serious complications and the greater the possibility of surgical treatment [3].

## Conclusion

Foreign bodies in digestive tract are common, which tend to occur in children and the elderly. With the change of life rhythm and life mode, teenagers have gradually become the prone group of gastrointestinal foreign bodies, and young adults are becoming the main group of patients with gastrointestinal foreign bodies. The incidence ratio between men and women is controversial. It is reported that there are more men than women in patients with gastrointestinal foreign bodies, and it is also reported that women are more than men. We analyze that this may be related to region, diet and lifestyle. Incarceration of foreign bodies in digestive tract often occurs after lunch and dinner in summer and autumn. Although there is no relevant literature report in China, there is a great correlation between eating time and season and the incidence of gastrointestinal foreign bodies according to the analysis of clinical medical records. Coins and articles for daily use are common types of foreign bodies in children's digestive tract, while fish bones and poultry bones are common types of foreign bodies in adults. The clinical manifestations of foreign body incarceration are related to the characteristics of foreign body and the specific location of incarceration, but some scholars do not agree with this view. The diagnosis of foreign body in digestive tract and the incarcerated site of foreign body need means of imaging. Prevention is still the key factor. Children and their guardians should enhance health awareness, strengthen personal protection and health education, and avoid foreign bodies entering the digestive tract by mistake. The elderly should choose soft and digestible food, slow down their eating speed, chew and swallow carefully, and reduce the occurrence of foreign bodies in the digestive tract. Clinicians usually diagnose gastrointestinal foreign bodies through the patient's medical history, clinical manifestations and imaging data, among which CT scan has become the first choice for the diagnosis of gastrointestinal foreign bodies. Endoscopy is the most common treatment for gastrointestinal foreign bodies, and surgical intervention accounts for only a small part. Gastrointestinal foreign body is a common clinical disease, and prevention is an effective method to avoid foreign body incarceration. However, the right diagnosis and timely treatment of patients with gastrointestinal foreign bodies can shorten the time of foreign body incarceration, reduce the average hospital stay and cost, and prevent the occurrence of complications.

## Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

## Author's contributions

Collection of data and writing: Dao-Hui Wei.

Final approval of the manuscript: Wei Liu.

