Does motivation matter? A systematic review and meta-analysis of outcomes following intentional foreign object ingestion.

Jack Galbraith-Edge, Mark Stanton, and Giles Cattermole *†

May 22, 2025

I. Abstract

II. Introduction

Rationale

Deliberate foreign body ingestion (DFBI) is defined as non-accidental ingestion of a true foreign body (non-nutritive items) for parasuicidal reasons [1].

In 1635, Daniel Schwaban performed a gastrotomy on a man who had swallowed a knife [2]. In 1738, Gorsauld is credited as the first surgeon to perform a cervical esophagotomy for the removal of a foreign body (FB) [3]. In 1906, José Goyanes extracted a coin impacted in the esophagus using a rigid esophagoscope [4]. The early 20th century saw the emergence of rigid esophagoscopy as the first large-scale method for foreign body extraction, with further case series detailing technical refinements appearing in the literature [5, 6].

Among the most extraordinary documented cases is that by Chalk, who reported a psychiatric patient ingesting 2,533 objects weighing a total of 21,268 grams [7]. The largest single ingested item reported measured 28 cm in length [8].

Psychiatric conditions most frequently associated with intentional ingestion of foreign objects (IIFO) include psychosis, malingering, pica, and personality disorders [9, 10]. The term "pica" originates from the Latin word for "magpie," reflecting the bird's tendency to collect unusual items [11], and has been reported globally [12].

Malingering can present in various forms, particularly in prison populations where manipulation to trigger medical transfer is a noted motivation [9, 10, 13]. In such cases, the optimal management often involves brief medical intervention with minimal reinforcement, followed by prompt return to custody [14]. In contrast, individuals with obsessive-compulsive disorder (OCD) may describe escalating anxiety prior to ingestion followed by a sense of relief afterward [9].

In cases involving borderline personality disorder, Gitlin et al. [10] suggest that IIFO may function as an affect regulation strategy, particularly during episodes of perceived abandonment. While such behaviour may appear life-threatening, it should not be presumed to indicate suicidal intent [9].

A wide range of psychiatric diagnoses have been associated with recurrent foreign body ingestion, including pica, personality disorder, impulse control disorder, OCD, autism spectrum disorder, factitious disorder (including Munchausen syndrome), intellectual disability, psychosis, and malingering [10, 15]. In rare and severe cases, some authors have proposed a palliative care approach to repeated IIFO, recognising the limited prognosis associated with treatment-resistant psychiatric illness and the cumulative harms of repeated surgical intervention [16].

Motivations for IIFO can include relief from psychological symptoms, self-punishment, attempts to influence others, or command hallucinations [17]. Notably, ingestion alone should not be assumed to indicate suicidal intent [9].

Clinical outcomes are influenced by various factors, including patient age, comorbidities, object characteristics (size, shape, composition, anatomical location), and the time elapsed since ingestion [18]. In a seminal study of incarcerated individuals, Karp et al. [19] found that motivations for ingestion included suicidal ideation with and without command hallucinations, self-harm without suicidal intent, and manipulation of the medicolegal system.

In correctional populations, multivariate analysis has shown that the number of ingested items significantly increases the likelihood of hospital admission, endoscopy, and surgery. Endoscopic intervention, in turn, significantly reduces the odds of requiring surgical management [20].

A recent report from a UK acute NHS trust identified a rise in IIFO cases during the COVID-19 pandemic [21]. While motivation remains a complex and poorly understood element of this phenomenon, tools such as the SIMS-II Motivation Scale may provide standardised frameworks for future analysis [22].

More broadly, the global displacement crisis has reached unprecedented levels, with over 100 million forcibly displaced individuals reported by the United Nations High Commissioner for Refugees (UNHCR) as of May 2024 [23]. Refugees and asylum seekers often endure extreme hardships, compelling them to seek asylum in foreign countries [24, 25]. This vulnerable population frequently faces compounded mental health challenges due to traumatic pre-migration experiences, hazardous journeys, and difficult post-migration realities, including detention and instability of legal status [26–29].

Self-harm, encompassing various behaviours where individuals inflict harm on themselves, is a particularly alarming manifestation of these mental health challenges. Rates of self-harm are significantly elevated among asylum seekers and refugees compared to general populations, especially among those who are detained, with rates up to 216 times higher in offshore detention facilities than in the general population [30–32].

Methods of suicide and self-harm among refugees differ based on available means, cultural factors, and motivating factors [33]. Common methods include cutting, self-battery, attempted hanging, self-poisoning by medication or chemicals, and ingestion of foreign objects [31].

*Jack Galbraith-Edge and Giles Cattermole are with Queen Mary, University of London, London, United Kingdom (e-mail: ha201591@qmul.ac.uk; g.cattermole@qmul.ac.uk).

†Mark Stanton is a Critical Care Paramedic, Johannesburg, South Africa (e-mail: trauma.1@mweb.co.za).

Globally, rates of foreign object ingestion are increasing. In the United States, rates doubled in 2017, with 14

Most ingested foreign bodies (80–90

Despite the rising prevalence and potential severity of IIFO, there is limited research exploring how motivations for ingestion differ across vulnerable groups and how these motivations may influence clinical outcomes [34–36]. Literature to date largely focuses on IIFO in prisons or psychiatric contexts, with sparse data from displaced or asylum-seeking populations. In detention, where traditional communication channels are obstructed, ingestion may serve as a form of protest or distress signal [37]. Conversely, in psychiatric settings, ingestion may reflect mental illness or affective dysregulation [10, 17, 38–40].

These varying motivations likely influence clinical management, including decisions around the need for endoscopic or surgical intervention. For instance, if ingestion is primarily intended as protest, patients may avoid behaviours that risk severe harm, potentially lowering the threshold for conservative management.

This systematic review aims to address these gaps by evaluating how motivation for IIFO influences clinical outcomes in vulnerable populations. Specifically, we aim to examine how different motivations impact the need for endoscopic and surgical interventions, thereby informing future clinical strategies and healthcare responses. The protocol is registered with PROSPERO and adheres to PRISMA guidelines [41].

Objectives

This systematic review aims to quantify the rates of endoscopic and surgical interventions following intentional ingestion of foreign objects in human populations. It also seeks to examine how individual factors—such as demographic characteristics and motivations for ingestion (including protest, self-harm, or suicidal intent)—influence the likelihood of requiring invasive intervention. Finally, the review assesses how the type of object ingested is associated with clinical outcomes, including the need for endoscopic or surgical procedures and the incidence of complications.

III. Methods

Eligibility Criteria

The review included studies involving human participants of any age who had intentionally ingested foreign objects via the oral cavity. Eligible exposures included deliberate ingestion events, regardless of motivation. Studies were considered if they included data on motivations for ingestion—such as protest, suicidal intent, self-harm, or psychiatric conditions—as well as details regarding management strategies, including whether conservative, endoscopic, or surgical treatment was used. Object-related factors such as type (e.g., blunt, sharp, long, short, multiple objects) were also criteria for inclusion.

Studies were required to report on at least one of the following outcomes: endoscopic intervention, surgical intervention, conservative management, complication rates, or mortality. All clinical settings were eligible, and a wide range of study designs were accepted, including observational studies (cohort, case-control, cross-sectional), case series, clinical trials, and case reports.

A full list of eligibility criteria is availabe in Appendix A-A and a full list of exclusion criteria is available in Appendix A-B.

Information Sources

Relevant articles were identified through a systematic search of PubMed, Web of Science, Embase, Scopus, PsycINFO, CENTRAL and Google Scholar on 15th January 2025, with the assistance of a librarian. After title and abstract screening and full text review, included articles then had their bibliography's searched by the primary author (JGE) on 14th May 2025.

Search Strategy

The search was conducted using keywords and MeSH terms based on the concepts underpinning this review. The bibliography of each included article was searched for any further relevant articles. The keywords and MeSH terms used can be found in Appendix B.

Selection Process

All identified articles were collated using Python (Pandas) [42]. Duplicate articles were identified and removed based on non-unique combinations of author, title, and DOI.

Following duplicate removal, all remaining articles underwent independent title and abstract screening conducted by the first author (JGE). To ensure consistency, a randomly selected 10% sample of these articles underwent independent screening by a second author (MS). Any discrepancies identified between these two reviewers were resolved by a third reviewer (GC).

Articles included after title and abstract screening proceeded to full-text review, which was initially performed by JGE. Again, a random 10% sample of these full-text articles underwent independent assessment by MS. Discrepancies between JGE and MS at the full-text screening stage were similarly resolved by a third review from GC.

Inter-reviewer agreement at each screening stage was calculated using Python (Pandas for data management [42] and Scikit-learn for statistical analysis [43])

Data Collection Process

Data were extracted by a single reviewer (JGE) into an Excel [44] spreadsheet. Variables for extraction were developed through an iterative process of engaging with the literature and identifying consistent patterns in the data reported. A preliminary analysis of the first 30 case reports informed the development of additional data categories, which were subsequently applied to the remaining reports. Once the case report data were extracted, these structured variables were used to guide the extraction of aggregate data from case series. Studies were grouped for extraction according to their classification as case reports or case series. Where case series contained sufficiently granular data, cases were extracted individually and treated as case reports; otherwise, data were extracted at the aggregate level. Case grouping for analysis was based on whether they met criteria for inclusion as individual case reports or case series, as defined above. Relevant data from reviews and other literature types were recorded under the case report category.

Data Items

Data were extracted for a range of outcomes, including rates of endoscopic and surgical intervention, conservative management, mortality, and ingestion-related complications such as perforation

or obstruction. Where reported, other outcomes including injuries requiring intervention or additional medical consequences were also recorded.

Additional variables included demographic characteristics (e.g. psychiatric history, prisoner or displacement status), motivational factors (e.g. intent to self-harm, protest, psychiatric or psychosocial drivers), and object features (e.g. length, sharpness, presence of magnets or batteries, and quantity ingested). Full definitions of all variables are provided in Appendix C.

The full dataset of extracted case-level and study-level data (including bias assesments), is available as Supplementary Tables S1 and S2 (provided as separate files).

Risk of Bias Assessment

Risk of bias was assessed manually for all included studies by a single reviewer (JGE), using the Joanna Briggs Institute (JBI) Critical Appraisal Checklists for Case Reports and Case Series [45]. Studies were first classified as either case reports or case series based on the level of granularity in the data. Case reports and case series were assessed using corresponding JBI tool.

Following manual appraisal, a secondary risk-of-bias filter was applied using *Python Pandas* [42]. This logic-based filter identified studies where key variables — specifically *Outcome*, *Motivation*, or *Object* — were missing or marked as unknown. For case series, if any of the derived aggregate fields (e.g. *Outcome_Unknown_Rate*, *Motivation_Unknown_Rate*, *Object_Unknown_Rate*) did not equal 0 (i.e. reporting was incomplete for the entire population of the study), the study was flagged as high risk. Similarly, case reports where any of these variables were unknown were also considered high risk.

Studies classified as high risk through this process were excluded from analysis. This two-stage approach — involving initial manual assessment and subsequent automated validation — ensured both qualitative and quantitative scrutiny of bias across the dataset.

