

# Foreign Body in the Oesophagus: A Retrospective Study from National City Hospital, Bharatpur, Chitwan, Nepal

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## ABSTRACT

**Background:** Foreign body (FB) ingestion is a common clinical emergency requiring prompt diagnosis and management. This retrospective study analyzes demographic distribution, types of ingested foreign bodies, and sites of impaction among 85 patients who presented at National City Hospital, Bharatpur, Chitwan, Nepal, during the period of one year from January 2024 to December 2024.

**Methods:** This retrospective study was conducted at National City Hospital, Bharatpur, Nepal, from January to December 2024, including 85 patients with confirmed esophageal foreign body impaction. Patients undergoing endoscopic, surgical, or conservative retrieval were included, while those with unconfirmed ingestion or unrelated esophageal diseases were excluded. Data on demographics, foreign body type, site of impaction, and treatment outcomes were collected from medical records. Radiological and endoscopic findings were reviewed to confirm diagnoses. This study analyzed local patterns of foreign body impaction and management strategies. Ethical approval was obtained before data collection.

**Results:** The majority of cases occurred in adults, with a male predominance of 52%. The mean age of patients was 49 years, ranging from 5 to 94 years. Meat bones were the most common foreign body, accounting for 61.2% of cases, followed by fish hooks at 21.2%. Most foreign bodies were lodged in the upper oesophagus (71.8%). Endoscopic retrieval was the primary management approach, with a success rate of 89.4%. A notable seasonal variation in foreign body ingestion was observed, particularly during Nepalese festivals when meat consumption increases.

**Conclusion:** Foreign body ingestion remains a prevalent issue in Nepal, particularly among middle-aged adults. Meat bones are the most common foreign body, with the upper oesophagus being the primary site of impaction. Endoscopic retrieval remains the mainstay of treatment. Given the seasonal increase in cases, public awareness campaigns on safe eating practices during festivals are warranted.

**Keywords:** foreign body; oesophagus; Nepal; endoscopy; meat bone; seasonal variation.

## INTRODUCTION

Esophageal foreign body impaction is a common medical emergency requiring endoscopic intervention and carries risks of serious complications such as perforation, hemorrhage, and even death.<sup>1-4</sup> In children, especially between six months and six years, accidental ingestion is frequent.<sup>3</sup> Among adults, impactions are often linked to meat bolus ingestion or underlying esophageal disorders like strictures or malignancy.<sup>4,6,8</sup> The global incidence is approximately 13 cases per 100,000 people annually, with up to 1,500 deaths reported in some regions.<sup>5-7</sup> Common anatomical sites for impaction include the cricopharyngeus, aortic arch level, and lower

esophageal sphincter.<sup>6</sup> Symptoms vary from mild discomfort to severe respiratory distress.<sup>7</sup> While 80-90% of foreign bodies pass spontaneously, 10-20% require endoscopy, and under 1% need surgery.<sup>8,9-11</sup> In Nepal, such cases rise during festivals due to increased meat consumption. However, despite its frequency, there is a lack of comprehensive epidemiological data on esophageal foreign body impaction in the local context. This study aims to evaluate the epidemiology, types of foreign bodies encountered, and anatomical sites of impaction in Nepalese patients presenting to National City Hospital, thereby contributing valuable local data for comparison with international trends and informing regional public health strategies.

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## METHODS

This was a retrospective observational study carried out at the Department of Gastromedicine of National City Hospital, Bharatpur, Chitwan, Nepal among those patients who presented with oesophageal foreign body impaction during January 2024 to December 2024. A total of 85 patient cases were included, all of whom had a recorded history of foreign body impaction in the oesophagus and underwent medical evaluation and treatment at the hospital during the defined timeframe. To ensure the reliability and relevance of the data, clear inclusion and exclusion criteria were established. Patients with a confirmed history of foreign body impaction in the oesophagus, and who had undergone an endoscopic or alternative medical/surgical intervention for foreign body retrieval were included in this study. Conversely, patients who presented with a suspected but unconfirmed history of foreign body ingestion, and patients who were diagnosed with oesophageal pathology or complications unrelated to foreign body presence, such as malignancy, strictures, or motility disorders were excluded from this study. Ethical approval was taken from National City Hospital before data collection. Data was collected from the hospital records, including both physical patient files and electronic medical records (EMRs) maintained by the hospital's information system. A standardized data abstraction form was developed to ensure consistency in data collection. The variables extracted included demographic details (age, sex, and place of residence), clinical data (nature and type of foreign body ingested, duration since ingestion), anatomical data (specific site of impaction within the oesophagus), and procedural information (type of intervention performed for foreign body removal endoscopic, conservative observation, or surgical method). Where applicable, radiological reports (X-ray, CT scan) and endoscopy records were reviewed to corroborate the site and type of foreign body. The timing of intervention, success or failure of retrieval, and any post-procedural complications or follow-up notes were also recorded.