## References

- Kim JP, Kwon OJ, Shim HS et al. (2015). Analysis of Clinical Feature and Management of Fish Bone Ingestion of Upper Gastrointestinal Tract. *Clinical and experimental otorhinolaryngology*. 8(3):261-267.
- Shivakumar AM, Naik AS, Prashanth KB et al. (2006). Foreign bodies in upper digestive tract. *Indian journal of otolaryngology and head and neck surgery: official publication of the Association of Otolaryngologists of India*. 58(1):63-68.
- Birk M, Bauerfeind P, Deprez PH et al. (2016). Removal of foreign bodies in the upper gastrointestinal tract in adults: European Society of Gastrointestinal Endoscopy (ESGE) Clinical Guideline. *Endoscopy*. 48(5):489-496.
- Jaan A, Mulita F. (2022). *Gastrointestinal Foreign Body*. In: Stat Pearls. edn. Treasure Island (FL): Stat Pearls Publishing
- Eisen GM, Baron TH, Dominitz JA et al. (2002). Guideline for the management of ingested foreign bodies. *Gastrointestinal endoscopy*. 55(7):802-806.
- Tumay V, Guner OS, Meric M et al. (2015). Endoscopic Removal of Duodenal Perforating Fishbone - A Case Report. *Chirurgia (Bucharest, Romania)*. 110(5):471-473.
- Mosca S, Manes G, Martino R et al. (2001). Endoscopic management of foreign bodies in the upper gastrointestinal tract: report on a series of 414 adult patients. *Endoscopy*. 33(8):692-696.
- Chauvin A, Viala J, Marteau P et al. (2013). Management and endoscopic techniques for digestive foreign body and food bolus impaction. *Digestive and liver disease: official journal of the Italian Society of Gastroenterology and the Italian Association for the Study of the Liver*. 45(7):529-542.
- Park JH, Park CH, Park JH et al. (2004). [Review of 209 cases of foreign bodies in the upper gastrointestinal tract and clinical factors for successful endoscopic removal]. *The Korean journal of gastroenterology = Taehan Sohwagi Hakhoe chi*. 43(4):226-233.
- Loh KS, Tan LK, Smith JD et al. (2000). Complications of foreign bodies in the esophagus. *Otolaryngology--head and neck surgery: official journal of American Academy of Otolaryngology-Head and Neck Surgery*. 123(5):613-616.
- Ginsberg GG. (1995). Management of ingested foreign objects and food bolus impactions. *Gastrointestinal endoscopy*. 41(1):33-38.
- Dray X, Cattan P. (2013). Foreign bodies and caustic lesions. *Best practice & research Clinical gastroenterology*. 27(5):679-689.
- Palta R, Sahota A, Bemarki A et al. (2009). Foreign-body ingestion: characteristics and outcomes in a lower socioeconomic population with predominantly intentional ingestion. *Gastrointestinal endoscopy*. 69(3):426-433.
- Savran B, Zeren S, Coşgun S et al. (2015). Endoscopic Removal of 15 Gastrointestinal Foreign Bodies. *APSP journal of case reports*. 6(3):28.
- Abdullah BJ, Teong LK, Mahadevan J et al. (1998). Dental prosthesis ingested and impacted in the esophagus and orolaryngopharynx. *The Journal of otolaryngology*. 27(4):190-194.
- Yao CC, Wu IT, Lu LS et al. (2015). Endoscopic Management of Foreign Bodies in the Upper Gastrointestinal Tract of Adults. *BioMed research international*. 2015:658602.
- Fung BM, Sweetser S, Wong Kee Song LM et al. (2019). Foreign object ingestion and esophageal food impaction: An update and review on endoscopic management. *World journal of gastrointestinal endoscopy*. 11(3):174-192.
- Ambe P, Weber SA, Schauer M et al. (2012). Swallowed foreign bodies in adults. *Deutsches Arzteblatt international*. 109(50):869-875.
- Stack LB, Munter DW. (1996). Foreign bodies in the gastrointestinal tract. *Emergency medicine clinics of North America*. 14(3):493-521.
- Eliason MJ, Ricca RL, Gallagher TQ. (2017). Button battery ingestion in children. *Current opinion in otolaryngology & head and neck surgery*. 25(6):520-526.
- Kodituwakku R, Palmer S, Paul SP. (2017). Management of foreign body ingestions in children: button batteries and magnets. *British journal of nursing (Mark Allen Publishing)*. 26(8):456-461.
- Ventura F, Candosin S, Barranco R et al. (2017). A Fatal Case of Coin Battery Ingestion in an 18-Month-Old Child: Case Report and Literature Review. *The American journal of forensic medicine and pathology*. 38(1):43-46.
- Bolton SM, Saker M, Bass LM. (2018). Button battery and magnet