IV. Results

Study Selection

A total of 673 records were identified through initial database searches: PubMed (317), WoS (277), Embase (25), SCOPUS (24), PsycINFO (16), and Cochrane (14).

Following the removal of duplicate records—based on combinations of publication year, title, author, and DOI—313 duplicates were excluded. This left 360 unique database records for screening: PubMed (258), Web of Science (65), Cochrane (14), SCOPUS (12), Embase (9), PsycINFO (2). A Google Scholar search yielded 135 results. 3 duplicates were removed manually. Thus, 132 records proceeded to screening. Database records (360) and Google Scholar records (132) were then merged, yielding a total of 492 records.

Title and abstract review was then undertaken. JGE reviewed all 492 records. A random sample of 49 records was generated for independent screening MS. After title and abstract screening, Cohen's Kappa was calculated for inter-reviewer agreement between JGE and MS, yielding a value of 0.38, indicating fair agreement. Where JGE and MS disagreed, 16 records were reviewed by GC. In total, 176 records were excluded, leaving 316 for full text review.

During full text review, JGE reviewed all 316 records. A random sample of 32 records was generated for independent review by MS. Inter-reviewer agreement was calculated using Cohen's Kappa, yielding a value of 0.45, indicating fair agreement. Where JGE and MS disagreed, 5 records were reviewed by GC. In total, 224 records were excluded during full text review. 92 records were included and proceeded to bibliography search.

The bibliographies of the 92 included from full text review were searched by JGE manually. A list of included papers were collated using Python Pandas [42], ensuring each included item had its bibliography searched. Relevant bibliography items were identified; compared to the eligibility criteria; and collated in Zotero [46]. The bibliography search results were then exported from Zotero as a CSV and input into Pandas for analysis, manipulation and duplicate removal.

In total, 204 records were identified during bibliography searching. Using *Python Pandas*, bibliography search records were then programatically compared to title and abstract screen and full text review records. In this process, 12 duplicates were identified. 194 full text bibliography search records were reviewed by JGE. 121 bibliography search records were excluded, leaving 73 for inclusion.

Therefore, a total of 165 records were included in this study and proceeded to bias assessment. This process is illustrated in Figure 1.

Risk of Bias

Case Reports: 195 cases from 134 studies [10, 13–15, 47–176] were evaluated using the JBI Checklist for Case Reports [45]. Motivation was not reported in 102 cases from 65 studies [10, 49, 52, 56, 60, 61, 68–70, 72, 74, 76, 77, 80, 81, 83–85, 87, 89, 92, 93, 96, 97, 99, 101–105, 108–110, 113, 115, 118, 120, 121, 124, 127, 128, 131, 132, 134–136, 139, 140, 142, 144, 145, 147, 149, 154, 158, 160–162, 165, 167–169, 172, 173, 175]. Given that this review specifically aims to explore how motivation influences clinical outcomes, the absence of this information was considered a critical limitation. As a result, these cases were classified as high risk of bias and excluded from the final analysis. Of the remaining cases (82), most clearly described intervention treatment (100%), post intervention condition (98%), and takeaway lessons (98%). Reporting was also strong for history timeline (94%), and patient demographic (93%). However, fewer studies reported diagnostic assessment (88%), harms (88%), and current condition (85%).

Case Series: Seperately, 31 studies [4, 17, 177–205] were evaluated using the JBI Checklist for Case Series [45]. 1 study [17] did not report any of the outcomes of interest. 26 studies [4, 17, 178–180, 182–187, 190–201, 203–205] did not report motivation or reported partial reasons for motivation (i.e. for some of the included population, but not all). 7 studies [17, 177, 178, 186, 192, 200, 203] did not report object characteristics, or reported them partially. Therefore, 27 studies [4, 17, 177–180, 182–187, 190–201, 203–205] were considered high risk of bias and excluded from analysis. Exclusions were based on the absence of information essential to the review question — specifically, the reporting of motivation, object characteristics, and clinical outcomes. These variables were required to assess how motivation may influence treatment decisions and patient outcomes. As such, studies lacking this information were considered unable to meaningfully contribute to the synthesis and were excluded to preserve the integrity of the analysis. This

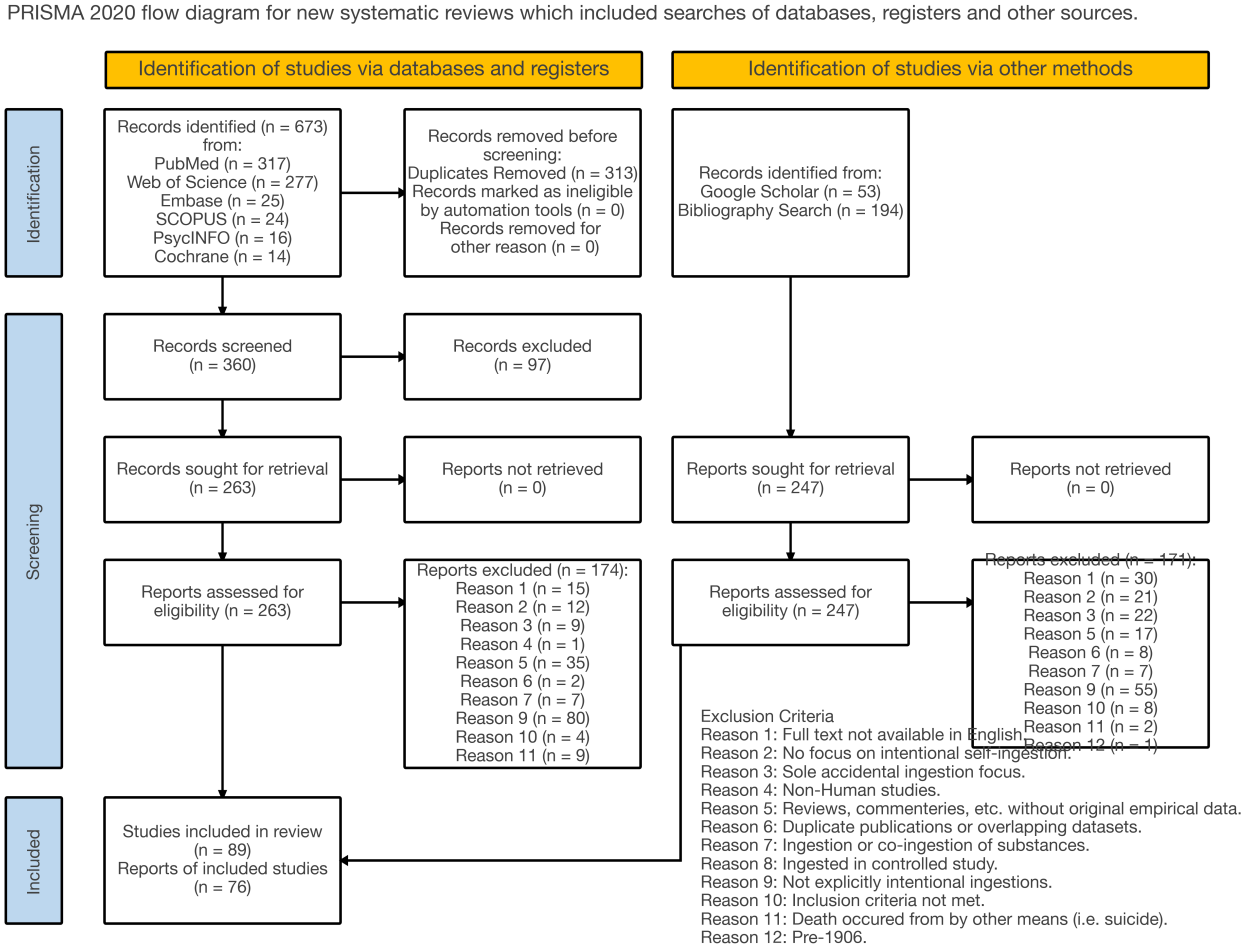

Fig. 1: PRISMA flow diagram summarising the study selection process.

left 2 studies [181, 188]. Most clearly described clear inclusion criteria (100%), standard condition measurement (100%), valid id method (100%), consecutive inclusion (100%), complete inclusion (100%), clear demographic reporting (100%), clear clinical info reporting (100%), clear outcome followup reported (100%), clear site demographic reporting (100%), and appropriate statistical analysis (100%).

Study Characteristics

The included studies comprised the following designs: Case Report (123 studies): [13, 15, 47–67, 69–84, 86–95, 97–101, 103, 104, 106–108, 110–121, 123, 125, 127–132, 134–138, 140–176, 191, 199]; Case Series (39 studies): [4, 10, 14, 17, 68, 96, 102, 105, 109, 124, 126, 133, 177–190, 192–198, 200–205]; Review (3 studies): [85, 122, 139].

References

[1] Aymeric Becq, Marine Camus, and Xavier Dray. "Foreign Body Ingestion: Dos and Don'ts". In: *Frontline Gastroenterology* 12.7 (Dec. 2021), pp. 664–670. ISSN: 2041-4137, 2041-4145. DOI: 10.1136/flgastro-2020-101450. (Visited on 05/15/2025).

[2] F. G. Moehlau. "Gastrostomy in the Seventeenth Century". In: *Buffalo Medical Journal* 35.5 (Dec. 1895), pp. 395–397. ISSN: 1040-3817.

[3] James H Saint. "Surgery Of The Esophagus". In: *Archives of Surgery* 19.1 (July 1929), pp. 53–128. ISSN: 0272-5533. DOI: 10.1001/archsurg.1929.01150010056003. (Visited on 04/15/2025).

[4] J. L. Barros et al. "Foreign Body Ingestion: Management of 167 Cases". In: *World Journal of Surgery* 15.6 (1991), pp. 783–788. ISSN: 0364-2313. DOI: 10.1007/BF01665320.

[5] William Lerche. "THE ESOPHAGOSCOPE IN REMOVING SHARP FOREIGN BODIES FROM THE ESOPHAGUS". In: *Journal of the American Medical Association* LVI.9 (Mar. 1911), p. 634. ISSN: 0002-9955. DOI: 10.1001/jama.1911.02560090004002. (Visited on 04/15/2025).

[6] Chevalier L. Jackson. "Foreign Bodies in the Esophagus". In: *The American Journal of Surgery* 93.2 (Feb. 1957), pp. 308–312. ISSN: 00029610. DOI: 10.1016/0002-9610(57)90783-3. (Visited on 04/15/2025).

[7] S. G. Chalk. "FOREIGN BODIES IN THE STOMACH: REPORT OF A CASE IN WHICH MORE THAN TWO THOUSAND FIVE HUNDRED FOREIGN BODIES WERE FOUND". In: *Archives of Surgery* 16.2 (Feb. 1928), p. 494. ISSN: 0272-5533. DOI: 10.1001/archsurg.1928.01140020045003. (Visited on 04/15/2025).

[8] G. C. Ricote et al. “Fiberendoscopic Removal of Foreign Bodies of the Upper Part of the Gastrointestinal Tract”. In: *Surgery, Gynecology & Obstetrics* 160.6 (June 1985), pp. 499–504. ISSN: 0039-6087.

[9] Brittany A. Poynter et al. “Hard to Swallow: A Systematic Review of Deliberate Foreign Body Ingestion.” In: *General hospital psychiatry* 33.5 (Oct. 2011), pp. 518–524. ISSN: 1873-7714 0163-8343. DOI: 10.1016/j.genhosppsych.2011.06.011.