Data relevant to the study objectives were compiled

into a structured spreadsheet database, allowing for subsequent analysis. Being retrospective in nature, this study design allowed the researchers to analyze existing clinical data without influencing patient management or outcomes. This methodological framework facilitated the identification of trends and patterns related to oesophageal foreign body impaction in the local population. It also provided insight into the clinical decision-making processes adopted by healthcare providers, including the choice of intervention strategies and the outcomes achieved. Special attention was given to understanding the types of foreign bodies most commonly encountered in the region, common sites of impaction within the oesophagus, demographic trends, and any correlations between patient characteristics and the type of intervention required.

## RESULTS

A total of 84 patients with esophageal foreign body (FB) impaction were included in the study. The age distribution showed that the highest proportion of patients (25.0%) were between 40–50 years, followed by 21.4% in the 30–40 years group. The mean age was 49.60 years with a standard deviation of  $\pm 16.31$ , ranging from 5 to 94 years. In terms of sex, the study included slightly more males (51.2%) than females (48.8%). Regarding ethnicity, the majority of the patients were Janajati (38.1%), followed by Brahman (19.0%), Chhetri and Chaudhary (both 15.5%), Dalit (8.3%), Rana (2.4%), and Muslim (1.2%). Most patients were residents of Chitwan district (61.9%), with others coming from nearby districts such as Nawalparasi (10.7%), Makwanpur (9.5%), Lamjung (6.0%), Gorkha and Tanahun (each 3.6%), Kathmandu (2.4%), and Manang and Baglung (each 1.2%) (Table 1).

In terms of the type of foreign body, the most commonly ingested item was bone (63.1%), followed by fish hooks (20.2%), meat balls (11.9%), false dentures (3.6%), and others (1.2%). Regarding the method of removal, the majority (84.5%) of foreign bodies were retrieved using a rigid tube forceps (RTF), while 15.5% were pushed down into the

| <b>Table 1. Sociodemographic characteristics of patients. (n=84)</b> |                      |
|--|----------------------|
| <b>Variables</b>   | <b>Frequency (%)</b> |
| <b>Age (years)</b>   |                      |
| <20  | 4(4.8)               |
| 20-30  | 4(4.8)               |
| 30-40  | 18(21.4)             |
| 40-50  | 21(25.0)             |
| 50-60  | 17(20.2)             |
| 60-70  | 10(11.9)             |
| >70  | 10(11.9)             |
| Mean $\pm$ SD  | 49.60 $\pm$ 16.31    |
| <b>Minimum (Maximum) = 5(94)</b>                                     |                      |
| <b>Sex</b>   |                      |
| Female   | 41(48.8)             |
| Male   | 43(51.2)             |
| <b>Ethnicity</b>   |                      |
| Bramhan  | 16(19.0)             |
| Chaudhary  | 13(15.5)             |
| Chhetri  | 13(15.5)             |
| Dalit  | 7(8.3)               |
| Janajati   | 32(38.1)             |
| Muslim   | 1(1.2)               |
| Rana   | 2(2.4)               |
| <b>Address</b>   |                      |
| Baglung  | 1(1.2)               |
| Chitwan  | 52(61.9)             |
| Gorkha   | 3(3.6)               |
| Kathmandu  | 2(2.4)               |
| Lamjung  | 5(6.0)               |
| Makwanpur  | 8(9.5)               |
| Manang   | 1(1.2)               |
| Nawalparasi  | 9(10.7)              |
| Tanahu   | 3(3.6)               |

stomach. The site of impaction was most frequently the upper esophagus (72.6%), followed by the mid esophagus (15.5%), oropharynx (10.7%), and the lower esophagus (1.2%) (Table 2).