- ingestions in the pediatric patient. *Current opinion in pediatrics*. 30(5):653-659.
24. Huang T, Li WQ, Xia ZF et al. (2018). Characteristics and outcome of impacted button batteries among young children less than 7 years of age in China: a retrospective analysis of 116 cases. *World journal of pediatrics: WJP*. 14(6):570-575.
  25. Kramer RE, Lerner DG, Lin T et al. (2015). Management of ingested foreign bodies in children: a clinical report of the NASPGHAN Endoscopy Committee. *Journal of pediatric gastroenterology and nutrition*. 60(4):562-574.
  26. Blaho KE, Merigian KS, Winbery SL et al. (1998). Foreign body ingestions in the Emergency Department: case reports and review of treatment. *The Journal of emergency medicine*. 16(1):21-26.
  27. Kamal I, Thompson J, Paquette DM. (1999). The hazards of vinyl glove ingestion in the mentally retarded patient with pica: new implications for surgical management. *Canadian journal of surgery Journal canadien de chirurgie*. 42(3):201-204.
  28. Sheth N, Diner WC. (1988). Swallowing problems in the elderly. *Dysphagia*. 2(4):209-215.
  29. Mori T, Ihara T, Hagiwara Y. (2018). Pediatric food impaction detected through point-of-care ultrasonography. *Clinical and experimental emergency medicine*. 5(2):135-137.
  30. Orsagh-Yentis D, McAdams RJ, Roberts KJ et al. (2019). Foreign-Body Ingestions of Young Children Treated in US Emergency Departments: 1995-2015. *Pediatrics*. 143(5).
  31. Denney W, Ahmad N, Dillard B et al. (2012). Children will eat the strangest things: a 10-year retrospective analysis of foreign body and caustic ingestions from a single academic center. *Pediatric emergency care* 28(8):731-734.
  32. McNicholas WT, Bonsignore MR. (2007). Sleep apnoea as an independent risk factor for cardiovascular disease current evidence, basic mechanisms and research priorities. *The European respiratory journal*. 29(1):156-178.
  33. Zhang S, Cui Y, Gong X et al. (2010). Endoscopic management of foreign bodies in the upper gastrointestinal tract in South China: a retrospective study of 561 cases. *Digestive diseases and sciences*. 55(5):1305-1312.
  34. Zhang X, Jiang Y, Fu T et al. (2017). Esophageal foreign bodies in adults with different durations of time from ingestion to effective treatment. *The Journal of international medical research*. 45(4):1386-1393.
  35. Al Lawati TT, Al Marhoobi R. (2018). Patterns and Complications of Ingested Foreign Bodies in Omani Children. *Oman medical journal*. 33(6):463-467.
  36. Ikenberry SO, Jue TL, Anderson MA et al. (2011). Management of ingested foreign bodies and food impactions. *Gastrointestinal endoscopy*. 73(6):1085-1091.
  37. Weiland ST, Schurr MJ. (2002). Conservative management of ingested foreign bodies. *Journal of gastrointestinal surgery: official journal of the Society for Surgery of the Alimentary Tract*. 6(3):496-500.
  38. Chioukh FZ, Ben Ameer K, Abdelkafi M et al. (2017). [Respiratory distress revealing an esophageal foreign body in a neonate]. *Archives de pediatrie: organe officiel de la Societe francaise de pediatrie*. 24(2):189-191.
  39. Green SS. (2015). Ingested and Aspirated Foreign Bodies. *Pediatrics in review*. 36(10):430-436.
  40. Wu WT, Chiu CT, Kuo CJ et al. (2011). Endoscopic management of suspected esophageal foreign body in adults. *Diseases of the esophagus: official journal of the International Society for Diseases of the Esophagus*. 24(3):131-137.
  41. Hachimi-Idrissi S, Corne L, Vandenplas Y. (1998). Management of ingested foreign bodies in childhood: our experience and review of the literature. *European journal of emergency medicine: official journal of the European Society for Emergency Medicine*. 5(3):319-323.
  42. Ko HH, Enns R. (2008). Review of food bolus management. *Canadian journal of gastroenterology = Journal canadien de gastroenterology*. 22(10):805-808.
  43. Yuan J, Ma M, Guo Y et al. (2019). Delayed endoscopic removal of sharp foreign body in the esophagus increased clinical complications: An experience from multiple centers in China. *Medicine*. 98(26):16146.
  44. Altokhais TI, Al-Saleem A, Gado A et al. (2017). Esophageal foreign bodies in children: Emphasis on complicated cases. *Asian journal of surgery*. 40(5):362-366.



This work is licensed under Creative Commons Attribution 4.0 License

To Submit Your Article Click Here:

**Submit Manuscript**

DOI: [10.31579/2693-4779/093](https://doi.org/10.31579/2693-4779/093)

**Ready to submit your research? Choose Auctores and benefit from:**

- fast, convenient online submission
- rigorous peer review by experienced research in your field
- rapid publication on acceptance
- authors retain copyrights
- unique DOI for all articles
- immediate, unrestricted online access

At Auctores, research is always in progress.

Learn more <https://auctoresonline.org/journals/clinical-research-and-clinical-trials>