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Profile and Management of Foreign Body Ingestion Patients Before and During the Covid-19 Pandemic at the Corazon Locsin Montelibano Memorial Regional Hospital

ABSTRACT

Objective: To compare the demographic profiles, management and outcomes of patients with foreign body ingestion before and during the COVID-19 pandemic.

Methods:

Design: Retrospective Review of Records

Setting: Tertiary Government Training Hospital

Participants: Records of 156 patients diagnosed with upper digestive tract foreign bodies

Results: One hundred fifty-six (156) patients, 81 from the pre-pandemic period (2018-2020) and 75 during the pandemic period (2020-2022) were included in this study. Median age pre-pandemic was 9 years old (IQR = 34) and 16 years old (IQR = 29) during the pandemic. The male-to-female ratio for pre-pandemic and during the pandemic was 54:27 and 52:23, respectively. The majority of the patients ingested coins (53% pre-pandemic and 44% during the pandemic) followed by dentures (22% pre-pandemic and 35% during the pandemic). Time from ingestion to consult showed a borderline statistically significant difference between the pre-pandemic and during-pandemic periods (t-value = -1.967; p-value of .051). Time from consultation to the operating room had a significant difference between the pre-pandemic and during pandemic (t-value = -2.037; p-value= .043).

Conclusion: The impact of COVID-19 pandemic on foreign body ingestion cases may be reflected in the increased overall time (ingestion to consultation, consultation to operation, operation to discharge and consultation to discharge) during the pandemic compared to the pre-pandemic period. This may be due to several factors, notably implemented lockdown and quarantine protocols and initial delays in release of COVID-19 swab results due to limited resources. Despite the consultation delays and limited hospital resources brought about by the pandemic, no significant morbidity was noted and all patients were discharged well, reflecting healthcare efficiency.

Keywords: foreign body; ingestion; impaction; upper aerodigestive tract; esophagoscopy; COVID-19



Disease caused by the novel coronavirus strain called COVID-19, which started from mainland China, rapidly spread worldwide and caused a pandemic. The virus reached Negros Occidental causing implementation of general community quarantine in our region.^{1,2} Government policies and hospital protocols were implemented to control the spread of the disease, affecting consults and management of common ENT emergency cases, such as foreign body ingestion.³ Foreign body ingestion cases comprise the bulk of consults and admission for otolaryngologists. Objects usually ingested include coins, buttons, pins, fishbones, batteries and magnets.^{4,5}

To the best of our knowledge, based on a search of HERDIN Plus, the Western Pacific Region Index Medicus (WPRIM), the Directory of Open Access Journals (DOAJ), and MEDLINE (PubMed and PubMed Central) using the search terms “foreign body ingestion,” “COVID-19 pandemic,” and “rigid esophagoscopy,” no local study has been published comparing the demographics and outcome of foreign body ingestion patients before and during the COVID-19 pandemic.

This study aims to compare the demographic profiles, management, and outcomes of patients with foreign body ingestion before and during the COVID-19 pandemic at the Corazon Montelibano Memorial Regional Hospital in Bacolod City, Negros Occidental, Philippines.

METHODS

With approval from the Corazon Locsin Montelibano Memorial Regional Hospital Research Ethics Review Committee (CLMMRH RERC) (Protocol number CLMMRH RERC 2024-08), this retrospective series reviewed the medical records of patients admitted at the service or pay wards and/or who sought consult at the Outpatient Department (OPD) or Emergency Room (ER) of CLMMRH due to foreign body ingestion from March 1, 2018 to March 31, 2022.

Foreign body ingestion patients were considered for inclusion in this study if they met the criteria of undergoing rigid esophagoscopy with or without foreign body extraction. All other patients diagnosed with foreign body ingestion but who opted to transfer to private institutions or were discharged against medical advice and those who consulted at the OPD/ER with foreign bodies in the oropharynx/hypopharynx only were excluded.

The demographic profiles retrieved included the age, sex, address and comorbidities of the patient, date of admission, type of foreign body ingested, number of days from ingestion to consult, number of days from consultation to operation, number of days from operation to discharge, subjective and objective complaints as written in the progress notes, diet after the procedure and any complications noted.