The analysis of foreign body (FB) types across different demographic variables showed that bone FBs were predominant overall, especially among younger patients. For instance, 100% of patients under 20 years had bone FBs, while bone impaction decreased slightly in older age groups, with 60% in those above 70 years. Other FB types like fish hooks and meat balls were more common in middle and

| <b>Table 2. Information about type, site of foreign body and method of extraction of foreign body. (n=84)</b> |                      |
|---|----------------------|
| <b>Variables</b>  | <b>Frequency (%)</b> |
| <b>Type of FB</b>   |                      |
| Bone  | 53(63.1)             |
| False denture   | 3(3.6)               |
| Fish Hook   | 17(20.2)             |
| Meat ball   | 10(11.9)             |
| Others  | 1(1.2)               |
| <b>Site</b>   |                      |
| Lower esophagus   | 1(1.2)               |
| Mid esophagus   | 13(15.5)             |
| Oropharynx  | 9(10.7)              |
| Upper esophagus   | 61(72.6)             |
| <b>Method</b>   |                      |
| Pushed to stomach   | 13(15.5)             |
| Retrieved with RTF  | 71(84.5)             |

older age groups - for example, 33.3% of 30–40-year-olds had fish hook FBs, and 30% of patients aged 60–70 had meat ball FBs. False dentures appeared mainly in older patients, such as 20% in the 60–70 age group. By sex, 65.9% of females and 60.5% of males experienced bone FB impaction. Males had a higher proportion of fish hook cases (23.3%) compared to females (17.1%), while false dentures were rare in both groups. Ethnicity-wise, the Janajati group had the highest proportion of bone FBs (75%), whereas the Dalit and Chaudhary groups showed more varied FB types with 42.9% Dalits having fish hook FBs and 38.5% Chaudharis also affected by fish hooks. False dentures were most frequent among Brahman (12.5%) and Chhetri (7.7%) groups. Geographically, Chitwan had the highest number of cases with bone FBs at 61.5%, followed by fish hooks (19.2%) and meat balls (11.5%). Some districts like Gorkha, Lamjung, and Manang reported exclusively bone FBs (100%), whereas Nawalparasi had a significant number of fish hook FBs (44.4%) (Table 3).

The majority of bone foreign bodies were located in the upper esophagus, accounting for 83.6% of cases at this site. In contrast, false dentures were relatively rare but mostly found in the upper esophagus (4.9%). Fish hooks were predominantly lodged in the oropharynx, with 100% of cases occurring