[10] David F. Gitlin et al. “Foreign-Body Ingestion in Patients with Personality Disorders”. In: *Psychosomatics* 48.2 (2007), pp. 162–166. ISSN: 0033-3182. DOI: 10.1176/appi.psy.48.2.162.

[11] H. I. Kaplan and B. J. Sandock. *Kaplan & Sadock’s Comprehensive Textbook of Psychiatry*. Philadelphia : Wolters Kluwer Health/Lippincott Williams & Wilkins, 2009. ISBN: 978-0-7817-6899-3. (Visited on 04/16/2025).

[12] I. J. McLoughlin. “The Picas”. In: *British Journal of Hospital Medicine* 37.4 (Apr. 1987), pp. 286–290. ISSN: 0007-1064.

[13] J. E. Losanoff, K. T. Kjossev, and H. E. Losanoff. “Oesophageal ”Cross”–a Sinister Foreign Body”. In: *Journal Of Accident & Emergency Medicine* (1997). DOI: 10.1136/emj.14.1.54.

[14] Kari E. Blaho et al. “Foreign Body Ingestions in the Emergency Department: Case Reports and Review of Treatment”. In: *Journal of Emergency Medicine* 16.1 (Jan. 1998), pp. 21–26. ISSN: 0736-4679, 1090-1280. DOI: 10.1016/S0736-4679(97)00229-1. (Visited on 04/14/2025).

[15] D. Guinan et al. “Intentional Foreign Body Ingestion: A Complex Case Of Pica”. In: *Case Reports In Gastrointestinal Medicine* (2019). DOI: 10.1155/2019/7026815.

[16] Paresh A. Jaini, James Haliburton, and A. John Rush. “Management Challenges of Recurrent Foreign Body Ingestions in a Psychiatric Patient: A Case Report.” In: *Journal of psychiatric practice* 29.2 (Mar. 2023), pp. 167–173. ISSN: 1538-1145 1527-4160. DOI: 10.1097/PRA.0000000000000694.

[17] Samuel Tromans et al. “Deliberate Ingestion of Foreign Bodies as a Form of Self-Harm among Inpatients within Forensic Mental Health and Intellectual Disability Services”. In: *Journal of Forensic Psychiatry & Psychology* 30.2 (Apr. 2019), pp. 189–202. ISSN: 1478-9949. DOI: 10.1080/14789949.2018.1530287.

[18] Steven O. Ikenberry et al. “Management of Ingested Foreign Bodies and Food Impactions”. In: *Gastrointestinal Endoscopy* 73.6 (June 2011), pp. 1085–1091. ISSN: 00165107. DOI: 10.1016/j.gie.2010.11.010. (Visited on 11/18/2024).

[19] Joyce G. Karp, Laura Whitman, and Antonio Convit. “Intentional Ingestion of Foreign Objects by Male Prison Inmates”. In: *Hospital & Community Psychiatry* 42.5 (May 1991), pp. 533–535. ISSN: 0022-1597.

[20] Poorvi P. Dalal et al. “Intentional Foreign Object Ingestions: Need for Endoscopy and Surgery.” In: *The Journal of surgical research* 184.1 (Sept. 2013), pp. 145–149. ISSN: 1095-8673 0022-4804. DOI: 10.1016/j.jss.2013.04.078.

[21] B Jones and A Roskilly. “Management of Deliberate Foreign Body Ingestion Requiring Endoscopic Retrieval”. In: *Gut* (2023). DOI: 10.1136/gutjnl-2023-bsg.307.

[22] Yolanda Madrid Morales and Peter Andrew Guarnero. “Non-Suicidal Self-Injury among Adult Males in a Correctional Setting”. In: *Issues in Mental Health Nursing* 35.8 (Aug. 2014), pp. 628–634. ISSN: 1096-4673. DOI: 10.3109/01612840.2014.927943.

[23] UNHCR. *UNHCR: A Record 100 Million People Forcibly Displaced Worldwide — UN News*. https://news.un.org/en/story/2022/05/1118772. May 2022. (Visited on 10/29/2024).

[24] UNHCR. *Convention and Protocol Relating to the Status of Refugees*. https://www.unhcr.org/media/convention-and-protocol-relating-status-refugees. 2010. (Visited on 10/29/2024).

[25] Amnesty International. *Refugees, Asylum Seekers and Migrants - Amnesty International*. https://www.amnesty.org/en/what-we-do/refugees-asylum-seekers-and-migrants/. 2024. (Visited on 10/29/2024).

[26] Harmit Athwal. “‘I Don’t Have a Life to Live’: Deaths and UK Detention”. In: *Race & Class* 56.3 (Jan. 2015), pp. 50–68. ISSN: 0306-3968. DOI: 10.1177/0306396814556224. (Visited on 10/29/2024).

[27] Maria Sundvall et al. “Assessment and Treatment of Asylum Seekers after a Suicide Attempt: A Comparative Study of People Registered at Mental Health Services in a Swedish Location”. In: *BMC Psychiatry* 15.1 (Dec. 2015), p. 235. ISSN: 1471-244X. DOI: 10.1186/s12888-015-0613-8. (Visited on 10/29/2024).

[28] Angela Nickerson et al. “The Association between Visa Insecurity and Mental Health, Disability and Social Engagement in Refugees Living in Australia”. In: *European Journal of Psychotraumatology* (Dec. 2019). ISSN: 2000-8198. (Visited on 10/29/2024).

[29] Francesco Bevione et al. “Risk of Suicide and Suicidal Behavior in Refugees. A Meta-Review of Current Systematic Reviews and Meta-Analyses”. In: *Journal of Psychiatric Research* 177 (Sept. 2024), pp. 287–298. ISSN: 0022-3956. DOI: 10.1016/j.jpsychires.2024.07.024. (Visited on 10/29/2024).

[30] M. von Werthern et al. “The Impact of Immigration Detention on Mental Health: A Systematic Review”. In: *BMC Psychiatry* 18.1 (Dec. 2018), p. 382. ISSN: 1471-244X. DOI: 10.1186/s12888-018-1945-y. (Visited on 10/29/2024).

[31] Kyli Hedrick et al. “Self-Harm in the Australian Asylum Seeker Population: A National Records-Based Study”. In: *SSM - Population Health* 8 (Aug. 2019), p. 100452. ISSN: 23528273. DOI: 10.1016/j.ssmph.2019.100452. (Visited on 10/29/2024).

[32] Global Detention Project. *United Kingdom Immigration Detention Profile*. https://www.globaldetentionproject.org/countries/europe/united-kingdom. 2024. (Visited on 11/02/2024).

[33] Vladeta Ajdacic-Gross et al. “Methods of Suicide: International Suicide Patterns Derived from the WHO Mortality Database”. In: *Bulletin of the World Health Organi-*

zation 86.9 (June 2008), p. 726. DOI: 10.2471/BLT.07.043489. (Visited on 10/29/2024).

[34] Dinesh Bhugra, Thomas K. J. Craig, and Kamaldeep Bhui. *Mental Health of Refugees and Asylum Seekers*. OUP Oxford, Aug. 2010. ISBN: 978-0-19-955722-6.

[35] Elisa Haase et al. "Prevalence of Suicidal Ideation and Suicide Attempts among Refugees: A Meta-Analysis". In: *BMC Public Health* 22.1 (Apr. 2022), p. 635. ISSN: 1471-2458. DOI: 10.1186/s12889-022-13029-8. (Visited on 10/29/2024).

[36] Kyli Hedrick and Rohan Borschmann. "Self-Harm among Unaccompanied Asylum Seekers and Refugee Minors: Protocol for a Global Systematic Review of Prevalence, Methods and Characteristics". In: *BMJ Open* 13.6 (June 2023), e069237. ISSN: 2044-6055, 2044-6055. DOI: 10.1136/bmjopen-2022-069237. (Visited on 10/29/2024).

[37] Raffaela Puggioni. "Speaking through the Body: Detention and Bodily Resistance in Italy". In: *Citizenship Studies* 18.5 (July 2014), pp. 562–577. ISSN: 1362-1025. DOI: 10.1080/13621025.2014.923707. (Visited on 10/29/2024).

[38] Firas Shaker Mahmoud Al-Faham and Samer Makki Mohamed Al-Hakkak. "The Largest Esophageal Foreign Body in Adults: A Case Report". In: *Annals of Medicine and Surgery (2012)* 54 (June 2020), pp. 82–84. ISSN: 2049-0801. DOI: 10.1016/j.amsu.2020.04.039.

[39] Ioannis Pantazopoulos et al. "Intentional Ingestion of Batteries and Razor Blades by a Prisoner: A True Emergency?" In: *International Journal of Prisoner Health* 18.3 (2022), pp. 316–322. ISSN: 1744-9200. DOI: 10.1108/IJPH-06-2021-0054.

[40] Guy Aitchison and Ryan Essex. "Self-Harm in Immigration Detention: Political, Not (Just) Medical". In: *Journal of Medical Ethics* 50.11 (Nov. 2024), pp. 786–793. ISSN: 0306-6800, 1473-4257. DOI: 10.1136/jme-2022-108366. (Visited on 10/29/2024).

[41] Matthew J Page et al. "The PRISMA 2020 Statement: An Updated Guideline for Reporting Systematic Reviews". In: *BMJ* (Mar. 2021), n71. ISSN: 1756-1833. DOI: 10.1136/bmj.n71. (Visited on 12/10/2024).

[42] The Pandas Development Team. *Pandas-Dev/Pandas: Pandas*. Zenodo. Mar. 2020. DOI: 10.5281/zenodo.13819579. (Visited on 04/03/2025).

[43] Fabian Pedregosa et al. "Scikit-Learn: Machine Learning in Python". In: *Journal of Machine Learning Research* 12.85 (2011), pp. 2825–2830. ISSN: 1533-7928. (Visited on 04/04/2025).

[44] Microsoft Corporation. *Microsoft Excel*. 2025.

[45] S Moola et al. "Chapter 7: Systematic Reviews of Etiology and Risk". In: *JBI Manual for Evidence Synthesis*. JBI, 2020. ISBN: 978-0-648-84880-6. DOI: 10.46658/JBIMES-20-08. (Visited on 05/07/2025).

[46] D Stillman et al. *Zotero*. Corporation for Digital Scholarship. Vienna, VA, USA, May 2025.

[47] Seval Akay et al. "A Deliberately Swallowed Foreign Body: Money Package". In: *Endoscopy* (2015). DOI: 10.1055/s-0035-1569668.

[48] Firas Shaker Mahmoud Al-Faham and Samer Makki Mohamed Al-Hakkak. "The Largest Esophageal Foreign Body In Adults: A Case Report". In: *Annals Of Medicine And Surgery (2012)* (2020). DOI: 10.1016/j.amsu.2020.04.039.

[49] Ahmed M. AlMuhsin et al. "Surgical Management of Massive Metal Bezoar". In: *Cureus* 13.1 (Jan. 2021). ISSN: 2168-8184. DOI: 10.7759/cureus.12597. (Visited on 03/30/2025).

[50] Raya Al Shaaibi and Ibrahim Al Waili. "Laparoscopic Retrieval Of Ingested Foreign Body". In: *Oman Medical Journal* (2021). DOI: 10.5001/omj.2021.35.

[51] A. O. Alao and B. Abraham. "Foreign Body Ingestions In A Schizophrenic Patient". In: *West African Journal Of Medicine* (2006). DOI: 10.4314/wajm.v25i3.28286.

[52] Mazen Albeldawi and Sigurbjorn Birgisson. "Conservative Management of Razor Blade Ingestion". In: *Gastroenterology Report* 2.2 (May 2014), pp. 158–159. ISSN: 2052-0034. DOI: 10.1093/gastro/gou002. (Visited on 04/14/2025).

[53] Syed Muhammad Ali. "Duodenal Perforation by Swallowed Toothbrush: Case Report and Review of Literature". In: *Open Access Journal of Surgery* 4.2 (May 2017). ISSN: 24761346. DOI: 10.19080/OAJS.2017.04.555632. (Visited on 04/14/2025).

[54] Alaa Ali and Saeed Alhindi. "A Child With A Gastrocolic Fistula After Ingesting Magnets: An Unusual Complication". In: *Cureus* (2020). DOI: 10.7759/cureus.9336.

[55] Ahmed Ali et al. "Endoscopic Retrieval Of An Ingested Mobile Phone From The Stomach Of A Prisoner: When Gastroenterologists Answer The Call". In: *Cureus* (2022). DOI: 10.7759/cureus.33053.

[56] Madhur Anand et al. "Doormatobezoar: First Case Report of a Bezoar Formed by Doormat Ingestion". In: *International Surgery Journal* 10.4 (Mar. 2023), pp. 776–778. ISSN: 2349-2902, 2349-3305. DOI: 10.18203/2349-2902.isj20230996. (Visited on 04/14/2025).

[57] Sharie Apikotoa, Helen Ballal, and Ruwan Wijesuriya. "Endoscopic Foreign Body Retrieval From The Caecum - A Case Report And Push For Intervention Guidelines". In: *International Journal Of Surgery Case Reports* (2022). DOI: 10.1016/j.ijscr.2022.106755.

[58] A. Ataya, A.H. Alraiyes, and M.C. Alraies. "Razor Blades in the Stomach". In: *QJM: An International Journal of Medicine* 106.8 (Aug. 2013), pp. 783–784. ISSN: 1460-2725. DOI: 10.1093/qjmed/hcs165. (Visited on 04/14/2025).

[59] Yahya Atayan et al. "Lighter Ingestion as an Uncommon Cause of Severe Vomiting in a Schizophrenia Patient". In: *Case Reports in Gastrointestinal Medicine* 2016 (2016), p. 6301302. ISSN: 2090-6528. DOI: 10.1155/2016/6301302.

[60] Dileep Atluri et al. "Recurrent Intentional Foreign Body Ingestion: An Endoscopist's Dilemma". In: *Gastroenterology & Hepatology* 8.7 (July 2012), pp. 482–484. ISSN: 1554-7914.

[61] Auriel August and Claudia Mueller. "Early Recognition Is Important When Multiple Magnets Masquerade as a Single Chain after Foreign Body Ingestion". In: *Journal of Pediatric Surgery Case Reports* 13 (Oct. 2016), pp. 8–9. ISSN: 2213-5766. DOI: 10.1016/j.epsc.2016.07.006. (Visited on 04/14/2025).

[62] N. Beecroft et al. “An Unusual Case of Pica”. In: *International Journal of Geriatric Psychiatry* 13.9 (Sept. 1998), pp. 638–641. ISSN: 0885-6230. DOI: 10.1002/(sici)1099-1166(199809)13:9⟨638::aid-gps837⟩3.0.co;2-n.

[63] Lbl Benoist et al. “A Jackass And A Fish: A Case Of Life-Threatening Intentional Ingestion Of A Live Pet Catfish Corydoras Aeneus”. In: *Acta Oto-Laryngologica Case Reports* (2019). DOI: 10.1080/23772484.2018.1555436.

[64] P Berry and S Kotha. “Crying Wolf: The Danger Of Recurrent Intentional Foreign Body Ingestion”. In: *Frontline Gastroenterology* (2021). DOI: 10.1136/flgastro-2021-101888.

[65] Sanjay K. Bhasin et al. “7” Long Knife for 7 Years in the Duodenum: A Rare Case Report and Review of Literature”. In: *International Surgery Journal* 1.1 (2014), pp. 29–32. ISSN: 2349-2902. (Visited on 04/14/2025).

[66] Prosanta Bhattacharjee and Om Singh. “Repeated Ingestion of Sharp-Pointed Metallic Objects”. In: *Archives of Iranian medicine* 11 (Oct. 2008), pp. 563–5.

[67] Sriya Bhumi et al. “Esophageal Button Battery Retrieval: Time-In May Not Be Everything”. In: *Cureus* (2024). DOI: 10.7759/cureus.58327.

[68] May Bisharat et al. “Foreign Body Ingestion in Prisoners - the Belfast Experience”. In: *The Ulster Medical Journal* 77.2 (May 2008), pp. 110–114. ISSN: 0041-6193.

[69] Ramin Bozorgmehr et al. “A Rare Case Of Abdominal Foreign Bodies; Laparoscopic Removal Of A Sewing Needle”. In: *Annals Of Medicine And Surgery (2012)* (2022). DOI: 10.1016/j.amsu.2022.104747.

[70] Daniel J. Brown. “Small Bowel Perforation Caused by Multiple Magnet Ingestion”. In: *The Journal of Emergency Medicine* 39.4 (Oct. 2010), pp. 497–498. ISSN: 0736-4679. DOI: 10.1016/j.jemermed.2008.04.007.

[71] Cristina Camacho Dorado et al. “Metallic bezoar after suicide attempt”. In: *Cirugia Espanola* 96.8 (Oct. 2018), p. 515. ISSN: 2173-5077. DOI: 10.1016/j.ciresp.2018.02.015.

[72] Brandon M. Carius, P. M. Dodge, and Brit Long. “Sharp Object In The Belly: A Case Of Pediatric Intentional Razor Blade Ingestion In The Emergency Department”. In: *Cureus* (2020). DOI: 10.7759/cureus.7699.

[73] J. A. Cauchi and R. N. Shawis. “Multiple Magnet Ingestion and Gastrointestinal Morbidity”. In: *Archives of Disease in Childhood* 87.6 (Dec. 2002), pp. 539–540. ISSN: 1468-2044. DOI: 10.1136/adc.87.6.539.

[74] Elias Chahine et al. “Recurrent Gastric Metal Bezoar: A Rare Cause of Gastric Outlet Obstruction”. In: *Case Reports* 2017 (Sept. 2017), bcr. ISSN: 1757-790X. DOI: 10.1136/bcr-2017-221928. (Visited on 04/14/2025).

[75] Wen-Jung Chang and Wen-Yi Chiu. “Gastric Foreign Body: A Comb”. In: *Clinical Case Reports* (2017). DOI: 10.1002/ccr3.957.

[76] Ashish Chauhan et al. “Intentional Ingestion Of A Foreign Body - Why We Need Psychiatrists”. In: *Middle East Journal Of Digestive Diseases* (2023). DOI: 10.34172/mejdd.2023.321.

[77] A. N. Colapkulu et al. “Chronic Foreign Body Ingestion In Two Adults With Psychiatric Disorder: Is It Possible To Wait And See? Foreign Body Ingestion”. In: *Annals Of Clinical And Analytical Medicine* (2024). DOI: 10.4328/acam.22190.

[78] David Cox, Peter Donohue, and Vanda Costa. “A Swallowed Toothbrush Causing Perforation 2 Years after Ingestion”. In: *British Journal of Hospital Medicine (London, England: 2005)* 68.10 (Oct. 2007), p. 559. ISSN: 1750-8460. DOI: 10.12968/hmed.2007.68.10.27330.

[79] G Csaky et al. “Laparoscopic Removal Of A Foreign Body From The Jejunum”. In: *Surgical Laparoscopy & Endoscopy* (1998). DOI: 10.1097/00019509-199802000-00016.

[80] Jason Cui, Trent Cross, and David Lockwood. “Ingested Razor Blades within the Appendix: A Rare Case Report”. In: *International Journal of Surgery Case Reports* 45 (Jan. 2018), pp. 29–32. ISSN: 2210-2612. DOI: 10.1016/j.ijscr.2018.03.018. (Visited on 04/14/2025).

[81] Siddharth Sankar Das et al. “Intentional Ingestion Of Foreign Bodies: A Physician’S Agony”. In: *Cureus* (2023). DOI: 10.7759/cureus.37677.

[82] Jhony Alejandro Delgado Salazar et al. “Ingestion of Razor Blades, a Rare Event: A Case Report in a Psychiatric Patient”. In: *Journal of Surgical Case Reports* 2020.5 (May 2020), rjaa094. ISSN: 2042-8812. DOI: 10.1093/jscr/rjaa094. (Visited on 04/14/2025).

[83] J. Devanesan et al. “Metallic Foreign Bodies in the Stomach”. In: *Archives of Surgery (Chicago, Ill.: 1960)* 112.5 (May 1977), pp. 664–665. ISSN: 0004-0010. DOI: 10.1001/archsurg.1977.01370050124025.

[84] Jacob T. Dines and Amie Harvey. “Chronic Intentional Chicken Bone Ingestion Mimicking Inflammatory Bowel Disease”. In: *Bmj Case Reports* (2021). DOI: 10.1136/bcr-2020-239022.

[85] J Dipoce, M Guelfguat, and J Dipoce. “Radiologic Findings In Cases Of Attempted Suicide And Other Self-Injurious Behavior”. In: *Radiographics* (2012). DOI: 10.1148/rg.327125035.

[86] Divsalar P., Mousa S.H., and Abbasi M.H. “Repeated Intentional Swallowing Of Foreign Objects By An Adolescent Girl Case Report”. In: *International Journal Of High Risk Behaviors And Addiction* (2023). DOI: 10.5812/ijhrba-134720.

[87] Sabina Dranova et al. “Difficult Oesophageal Foreign Body Removal: A Novel Surgical Approach To A Complex Situation”. In: *Journal Of Laryngology And Otology* (2024). DOI: 10.1017/s0022215124000033.

[88] Noel I. Dumaguing et al. “Pica in the Geriatric Mentally Ill: Unrelenting and Potentially Fatal”. In: *Journal of Geriatric Psychiatry and Neurology* 16.3 (Sept. 2003), pp. 189–191. ISSN: 0891-9887. DOI: 10.1177/0891988703256049.

[89] Louise Dunphy et al. “Ingested Cylindrical Batteries In An Incarcerated Male: A Caustic Tale!” In: *Bmj Case Reports* (2015). DOI: 10.1136/bcr-2014-208922.

[90] Mohammad Ali Emamhadi et al. “Sudden Death Following Oral Intake of Metal Objects (Acuphagia): A Case Report”. In: *Emergency (Tehran, Iran)* 6.1 (2018), e16. ISSN: 2345-4563.