**Table 3. Distribution of FB according to different covariates. (n=84)**

| Variables          | Type of FB |               |           |           |        |
|--------------------|------------|---------------|-----------|-----------|--------|
|                    | Bone       | False denture | Fish Hook | Meat ball | Others |
| <b>Age (years)</b> |            |               |           |           |        |
| <20                | 4(100)     | -             | -         | -         | -      |
| 20-30              | 3(75)      | -             | 1(25)     | -         | -      |
| 30-40              | 12(66.7)   | -             | 6(33.3)   | -         | -      |
| 40-50              | 15(71.4)   | -             | 5(23.8)   | 1(4.8)    | -      |
| 50-60              | 9(52.9)    | 1(5.9)        | 3(17.6)   | 4(23.5)   | -      |
| 60-70              | 4(40)      | 2(20)         | -         | 3(30)     | 1(10)  |
| >70                | 6(60)      | -             | 2(20)     | 2(20)     | -      |
| <b>Sex</b>         |            |               |           |           |        |
| Female             | 27(65.9)   | 2(4.9)        | 7(17.1)   | 5(12.2)   | -      |
| Male               | 26(60.5)   | 1(2.3)        | 10(23.3)  | 5(11.6)   | 1(2.3) |
| <b>Ethnicity</b>   |            |               |           |           |        |
| Bramhan            | 10(62.5)   | 2(12.5)       | 3(18.8)   | 1(6.3)    | -      |
| Chaudhary          | 7(53.8)    | -             | 5(38.5)   | 1(7.7)    | -      |
| Chhetri            | 8(61.5)    | 1(7.7)        | 1(7.7)    | 3(23.1)   | -      |
| Dalit              | 3(42.9)    | -             | 3(42.9)   | 1(14.3)   | -      |
| Janajati           | 24(75)     | -             | 4(12.5)   | 4(12.5)   | -      |
| Muslim             | 1(100)     | -             | -         | -         | -      |
| Rana               | -          | -             | 1(50)     | 1(50)     | -      |
| <b>Address</b>     |            |               |           |           |        |
| Baglung            | -          | -             | -         | 1(100)    | -      |
| Chitwan            | 32(61.5)   | 3(5.8)        | 10(19.2)  | 6(11.5)   | 1(1.9) |
| Gorkha             | 3(100)     | -             | -         | -         | -      |
| Kathmandu          | -          | -             | 2(100)    | -         | -      |
| Lamjung            | 5(100)     | -             | -         | -         | -      |
| Makwanpur          | 5(62.5)    | -             | -         | 3(37.5)   | -      |
| Manang             | 1(100)     | -             | -         | -         | -      |
| Nawalparasi        | 5(55.6)    | -             | 4(44.4)   | -         | -      |
| Tanahun            | 2(66.7)    | -             | 1(33.3)   | -         | -      |

there, followed by the mid esophagus, where they accounted for 76.9% of foreign bodies. In the mid esophagus, bone FBs were rare (7.7%), and meat balls were also frequently observed (15.5%). The lower esophagus had only a single case of bone foreign body (100%) (Table 4).

**Table 4. Distribution of FB on the site of body.**

| Site            | Type of FB |               |           |           |        |
|-----------------|------------|---------------|-----------|-----------|--------|
|                 | Bone       | False denture | Fish Hook | Meat ball | Others |
| Lower esophagus | 1(100)     | -             | -         | -         | -      |
| Mid esophagus   | 1(7.7)     | -             | 2(15.5)   | 10(76.9)  | -      |
| Oropharynx      | -          | -             | 9(100)    | -         | -      |
| Upper esophagus | 51(83.6)   | 3(4.9)        | 6(9.8)    | -         | 1(1.6) |

## DISCUSSION

This retrospective study from National City Hospital provides valuable insights into the epidemiology and management of oesophageal foreign body impaction within the Nepalese context. The key findings include a slight male predominance, a mean patient age of 49 years with a significant proportion of middle-aged adults, the overwhelming prevalence of meat bones as the ingested foreign body, the upper oesophagus as the most common site of impaction, a high success rate with endoscopic retrieval, and a distinct seasonal variation linked to Nepalese festivals. These findings offer a basis for comparison with international literature, highlighting both universal patterns and unique regional characteristics.

The current study conducted in Bharatpur, Nepal, involved 85 patients with an age range of 5 to 94 years and a mean age of 49 years. The gender distribution was nearly balanced, with males representing 52% and females 48% of the sample. Comparatively, Wang et al.<sup>11</sup> in China included a larger sample of 1,311 patients with a mean age of 54.2 years, where females comprised a higher proportion (61.17%) than males (38.83%). Hristove et al.<sup>7</sup>'s Bulgarian study had 281 patients, with a male majority of 64.77%, though the mean age was not specified. Chen et al.<sup>11</sup>'s multi-country study with 1,305 patients reported a wider mean age range (47.6 to 62.8 years) and varied gender proportions, with males ranging from 46.2% to 70.5% and females from 29.5% to 53.81%. Lastly, Al-Haddad et al.<sup>13</sup> in the USA studied 174 patients with an average age of 61.4 years, predominantly males (58.6%) compared to females (41.4%). This variation in gender distribution may reflect specific cultural, occupational, or social factors prevalent in different regions, influencing exposure or eating behaviours. The detailed observation that patients from Kathmandu frequently ingested fish bones after eating in Malekhu, a location renowned for its fish dishes, underscores the significant role of specific dietary practices and travel patterns in foreign body ingestion. Such granular information about patient origin and specific eating habits offers valuable context that might not be captured in broader



epidemiological studies.