[91] Farbod Farhadi et al. “This Is a Successful Removal of More than 450 Pieces of Metal Objects from a Patient’s Stomach: A Case Report”. In: *Journal of Medical Case*

Reports 18.1 (Aug. 2024), p. 381. ISSN: 1752-1947. DOI: 10.1186/s13256-024-04672-3.

[92] Stephen J. Fenton et al. "Magnetic Attraction Leading to a Small Bowel Obstruction in a Child". In: *Pediatric Surgery International* 23.12 (Dec. 2007), pp. 1245–1247. ISSN: 0179-0358. DOI: 10.1007/s00383-007-1997-4.

[93] Sean Fine, James B. Watson, and Fadlallah Habr. "Now You See It, Endo You Don't: Case of the Disappearing Knife". In: *Gastroenterology* 144.7 (June 2013), e6–e7. ISSN: 0016-5085, 1528-0012. DOI: 10.1053/j.gastro.2013.01.059. (Visited on 04/14/2025).

[94] Emily Fry and Francis L. Counselman. "A Right Scrotal Abscess and Foreign Body Ingestion in a Schizophrenic Patient". In: *The Journal of Emergency Medicine* 38.5 (June 2010), pp. 587–592. ISSN: 0736-4679. DOI: 10.1016/j.jemermed.2007.07.018.

[95] Andrew W. Gardner et al. "Double Duodenal Perforation Following Foreign Body Ingestion". In: *Bmj Case Reports* (2017). DOI: 10.1136/bcr-2017-223182.

[96] Gary G. Ghahremani and Katherine M. Richman. "Accidental Or Intentional Ingestion Of Toothbrushes: Experience With 8 Adult Patients". In: *Emergency Radiology* (2022). DOI: 10.1007/s10140-021-02009-x.

[97] Subash Ghimire et al. "Repetitive Sharps Ingestion And Challenges With Retrieval And Prevention". In: *European Journal Of Case Reports In Internal Medicine* (2020). DOI: 10.12890/2020_001824.

[98] R. D. Goldman et al. "A Bizarre Bezoar: Case Report And Review Of The Literature". In: *Pediatric Surgery International* (1998). DOI: 10.1007/s003830050492.

[99] Narasimha Swamy Gollol-Raju et al. "Nonsurgical Management of an Embedded Metal Clip in Sigmoid Colon Causing Perforation and Abscess". In: *ACG Case Reports Journal* 6.4 (Apr. 2019), e00032. ISSN: 2326-3253. DOI: 10.14309/crj.0000000000000032. (Visited on 04/14/2025).

[100] John C. Hardy et al. "Loose Screws: Removal of Foreign Bodies From the Lower Gastrointestinal Tract". In: *Cureus* 15.8 (Aug. 2023). ISSN: 2168-8184. DOI: 10.7759/cureus.43093. (Visited on 03/30/2025).

[101] Patricia V. Hernandez et al. "Removal Of A Large Stone In The Upper Thoracic Esophagus". In: *Mayo Clinic Proceedings. Innovations, Quality & Outcomes* (2020). DOI: 10.1016/j.mayocpiqo.2019.10.005.

[102] Nick Hindley et al. "The Management of Cylindrical Battery Ingestion in Psychiatric Settings". In: *Psychiatric Bulletin* 23.4 (Apr. 1999), pp. 224–226. ISSN: 0955-6036, 1472-1473. DOI: 10.1192/pb.23.4.224. (Visited on 04/14/2025).

[103] Ian Hunt et al. "Aortoesophageal Perforation Following Ingestion Of Razorblades With Massive Haemothorax". In: *European Journal Of Cardio-Thoracic Surgery : Official Journal Of The European Association For Cardio-Thoracic Surgery* (2007). DOI: 10.1016/j.ejcts.2007.01.073.

[104] Sameer R. Islam et al. "Endoscopic Removal Of Multiple Duodenum Foreign Bodies: An Unusual Occurrence". In: *World Journal Of Gastrointestinal Endoscopy* (2010). DOI: 10.4253/wjge.v2.i5.186.

[105] A. H. James and T. G. Allen-Mersh. "Recognition and Management of Patients Who Repeatedly Swallow Foreign Bodies". In: *Journal of the Royal Society of Medicine* 75.2 (Feb. 1982), pp. 107–110. ISSN: 0141-0768. DOI: 10.1177/014107688207500207.

[106] Maham Jehangir, Christopher Mallory, and Jonathan R. Medverd. "Digital Tomosynthesis For Detection Of Ingested Foreign Objects In The Emergency Department: A Case Of Razor Blade Ingestion". In: *Emergency Radiology* (2019). DOI: 10.1007/s10140-018-01664-x.

[107] Shengjian Jin et al. "Metallic Foreign Bodies Ingestion by Schizophrenic Patient: A Case Report". In: *Annals of Medicine and Surgery* 85.4 (Apr. 2023), p. 1270. ISSN: 2049-0801. DOI: 10.1097/MS9.0000000000000497. (Visited on 03/30/2025).

[108] Wilbur E. Johnson. "On Ingestion of Razor Blades". In: *JAMA* 208.11 (June 1969), p. 2163. ISSN: 0098-7484. DOI: 10.1001/jama.1969.03160110135030. (Visited on 04/14/2025).

[109] I. Kamal, J. Thompson, and D. M. Paquette. "The Hazards of Vinyl Glove Ingestion in the Mentally Retarded Patient with Pica: New Implications for Surgical Management". In: *Canadian Journal of Surgery. Journal Canadien De Chirurgie* 42.3 (June 1999), pp. 201–204. ISSN: 0008-428X.

[110] Cml Kapalu et al. "Pediatric Recurrent Intentional Foreign Body Ingestion: Case Series And Review Of The Literature". In: *Journal Of Pediatric Gastroenterology And Nutrition* (2020). DOI: 10.1097/mpg.0000000000002757.

[111] Sujita Kumar Kar, Abhilove Kamboj, and Rajesh Kumar. "Pica and Psychosis - Clinical Attributes and Correlations: A Case Report". In: *Journal of Family Medicine and Primary Care* 4.1 (2015), pp. 149–150. ISSN: 2249-4863. DOI: 10.4103/2249-4863.152277.

[112] P. L. Kariholu et al. "Pica - a Case of Acuphagia or Hyalophagia?" In: *The Indian Journal of Surgery* 70.3 (June 2008), pp. 144–146. ISSN: 0972-2068. DOI: 10.1007/s12262-008-0040-x.

[113] T Ken, Y Sunichi, and U Toshiro. "Endoscopic Removal Of Foreign Bodies In The Mentally And Physically Handicapped". In: *Chinese Medical ...* (1993). DOI: 10.5555/cmj.0366-6999.106.10.p788.01.

[114] T Kerestes and J Smith. "Paper or Plastic? A Foreign Body Ingestion Leading to Small Bowel Obstruction. A Case Report". In: *ARC Journal of Clinical Case Reports* 5.2 (2019). ISSN: 24559806. DOI: 10.20431/2455-9806.0502002. (Visited on 04/14/2025).

[115] Audra L. King, David R. Velez, and Mentor Ahmeti. "Surgical Management of an Intentionally Ingested Vape Device Chronically Impacted within the Duodenum of an Adult Male". In: *Cureus* 15.5 (May 2023), e39448. ISSN: 2168-8184. DOI: 10.7759/cureus.39448.

[116] Jarek Kobiela et al. "Vast Collection of Foreign Bodies in the Stomach Presenting as Acute Gastrointestinal Bleeding in a Patient with Schizophrenia". In: *Endoscopy* 47.S 01 (July 2015), E356–E357. ISSN: 0013-726X, 1438-8812. DOI: 10.1055/s-0034-1392611. (Visited on 04/14/2025).

[117] A. Kumar and A. R. Jazieh. "Case Report of Sideroblastic Anemia Caused by Ingestion of Coins". In: *American*

Journal of Hematology 66.2 (Feb. 2001), pp. 126–129. ISSN: 0361-8609. DOI: 10.1002/1096-8652(200102)66:2⟨126::AID-AJH1029⟩3.0.CO;2-J.

[118] Gupta Suresh Kumar et al. "Bizarre Metal Bezoar: A Case Report". In: *Indian Journal of Surgery* 75.1 (June 2013), pp. 356–358. ISSN: 0973-9793. DOI: 10.1007/s12262-012-0706-2. (Visited on 04/14/2025).

[119] Ranesh Kumar et al. "Intentional Foreign Body Ingestion". In: *Internal And Emergency Medicine* (2019). DOI: 10.1007/s11739-019-02183-4.

[120] Michael J. Lai et al. "An Unusually Large Object Removed From The Upper Esophagus In A Patient With Self Harm Syndrome". In: *Ear, Nose, & Throat Journal* (2022). DOI: 10.1177/0145561320953707.

[121] Min-Ro Lee, Yong Hwang, and Jong-Hun Kim. "A Case of Colohepatic Penetration by a Swallowed Toothbrush". In: *World Journal of Gastroenterology* 12.15 (Apr. 2006), pp. 2464–2465. ISSN: 1007-9327. DOI: 10.3748/wjg.v12.i15.2464.

[122] Jun Hyung Lee et al. "What Is The Role Of Plain Radiography In Patients With Foreign Bodies In The Gastrointestinal Tract?" In: *Clinical Imaging* (2012). DOI: 10.1016/j.clinimag.2011.11.017.

[123] Quan-Peng Li et al. "Endoscopic Retrieval of 28 Foreign Bodies in a 100-Year-Old Female after Attempted Suicide". In: *World Journal of Gastroenterology* 19.25 (July 2013), pp. 4091–4093. ISSN: 2219-2840. DOI: 10.3748/wjg.v19.i25.4091.

[124] Xp Li et al. "Intestinal Perforation By Ingested Foreign Bodies". In: *International Surgery* (2021). DOI: 10.9738/intsurg-d-15-00303.1.

[125] Steven Liu et al. "Magnetic Foreign Body Ingestions Leading to Duodenocolonic Fistula". In: *Journal of Pediatric Gastroenterology and Nutrition* 41.5 (Nov. 2005), pp. 670–672. ISSN: 0277-2116. DOI: 10.1097/01.mpg.0000177703.99786.c9.

[126] J. E. Losanoff and K. T. Kjossev. "Gastrointestinal 'Crosses'. A New Shade from an Old Palette." In: *Archives of surgery (Chicago, Ill. : 1960)* 131.2 (Feb. 1996), pp. 166–169. ISSN: 0004-0010. DOI: 10.1001/archsurg.1996.01430140056015.

[127] Cheng-Jen Ma et al. "Successful Localization and Surgical Removal of Ingested Sewing Needles under Mini C-arm Fluoroscopy: A Case Report". In: *The Kaohsiung Journal of Medical Sciences* 22.9 (Sept. 2006), pp. 457–460. ISSN: 1607-551X. DOI: 10.1016/S1607-551X(09)70338-9.

[128] Haitham Mazek et al. "An Unusual Number of Self-ingested Foreign Bodies". In: *The American Journal of the Medical Sciences* 352.3 (Sept. 2016), pp. 324–325. ISSN: 1538-2990. DOI: 10.1016/j.amjms.2016.05.022.

[129] Telila Mesfin et al. "Ingestion of Metallic Materials Found in the Stomach and First Part of the Duodenum of a Schizophrenic Man: Case Report". In: *International Medical Case Reports Journal* 15 (2022), pp. 681–684. ISSN: 1179-142X. DOI: 10.2147/IMCRJ.S386883.

[130] S. Misra et al. "Metallic Sewing Needle Ingestion Presenting as Acute Abdomen". In: *Nigerian Journal of Clinical Practice* 16.4 (2013), pp. 540–543. ISSN: 1119-3077. DOI: 10.4103/1119-3077.116879.

[131] Ayad Ahmad Mohammed. "Ingestion of Huge Number of Metallic Nails Impacted in the Stomach and Cecum in a Mentally Abnormal Woman: Case Report". In: *International Journal of Surgery Case Reports* 70 (2020), pp. 60–63. ISSN: 2210-2612. DOI: 10.1016/j.ijscr.2020.04.019.

[132] Hirikati S. Nagaraj and Indira Sunil. "Multiple Foreign Body Ingestion and Ileal Perforation". In: *Pediatric Surgery International* 21.9 (Sept. 2005), pp. 718–720. ISSN: 0179-0358. DOI: 10.1007/s00383-005-1422-9.

[133] Hussein Naji et al. "Bowel Injuries Caused By Ingestion Of Multiple Magnets In Children: A Growing Hazard". In: *Pediatric Surgery International* (2012). DOI: 10.1007/s00383-011-3026-x.

[134] N Saleem Nh Senussi. "Ingestion Of Computer Circuit Boards Causing Esophageal Impaction And Small Bowel Obstruction". In: *Baylor University Medical Center ...* (2017). DOI: 10.1080/08998280.2017.11929541.

[135] Obinna Obinwa, David Cooper, and James M. O'Riordan. "An Ingested Mobile Phone in the Stomach May Not Be Amenable to Safe Endoscopic Removal Using Current Therapeutic Devices: A Case Report". In: *International Journal of Surgery Case Reports* 22 (Jan. 2016), pp. 86–89. ISSN: 2210-2612. DOI: 10.1016/j.ijscr.2016.03.043. (Visited on 04/14/2025).

[136] Alan E. Oestreich. "Multiple Magnet Ingestion Alert". In: *Radiology* 233.2 (Nov. 2004), p. 615. ISSN: 0033-8419. DOI: 10.1148/radiol.2332041446.

[137] Yasuharu Ohno et al. "Gastroduodenal Fistula Caused by Ingested Magnets". In: *Gastrointestinal Endoscopy* 61.1 (Jan. 2005), pp. 109–110. ISSN: 0016-5107. DOI: 10.1016/s0016-5107(04)02387-9.

[138] A. Peixoto, P. Pereira, and G. Macedo. "Gastrointestinal: Voluntary Padlock Ingestion". In: *Journal Of Gastroenterology And Hepatology* (2017). DOI: 10.1111/jgh.13828.

[139] Serena T. Pham, Osamu Sakai, and V. Carlota Andreu-Arasa. "Imaging Approach To Ingested Foreign Bodies In The Neck". In: *Neuroradiology* (2024). DOI: 10.1007/s00234-024-03348-5.

[140] Manuel Rodrigo Prieto-Aldape et al. "Relapsing Massive Metal Bezoar: A Case Report". In: *Journal of Medical Case Reports* 3.1 (Feb. 2009), p. 56. ISSN: 1752-1947. DOI: 10.1186/1752-1947-3-56. (Visited on 04/14/2025).

[141] Nafees Ahmad Qureshi et al. "Endoscopic Retrieval of an Intentionally Ingested Mobile Phone in an Adult: First Case Report of Its Kind". In: *Annals of Clinical Case Reports* 1 (2016).

[142] Amin Rezazadeh et al. "Removing 216 Sharp Metal Foreign Objects from the Digestive Tract of a 30-Year-Old Male: Case Report". In: *Annals of Medicine and Surgery (2012)* 85.9 (Sept. 2023), pp. 4553–4560. ISSN: 2049-0801. DOI: 10.1097/MS9.0000000000000377.

[143] Carlo Galdino Riva et al. "Unusual Foreign Body Impacted In The Upper Oesophagus: Original Technique For Transoral Extraction". In: *Bmj Case Reports* (2018). DOI: 10.1136/bcr-2018-225241.

[144] G D Roark, K Subramanyam, and M Patterson. "Ingested Foreign Material in Mentally Disturbed Patients". In: *Southern medical journal* 76.9 (Sept. 1983), pp. 1125–

1127. ISSN: 1541-8243. DOI: 10.1097/00007611-198309000-00015. (Visited on 04/10/2025).

[145] Atif Saeed et al. "Attraction Problems Following Magnet Ingestion". In: *Annals of the Royal College of Surgeons of England* 91.5 (July 2009), W10–12. ISSN: 1478-7083. DOI: 10.1308/147870809X450566.

[146] Timothy Sakellaridis et al. "An Unusual Case Of A Swallowed Thermometer Perforated In The Mediastinum". In: *Annals Of Thoracic Surgery* (2008). DOI: 10.1016/j.athoracsur.2007.07.027.

[147] Steven Schierling et al. "Magnet Ingestion". In: *The Journal of Pediatrics* 152.2 (Feb. 2008), pp. 294–294. ISSN: 1097-6833. DOI: 10.1016/j.jpeds.2007.08.042.

[148] J Sharma, S Riyaz, and Wj Kilpatrick. "Multi-Disciplinary Approach To Managing Deliberate Foreign Body Ingestion On The Medical Floor". In: *Journal Of The Academy Of Consultation-Liaison Psychiatry* (2022). DOI: 10.1016/j.jaclp.2022.10.025.

[149] Zaka Ur Rab Siddiqui. "Metal Bezoars Causing Upper Gastrointestinal Obstruction in a Schizophrenic". In: *APSP journal of case reports* 2.2 (May 2011), p. 14. ISSN: 2218-8185.

[150] Sanju Sobnach et al. "Penetrating Cardiac Injury Following Sewing Needle Ingestion". In: *Heart, Lung & Circulation* (2011). DOI: 10.1016/j.hlc.2011.01.006.

[151] Noran Sultan et al. "A Plastic Bezoar Causing Bowel Obstruction: A Case Of Table Cover Ingestion". In: *International Journal Of Surgery Case Reports* (2024). DOI: 10.1016/j.ijscr.2024.109506.

[152] V. S. Tammana, N. Valluru, and A. Sanderson. "All The Wrong Places: An Unusual Case Of Foreign Body Ingestion And Inhalation". In: *Case Reports In Gastroenterology* (2012). DOI: 10.1159/000346287.

[153] Y Tanrikulu et al. "Ingestion Of Multiple Magnets For Suicide". In: *Hong Kong Journal Of Emergency Medicine* (2015). DOI: 10.1177/102490791502200107.

[154] Mehdi Tavallaei, Mahsa Bahadorinia, and Arsh Haj Mohamad Ebrahim Ketabforoush. "Intentional Ingestion Of A Metallic Wire Causing Perforation And Retroperitoneal Abscess: A Case Report". In: *Clinical Medicine Insights. Case Reports* (2021). DOI: 10.1177/11795476211025919.

[155] Ee Tein Tay, Gerard Weinberg, and Terry L. Levin. "Ingested Magnets: The Force Within". In: *Pediatric Emergency Care* 20.7 (July 2004), pp. 466–467. ISSN: 1535-1815. DOI: 10.1097/01.pec.0000134926.03030.a7.

[156] Niresh Thapa, Subi Basnyat, and Muna Maharjan. "Ingestion Of Bell Clappers By A Shaman In Jumla, Nepal: A Case Report". In: *Jnma; Journal Of The Nepal Medical Association* (2019). DOI: 10.31729/jnma.4055.

[157] Gorana Trgo et al. "Successful Endoscopic Removal Of A Lighter Swallowed 17 Months Before". In: *Case Reports In Gastroenterology* (2012). DOI: 10.1159/000338839.

[158] B. C. Tsui and J. Mossey. "Occult Liver Abscess Following Clinically Unsuspected Ingestion of Foreign Bodies". In: *Canadian Journal of Gastroenterology = Journal Canadien De Gastroenterologie* 11.5 (1997), pp. 445–448. ISSN: 0835-7900. DOI: 10.1155/1997/815876.

[159] J. P. Tupesis et al. "A Penny For Your Thoughts: Small Bowel Obstruction Secondary To Coin Ingestion". In: *Journal Of Emergency Medicine* (2004). DOI: 10.1016/j.jemermed.2004.03.013.

[160] Chinelo Udemgba et al. "A Case Report Of An Unusual Left Atrial Mass". In: *European Heart Journal. Case Reports* (2021). DOI: 10.1093/ehjcr/ytaa500.

[161] Djokić Vesna et al. "Cardiac Tamponade Caused by Migration of a Swallowed Sewing Needle". In: *Forensic Science International* 139.2-3 (Jan. 2004), pp. 237–239. ISSN: 0379-0738. DOI: 10.1016/j.forsciint.2003.10.013.

[162] Viju Vijaysadan, Maria Perez, and David Kuo. "Revisiting Swallowed Troubles: Intestinal Complications Caused by Two Magnets—A Case Report, Review and Proposed Revision to the Algorithm for the Management of Foreign Body Ingestion". In: *The Journal of the American Board of Family Medicine* 19.5 (Sept. 2006), pp. 511–516. ISSN: 1557-2625, 1558-7118. DOI: 10.3122/jabfm.19.5.511. (Visited on 04/14/2025).

[163] C Wadhwa et al. "The Mule With Golden Eggs: Retrieval Of Unusual Foreign Body". In: *Journal Of Digestive Endoscopy* (2015). DOI: 10.4103/0976-5042.159247.

[164] Barbara E. Wildhaber, Claude Le Coultre, and Bernard Genin. "Ingestion of Magnets: Innocent in Solitude, Harmful in Groups". In: *Journal of Pediatric Surgery* 40.10 (Oct. 2005), e33–35. ISSN: 1531-5037. DOI: 10.1016/j.jpedsurg.2005.06.022.

[165] L. Witzel et al. "Removal of Razor Blades from Stomach with Fibreoptic Endoscope". In: *British Medical Journal* 2.5918 (June 1974), p. 539. ISSN: 0007-1447. DOI: 10.1136/bmj.2.5918.539.

[166] Bartosz Wnek, Aleksandra Łożyńska-Nelke, and Jacek Karoń. "Foreign Body In The Gastrointestinal Tract Leading To Small Bowel Obstruction–Case Report And Literature Review". In: *Polski Przeglad Chirurgiczny* (2015). DOI: 10.1515/pjs-2015-0006.

[167] Tyler D. Yan et al. "An Unusual Cause of Pericardial Effusion: A Case Report of a Hepatic Abscess Following Foreign Body Migration and Duodenal Perforation". In: *International Journal of Surgery Case Reports* 93 (Apr. 2022), p. 106931. ISSN: 2210-2612. DOI: 10.1016/j.ijscr.2022.106931. (Visited on 04/14/2025).

[168] Liu Yang and Wen Li. "Unusual Cervical Foreign Body - A Neglected Thermometer For 5 Years: A Case Report". In: *World Journal Of Clinical Cases* (2021). DOI: 10.12998/wjcc.v9.i30.9129.