The current study identified meat bone as the most frequent foreign body (61.2%) among patients, followed by fish hooks (21.2%) and meat balls (10%). This finding aligns with dietary habits and local food preferences in Nepal, where meat consumption is common. A unique observation was the presence of mango pericarp as a foreign body, which may reflect regional dietary practices. Comparatively, studies from other countries report some variation in the types of foreign bodies encountered. Loh et al. in Germany found fish bones (45%) and other bones (40%) to be the most prevalent, with dentures accounting for 15% of cases, reflecting different demographic and dietary profiles. Wang et al.,<sup>11</sup> in China reported jujube pits (36.72%) as the most common foreign body, followed by fish bones (22%), highlighting the influence of local food items on foreign body ingestion. Similarly, studies from the USA by Al Haddad et al.,<sup>13</sup> noted food boluses, fish bones, and meat or seafood as the predominant foreign bodies, emphasizing a pattern where food-related objects are frequent causes of impaction. Neacsu et al.,<sup>14</sup>'s Romanian study further supports this trend with food boluses and fish or chicken bones being common. These comparisons indicate that the type of foreign body often correlates strongly with regional dietary habits, cultural practices, and population demographics. Understanding these differences is crucial for healthcare providers to anticipate the types of foreign bodies likely to be encountered and to tailor preventive and treatment strategies accordingly. In the current study conducted in Nepal, the majority of foreign bodies (71.8%) were located in the upper esophagus, with 28.2% found in the mid esophagus. No cases were reported in the lower esophagus or other sites. This finding is consistent with several other studies indicating that the upper esophagus is the most common site for foreign body impaction. For example, Longstreth et al.,<sup>4</sup> reported 67% of cases in the upper esophagus across multiple countries, and Khan et al. in Pakistan found a similar prevalence of 68.5%. Ratcliff's study in the USA also supported this trend with 70% of foreign bodies lodged in the upper

esophagus. However, some regional variations exist. Bonasso et al.,<sup>12</sup> from Italy reported a lower percentage (27%) of foreign bodies in the upper esophagus, with a higher proportion in the mid esophagus (44%). Similarly, Al-Haddad et al.,<sup>13</sup> from the USA found only 20.1% of foreign bodies in the upper esophagus, but a significant number (54%) in the lower esophagus, indicating variability possibly related to differences in patient population, type of foreign bodies, and diagnostic approaches. Wang et al. from China reported some foreign bodies reaching beyond the esophagus, including the stomach (11.76%) and duodenum (2.28%), which contrasts with our study where no such cases were observed. This may reflect differences in healthcare access, referral patterns, or the nature of the ingested objects. The consistency of the upper oesophagus as the primary impaction site across diverse studies and regions, including Nepal, suggests a universal anatomical predisposition. This highlights a fundamental physiological principle rather than a regional variation, as the cricopharyngeus muscle and the narrowest part of the oesophagus act as a consistent bottleneck, regardless of the type of foreign body. Consequently, clinical assessment and initial imaging should always prioritize this region when an oesophageal foreign body is suspected, irrespective of patient demographics or the suspected ingested object. The present study conducted in Nepal demonstrated a high success rate of foreign body retrieval, with an 89.4% retrieval rate. This finding aligns with global studies showing high success rates for endoscopic or non-surgical removal of esophageal foreign bodies. For instance, Chen et al.,<sup>10</sup> reported success rates ranging from 94.76% to 98.7% in a multi-country study, while Al-Haddad et al. in the USA and Neacsu et al.,<sup>14</sup> in Romania documented retrieval rates of 94.8% and 95%, respectively. The slightly lower success rate in the current study compared to some international reports may reflect differences in patient characteristics, types of foreign bodies, or available medical resources.