[169] Zao M. Yang and Gregory N. Postma. "Unlocking Dysphagia: Intentional Ingestion Of Foreign Bodies". In: *Ear, Nose, & Throat Journal* (2022). DOI: 10.1177/0145561320937829.

[170] Malik Amjad Yasin et al. "Metal in Stomach: A Rare Cause of Gastric Bezoar". In: *BMJ Case Reports* 2009 (Feb. 2009), bcr06.2008.0278. ISSN: 1757-790X. DOI: 10.1136/bcr.06.2008.0278. (Visited on 04/14/2025).

[171] I Yildiz et al. "Tendency To Ingest Foreign Bodies In Mentally Retarded Patients: A Case With Ileal Perforation Caused By The Ingestion Of A Teaspoon". In: *Case Reports In Surgery* (2016). DOI: 10.1155/2016/8075432.

[172] Hong Yu et al. "Single-Incision Laparoscopic Surgery For Ingested Foreign Body Removal". In: *American Journal Of Emergency Medicine* (2014). DOI: 10.1016/j.ajem.2013.10.007.

[173] Gt Zhao et al. "Unexpected Death From Hepatic Abscess 16 Months After Toothbrush Ingestion". In: *Journal Of Forensic Sciences* (2022). DOI: 10.1111/1556-4029.15079.

[174] Fj Builes. "Repeated Behavior Of Deliberate Foreign Body Ingestion In A Patient With Psychiatric Disorder". In: *A Case Report. Clin Surg* (2024). DOI: 10.52916/jmrs244144.

[175] Sahli-Vivicorsi S. Marie A. Leclere J.-C. "A Dangerous Appetite". In: *European Annals Of Otorhinolaryngology, Head And Neck Diseases* (2024). DOI: 10.1016/j.anorl.2023.04.006.

[176] Bert T. te Wildt et al. "Swallowing Foreign Bodies as an Example of Impulse Control Disorder in a Patient With Intellectual Disabilities". In: *Psychiatry (Edgmont)* 7.9 (Sept. 2010), pp. 34–37. ISSN: 1550-5952. (Visited on 04/14/2025).

[177] A. Ashman, S. Bola, and A. Topiwala. "Managing Repeated Deliberate Foreign Body Ingestion". In: *British Journal Of Hospital Medicine (London, England : 2005)* (2019). DOI: 10.12968/hmed.2019.80.9.546.

[178] I Brezean et al. "Self-Harm In The Prison System". In: *Romanian Journal Of Legal Medicine* (2016). DOI: 10.4323/rjlm.2016.194.

[179] Giacomo Calini et al. "Endoscopic Failure for Foreign Body Ingestion and Food Bolus Impaction in the Upper Gastrointestinal Tract: An Updated Analysis in a European Tertiary Care Hospital". In: *European Journal of Gastroenterology & Hepatology* 35.9 (Sept. 2023), pp. 962–967. ISSN: 1473-5687. DOI: 10.1097/MEG.0000000000002602.

[180] Poorvi P. Dalal et al. "Intentional Foreign Object Ingestions: Need for Endoscopy and Surgery". In: *Journal of Surgical Research* 184.1 (Sept. 2013), pp. 145–149. ISSN: 00224804. DOI: 10.1016/j.jss.2013.04.078. (Visited on 09/25/2024).

[181] Mohamed amine Elghali et al. "The Management of Voluntary Ingestion of Razor Blades by Inmates". In: *International Surgery* 105.1-3 (Nov. 2016), pp. 129–133. ISSN: 0020-8868. DOI: 10.9738/INTSURG-D-16-00204.1. (Visited on 04/14/2025).

[182] Girolamo Geraci et al. "Retrospective Analysis of Management of Ingested Foreign Bodies and Food Impactions in Emergency Endoscopic Setting in Adults". In: *BMC emergency medicine* 16.1 (Nov. 2016), p. 42. ISSN: 1471-227X. DOI: 10.1186/s12873-016-0104-3.

[183] Brian K.P. Goh et al. "Perforation of the Gastrointestinal Tract Secondary to Ingestion of Foreign Bodies". In: *World Journal of Surgery* 30.3 (2006), p. 1658. ISSN: 1432-2323. DOI: 10.1007/s00268-005-0490-2. (Visited on 04/14/2025).

[184] C. Gracia, C. F. Frey, and B. I. Bodai. "Diagnosis and Management of Ingested Foreign Bodies: A Ten-Year Experience". In: *Annals of Emergency Medicine* 13.1 (Jan. 1984), pp. 30–34. ISSN: 0196-0644. DOI: 10.1016/s0196-0644(84)80380-7.

[185] Brian L. Huang et al. "Intentional Swallowing of Foreign Bodies Is a Recurrent and Costly Problem That Rarely Causes Endoscopy Complications". In: *Clinical Gastroenterology and Hepatology* 8.11 (Nov. 2010), pp. 941–946. ISSN: 1542-3565, 1542-7714. DOI: 10.1016/j.cgh.2010.07.013. (Visited on 04/14/2025).

[186] A Ishak et al. "Hard To Swallow, Hard To Treat". In: *British Journal Of Surgery* (2023). DOI: 10.1093/bjs/znad348.067.

[187] P. Kaazan et al. "Deliberate Foreign Body Ingestion In Patients With Underlying Mental Illness: A Retrospective Multicentre Study". In: *Australasian Psychiatry : Bulletin Of Royal Australian And New Zealand College Of Psychiatrists* (2023). DOI: 10.1177/10398562231189431.

[188] J. G. Karp, L. Whitman, and A. Convit. "Intentional Ingestion of Foreign Objects by Male Prison Inmates". In: *Hospital & Community Psychiatry* 42.5 (May 1991), pp. 533–535. ISSN: 0022-1597. DOI: 10.1176/ps.42.5.533.

[189] Tae Hee Lee et al. "Foreign Objects in Korean Prisoners". In: *The Korean Journal of Internal Medicine* 22.4 (Dec. 2007), pp. 275–278. ISSN: 1226-3303, 2005-6648. DOI: 10.3904/kjim.2007.22.4.275. (Visited on 04/14/2025).

[190] Qing Liu et al. "Emergency Removal of Ingested Foreign Bodies in 586 Adults at a Single Hospital in China According to the European Society of Gastrointestinal Endoscopy (ESGE) Recommendations: A 10-Year Retrospective Study". In: *Medical Science Monitor: International Medical Journal of Experimental and Clinical Research* 28 (July 2022), e936463. ISSN: 1643-3750. DOI: 10.12659/MSM.936463.

[191] F. A. Mezouari et al. "Ingestion Of Foreign Bodies In Prisons: How Should They Be Managed: Study Of 13 Cases". In: *Turkish Journal Of Gastroenterology* (2023). DOI: 10.5152/tjg.2023.101123.

[192] S. Mosca et al. "Endoscopic Management of Foreign Bodies in the Upper Gastrointestinal Tract: Report on a Series of 414 Adult Patients". In: *Endoscopy* 33.8 (Aug. 2001), pp. 692–696. ISSN: 0013-726X. DOI: 10.1055/s-2001-16212.

[193] Natalie Lee Yee Ngu, Jadon Karp, and Kirstin Taylor. "Patient Characteristics, Outcomes and Hospital-Level Healthcare Costs of Foreign Body Ingestion from an Australian, Non-Prison Referral Centre". In: *BMJ Open Gastroenterology* 10.1 (Feb. 2023), e001087. ISSN: 2054-4774. DOI: 10.1136/bmjgast-2022-001087. (Visited on 03/30/2025).

[194] S.T. O'Sullivan et al. "Deliberate Ingestion of Foreign Bodies by Institutionalised Psychiatric Hospital Patients and Prison Inmates". In: *Irish Journal of Medical Science* 165.4 (1996), pp. 294–296. ISSN: 00211265 (ISSN). DOI: 10.1007/BF02943095.

[195] R Palta et al. "Foreign-Body Ingestion: Characteristics and Outcomes in a Lower Socioeconomic Population with Predominantly Intentional Ingestion". In: *GASTROINTESTINAL ENDOSCOPY* 69.3 (Mar. 2009), pp. 426–433. ISSN: 0016-5107. DOI: 10.1016/j.gie.2008.05.072.

[196] Alexander R. Robertson. "Self-harm by Sharp Foreign Body Ingestion". In: *Suicide and Life-Threatening Behavior* 49.3 (June 2019), pp. 735–738. ISSN: 0363-0234. DOI: 10.1111/sltb.12474.

[197] J. I. Rodríguez-Hermosa et al. "Surgically Treated Perforations of the Gastrointestinal Tract Caused by Ingested Foreign Bodies". In: *Colorectal Disease: The Official Journal of the Association of Coloproctology of Great*

Britain and Ireland 10.7 (Sept. 2008), pp. 701–707. ISSN: 1463-1318. DOI: 10.1111/j.1463-1318.2007.01401.x.

[198] Babak T. Sagvand et al. "Emergent Endoscopy for Esophageal Foreign Body Removal: The Impact of Location". In: *Cureus* 14.2 (Feb. 2022), e21929. ISSN: 2168-8184. DOI: 10.7759/cureus.21929.

[199] George Tambakis et al. "Management Of Foreign Body Ingestion In Adults: Time To Stop And Rethink Endoscopy". In: *Endoscopy International Open* (2023). DOI: 10.1055/a-2201-6928.

[200] Tanimoto C. et al. "Self-Harm And Suicide Attempts In A Japanese Psychiatric Hospital". In: *East Asian Archives Of Psychiatry* (2018). DOI: 10.12809/eaapl81732.

[201] A. Volpi et al. "Ingestion Of Foreign Bodies Among Prisoners: A Ten Years Retrospective Study At University Hospital Of Southern Italy". In: *Il Giornale Di Chirurgia* (2017). DOI: 10.11138/gchir/2017.38.2.080.

[202] Kai Wang et al. "Multicenter Investigation Of Pediatric Gastrointestinal Tract Magnets Ingestion In China". In: *Bmc Pediatrics* (2020). DOI: 10.1186/s12887-020-1990-9.

[203] Steven T Weiland and Michael J Schurr. "Conservative Management of Ingested Foreign Bodies". In: *Journal of Gastrointestinal Surgery* 6.3 (May 2002), pp. 496–500. ISSN: 1091-255X. DOI: 10.1016/S1091-255X(01)00027-0. (Visited on 04/14/2025).

[204] Sina Yadollahi et al. "Endoscopic Management Of Intentional Foreign Body Ingestion: Experience From A Uk Centre". In: *Frontline Gastroenterology* (2022). DOI: 10.1136/flgastro-2021-101776.

[205] Ye Zong et al. "Differences Between Intentional And Accidental Ingestion Of Foreign Body In China". In: *Bmc Gastroenterology* (2020). DOI: 10.1186/s12876-020-01224-z.

[206] American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders (5th Ed.)* 2013.

[207] Francis Mading Deng, UN Representative of the Secretary-General on Internally Displaced Persons, and UN Office for the Coordination of Humanitarian Affairs. *Guiding Principles on Internal Displacement*. Tech. rep. UN Doc E/CN.4/1998/53/Add.2. United Nations Commission on Human Rights, Feb. 1998. (Visited on 03/31/2025).