Regarding complications, Longstreth et al.,<sup>4</sup> noted a 17.8% complication rate with a 3.4% surgical intervention rate, highlighting the risk of adverse

outcomes during retrieval. Wang et al.,<sup>6</sup> reported a 14.29% rate of surgical intervention in China. Although the current study did not explicitly report complication rates or surgical interventions, the relatively high retrieval rate suggests effective management, possibly minimizing the need for surgery. These comparisons underscore the importance of timely and skilled intervention to maximize retrieval success and minimize complications in patients with esophageal foreign bodies. The high rate of endoscopic intervention in this study, coupled with its notable success rate, aligns with the established need for intervention in a significant minority of cases that do not resolve spontaneously.<sup>15</sup> The consistent high success rate of endoscopic retrieval across diverse studies and regions, including Nepal, indicates that this intervention is a universally effective and safe primary management strategy for oesophageal foreign bodies. This reinforces the critical importance of timely access to endoscopic services and highlights that investment in such facilities and training is crucial in all healthcare settings, as it represents the most effective frontline treatment. The management modalities employed in this study, such as the use of rat tooth forceps for retrieval and the gentle pushing of some foreign bodies into the stomach, are consistent with standard endoscopic techniques. Pushing of food boluses, often facilitated by a Savary guide, is a recognized and safe method, particularly for non-sharp objects that are amenable to such manipulation. A significant and particularly relevant observation in this study is the distinct seasonal variation in foreign body ingestion, characterized by an increase during Nepalese festivals when meat consumption substantially rises. This finding establishes a direct correlation between specific cultural dietary practices and the incidence of foreign body impaction. This pattern moves beyond a simple observation of seasonal trends to a direct causal link rooted in cultural celebrations, offering a more specific and actionable understanding than general "holiday" increases observed in other contexts. For instance, while not always tied to specific festivals, other studies have also noted temporal variations; one

study found a significantly higher occurrence of oesophageal foreign body ingestion on holidays and weekends compared to weekdays, attributing it to "dietary indiscretions" such as consuming large meals. An older review also noted more cases in summer months. The strong association identified in this Nepalese study provides a clear target for public health interventions. It suggests that public awareness campaigns should be specifically timed and tailored to local festive calendars, emphasizing safe eating practices such as thorough chewing and avoiding distractions during periods of high-risk food consumption. This demonstrates how localized epidemiological data can directly inform highly specific and effective public health strategies.

The findings of this study underscore the critical importance of prompt diagnosis and effective management of oesophageal foreign bodies in Nepal, particularly during culturally significant festive seasons. The observed epidemiological patterns highlight the need for targeted public health initiatives. Specifically, public awareness campaigns focusing on safe eating practices, especially concerning meat bones and during periods of increased meat consumption, are strongly warranted. Future research should consider prospective, multi-center studies to validate these findings across a wider demographic, systematically investigate the prevalence of underlying esophageal pathologies in affected individuals, and comprehensively assess long-term outcomes and the efficacy of preventative measures.

## CONCLUSIONS

Foreign body ingestion remains a prevalent clinical emergency in Nepal, predominantly affecting middle-aged adults. The study confirms that meat bones are the most common foreign body, with the upper oesophagus being the primary site of impaction, a pattern consistent with universal anatomical predispositions. Endoscopic retrieval is the mainstay of treatment and demonstrates high success rates, aligning with established international standards for effectiveness and safety. A significant finding unique

to the local context is the pronounced seasonal increase in cases during Nepalese festivals, directly linked to cultural dietary practices involving heightened meat consumption. This epidemiological pattern necessitates targeted public health interventions. Therefore, public awareness campaigns focused on promoting safe eating practices during festive periods are strongly recommended to mitigate this preventable health issue and improve patient outcomes in Nepal.

**Limitation:** This study, being a retrospective and single-center investigation, inherently carries certain limitations. The findings may be subject to selection and referral bias, which could limit their generalizability to the broader Nepalese population.

Furthermore, the study period of one year, while providing initial trends, may not fully capture long-term variations in incidence or less common presentations of foreign body impaction. A notable limitation is the absence of explicit investigation into underlying oesophageal pathologies in the patient cohort, which are known significant risk factors for foreign body impaction, particularly for food boluses. This omission restricts the ability to fully elucidate the pathophysiology in all cases observed.

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