APPENDIX A
ELIGIBILITY CRITERIA

A. Inclusion Criteria

Category	Details
Population	Any human. Any age group.
Interventions or exposures	Humans that have: – Intentionally – Ingested a foreign object through the oral cavity (mouth).
Comparators / Control group	Motivation/reason for ingestion: – Protest – Suicidal intent – Self-harm – Psychiatric and other documented motivations Intervention details: – Number of ingestions – Management strategies (Conservative, Endoscopic, Surgical) Object characteristics: – Multiple objects – Blunt objects – Sharp-pointed objects – Long objects ($>$6 cm) – Short objects ($\leq$6 cm) Setting/location
Outcomes of interest	– Endoscopic intervention – Surgical intervention – Conservative management – Complication rates – Mortality rates
Setting	Any setting.
Study designs	– Observational studies (cohort, case-control, cross-sectional) – Case series – Clinical trials – Case reports

B. Exclusion Criteria

#	Exclusion Criterion
1	Full text not available in English.
2	Studies not focusing on intentional self-ingestion (into the gastrointestinal tract) of foreign object via the oral cavity (mouth) or where unclear if ingested.
3	Studies focussing solely on accidental ingestion.
4	Non-human or animal studies.
5	Reviews, editorials, commentaries, and opinion pieces without original empirical data.
6	Duplicate publications or studies with overlapping data sets (the most comprehensive or recent study will be included).
7	Studies focusing on ingestion or co-ingestion of substances (e.g. poisons, medications) rather than physical foreign objects.
8	Ingestions undertaken in controlled environments as part of a voluntary study.
9	Ingestions not explicitly stated to be intentional and history not suggestive of deliberate ingestion (i.e. Age ¡ 8, no history of previous ingestions, no psychiatric co-morbidities, not a prisoner/detainee/vulnerable group).
10	Does not meet inclusion criteria.
11	Ingestions where death resulted from other means (i.e. suicide).
12	Studies before the advent of endoscopy (1906).

APPENDIX B
KEYWORDS AND MESH TERMS

A. PubMed

Concept	Keywords	MeSH Terms
Foreign Bodies	”foreign obj*”	Foreign Bodies [MeSH]
	”foreign bod*”	
Intentional Ingestion / Self-harm	”intent*”	Self-Injurious Behavior [MeSH]
	”deliberate*”	
	”purpose*”	
	”self-injur*”	
	”selfharm*”	
	”self-harm*”	
Ingestion Behavior	”ingest*”	–
	”swallow*”	
Interventions	”surg*”	Endoscopy [MeSH]
	”endoscop*”	Surgical Procedures, Operative [MeSH]
	”EGD”	Conservative Treatment [MeSH]
	”OGD”	Drug Therapy [MeSH]
	”Esophagogastroduodenoscopy”	
	”Oesophagogastroduodenoscopy”	
	”manag*”	

TABLE I: Concepts with associated keywords and MeSH terms used in PubMed search strategy.

B. Embase

Concept	Keywords	EMTREE Terms
Foreign Bodies	”foreign obj*”	”foreign body”/exp
	”foreign bod*”	
Intentional Ingestion / Self-harm	”intent*”	”automutilation”/exp
	”deliberate*”	
	”purpose*”	
	”self-injur*”	
	”selfharm*”	
	”self-harm*”	
Ingestion Behavior	”ingest*”	”swallowing”/exp
	”swallow*”	
Interventions	”surg*”	”endoscopy”/exp
	”endoscop*”	”surgery”/exp
	”EGD”	”conservative treatment’/exp
	”OGD”	’drug therapy”/exp
	”Esophagogastroduodenoscopy”	
	”Oesophagogastroduodenoscopy”	
	”manag*”	

TABLE II: Concepts with associated keywords and EMTREE terms used in Embase search strategy.

C. Cochrane (CENTRAL)

Concept	Keywords	Cochrane MeSH Terms
Foreign Bodies	”foreign obj*” ”foreign bod*” (foreign NEXT obj*) (foreign NEXT bod*)	[mh foreign bodies]
Intentional Ingestion / Self-harm	intent* deliberate* purpose* (self NEXT injur*) (self NEXT harm*)	[mh self-injurious behavior]
Ingestion Behavior	ingest* swallow*	–
Interventions	surg* endoscop* EGD Esophagogastroduodenoscopy Oesophagogastroduodenoscopy manag*	[mh endoscopy] [mh surgical procedures, operative] [mh conservative treatment] [mh drug therapy]

TABLE III: Concepts with associated keywords and Cochrane MeSH terms used in CENTRAL search strategy.

D. Web of Science

Concept	Keywords	Search Field
Foreign Bodies	foreign obj* foreign bod* automutilation	ALL=
Intentional Ingestion / Self-harm	intent* deliberate* purpose* self-injur* selfharm* self-harm*	ALL=
Ingestion Behavior	swallowing ingest* swallow*	ALL=
Interventions	endoscopy surgery conservative treatment drug therapy surg* endoscop* EGD Esophagogastroduodenoscopy Oesophagogastroduodenoscopy manag*	ALL=

TABLE IV: Concepts with associated keywords and Web of Science fields used in the search strategy.

E. Scopus

Concept	Keywords	Search Field / Syntax
Foreign Bodies	foreign PRE/0 obj* foreign PRE/0 bod*	ALL()
Intentional Ingestion / Self-harm	intent* deliberate* purpose* self PRE/0 injur* self PRE/0 harm*	ALL()
Ingestion Behavior	ingest* swallow*	ALL()
Interventions	endoscopy surgery 'conservative' 'treatment' 'drug' 'therapy' surg* endoscop* egd esophagogastroduodenoscopy oesophagogastroduodenoscopy manag*	ALL()

TABLE V: Concepts with associated keywords and Scopus syntax used in the search strategy.

F. PsycINFO

Concept	Keywords	PsycINFO Descriptors
Foreign Bodies	foreign obj* foreign bod* automutilation	–
Intentional Ingestion / Self-harm	intent* deliberate* purpose* self injur* self harm*	DE "Nonsuicidal Self-Injury"
Ingestion Behavior	ingest* swallow* endoscop*	DE "Ingestion"
Interventions	conservative treatment drug therapy surg* egd esophagogastroduodenoscopy oesophagogastroduodenoscopy manag*	DE "Surgery"

TABLE VI: Concepts with associated keywords and controlled vocabulary (Descriptors) used in PsycINFO search strategy.

G. Google Scholar

Concept	Keywords	Search Field
Foreign Bodies	”foreign obj*” ”foreign bod*”	–
Intentional Ingestion / Self-harm	”intent*” ”deliberate*” ”purpose*” ”self-injur*” ”selfharm*” ”self-harm*”	–
Ingestion Behavior	”ingest*” ”swallow*”	–

TABLE VII: Concepts with associated keywords used in Google Scholar search strategy.

APPENDIX C
VARIABLE DEFINITIONS

Used for case report data extraction. Aggregates of which where used to create Variable_Rate and Variable_Count.

Variable	Definition
Is_Prisoner	Documented in prison, police custody, or detained (including immigration detention) at the time of the encounter; 'N' if not detained; 'UK' if unknown.
Psych_Hx	Documented DSM-V mental disorder (including substance-related disorders) [206]; 'N' if no diagnosis; 'UK' if data unavailable.
Is_Displaced_Person	Meets International Organisation for Migration definition of a displaced person [207]; 'N' if not displaced; 'UK' if unknown.
Under_Influence_Alcohol	Evidence, suspicion, or self-report of alcohol influence at presentation; 'N' if no indication; 'UK' if unknown.
Is_Psych_Inpat	Admitted (voluntarily or involuntarily) to a psychiatric facility/ward at encounter; 'N' if not admitted; 'UK' if unknown.
Severe_Disability_Hx	History of severe learning disability or impaired consciousness; 'N' if absent; 'UK' if unknown.
Previous_Ingestions	Prior episode of foreign-body ingestion documented; 'N' if first ingestion; 'UK' if history unknown.
Motivation_Intent_To_Harm	Ingestion intended for self-harm, self-injury, or suicide; 'N' if other motive; 'UK' if unclear.
Motivation_Protest	Ingestion as protest, demonstration, or manipulation (e.g., objection to detention conditions); 'N' if not protest-related; 'UK' if unclear.
Motivation_Psychiatric	Ingestion driven primarily by an underlying psychiatric condition (psychosis, impulsivity, etc.); 'N' if not psychiatric; 'UK' if unclear.
Motivation_Psychosocial	Ingestion motivated by social or interpersonal factors (imitative acts, shock value, body-image, safekeeping, etc.); 'N' if not psychosocial; 'UK' if unclear.
Motivation_Unknown	No clear motivation identified in documentation; 'N' if specific motive recorded; 'UK' if ambiguous.
Object_Button_Battery	Button battery ingested; 'N' if not; 'UK' if object type not recorded.
Object_Magnet	Magnet ingested; 'N' if none; 'UK' if unknown.
Object_Long	Ingested object length $>$ 5 cm; 'N' if $\leq$ 5 cm; 'UK' if dimensions unknown.
Object_Long_Sharp	'Y' when both Object_Long and Object_Sharp are 'Y'; 'N' otherwise; 'UK' if either unknown.
Object_Short	Derived: object length $<$ 5 cm when Object_Long='N'; retains 'UK' if dimensions unknown.
Object_Short_Sharp	'Y' when both Object_Short and Object_Sharp are 'Y'; 'N' otherwise; 'UK' if either unknown.
Object_Sharp	Object described as sharp or pointed (e.g., blades, nails, needles); 'N' if not sharp; 'UK' if unclear.
Object_Multiple	More than one object ingested in same episode; 'N' for single object; 'UK' if number unspecified.
Object_Unknown	Where object characteristics are unknown. 'N' if known; 'UK' if Unknown.
Outcome_Endoscopy	Endoscopic intervention performed during episode; 'N' if not; 'UK' if unavailable.
Outcome_Surgery	Surgical intervention performed (operative procedure under anaesthesia); 'N' if not; 'UK' if not documented.
Outcome_Endoscopy_Surgery	'Y' if both Outcome_Endoscopy and Outcome_Surgery are 'Y'; 'N' otherwise; 'UK' if data insufficient.
Outcome_Conservative	'Y' if managed without endoscopy or surgery; 'N' if either procedure performed.
Outcome_Death	Death causally related to ingestion complications; 'N' if survived; 'UK' if outcome unknown.
Outcome_Perforation	Clinical or radiological evidence of gastrointestinal or airway perforation; 'N' if absent; 'UK' if unknown.
Outcome_Obstruction	Confirmed or suspected gastrointestinal obstruction; 'N' if none; 'UK' if not documented.
Outcome_Injury_Needing_Intervention	Injury necessitating medical/procedural intervention and influencing decision for endoscopy/surgery; 'N' if no such injury; 'UK' if data unavailable.
Outcome_Other	Other clinically significant outcomes (aspiration, sepsis, prolonged stay, etc.); 'N' if none; 'UK' if data insufficient.
Outcome_Unknown	Where no outcome identified; 'N' if outcome identified; 'UK' if Unknown.