Completely anonymized data gathered from chart review using the data collection form were encoded using Research Electronic Data

Capture (REDCap™) application version 14. 0.16 (Vanderbilt University, Nashville, TN, USA) and processed using Python Version 3.8.0 (Python Software Foundation, Wilmington, DE, USA).

Medians and interquartile ranges were used to summarize demographics and frequencies and percentages were used to summarize the management, and clinical outcome data. Pearson correlation and Chi-square test were used to determine the differences between groups and the independent T-test was used to determine the differences in foreign body ingestion to consultation, consultation to operation, operation to discharge and consultation to discharge rates before and during the COVID-19 pandemic.

RESULTS

A total of 156 records of patients with foreign body ingestion were included, with 81 coming from the pre-pandemic period (2018-2020) and 75 during the pandemic period (2020-2022). Most of the participants were from the City of Bacolod for both pre-pandemic (18/81 patients; 22%) and during the pandemic (19/75 patients; 25%). The patient distribution by address is summarized in *Table 1*.

The population pyramids showing disaggregated data on sex and age are shown in *Figures 1 and 2*. Majority of the patients were within the 0-18 years old age range with 45/81 patients (55%) pre-pandemic and 32/75 patients (43%) during the pandemic. Median age pre-pandemic was 9 years old, and 16 years old during the pandemic (interquartile range of 34 and 29 years, respectively). The male-to-female ratio pre-pandemic and during the pandemic was 54:27 and 52:23, respectively.

Analysis of patient clinical data showed that the median time (in hours) between ingestion and consultation was 4 hours (IQR = 6 hours) pre-pandemic and 7 hours (IQR = 10 hours) during the pandemic with the longest time prior to consultation of 120 and 190 hours for pre- and during the pandemic. Meanwhile, the median time from consultation to operation was 15 hours for both pre-pandemic (IQR = 7 hours) and during the pandemic (IQR = 17 hours). It is worth noting, on the other hand, that most of the patients (67/81; 82.72%) pre-pandemic were brought to the OR within 20 hours while only 43/75 patients (57.33%) of patients during the pandemic were transferred within 20 hours. On the other hand, operative time showed that 58/81 patients (71.60%) pre-pandemic and 51/75 patients (68%) during the pandemic were operated on within 25 minutes.

The majority of the patients ingested coins, with 43/81 cases (53.09%) pre-pandemic and 33/75 cases (44%) during pandemic; followed by dentures, 18/81 cases (22.22%) pre-pandemic and 26/75 cases (34.67%) during the pandemic. The other foreign bodies are summarized in *Table 2*. The average age of patients who ingested coins pre- and during the pandemic was 4.9 years old while the average age

of patients who ingested dentures pre- and during the pandemic was 30 years old. The median level of foreign body in the esophagus was 13 cm (IQR = 7 cm) for pre-pandemic and 15 cm (IQR = 7 cm) during the pandemic, with the furthest level of an ingested body being 34 cm (dentures) pre-pandemic and 27 cm (coin) during the pandemic. Most of the patients also did not have comorbidities during the operation (75/81 cases; 92.59%) pre-pandemic and 67/75 cases (89.33%) during the pandemic. The most significant morbidity was hypertension, present in 3 cases pre-pandemic, and 4 cases during the pandemic.

Table 1. Patient Distribution by Address*

Address	Pre-Pandemic		During the Pandemic	
	n	Percentage (%)	n	Percentage (%)
Bacolod	18	22.22	19	25.33
Surrounding areas	20	24.69	12	16.00
Talisay	8	9.88	4	5.33
Bago	7	8.64	3	4.00
Murcia	5	6.17	5	6.67
Don Salvador Benedicto	1	1.23	1	1.33
Northern Municipalities	21	25.93	24	32.00
Escalante	6	7.41	5	6.67
Victorias	3	3.70	0	-
Cadiz	3	3.70	2	2.67
Sagay	3	3.70	2	2.67
San Carlos	3	3.70	5	6.67
EB Magalona	1	1.23	4	5.33
Toboso	1	1.23	0	-
Calatrava	1	1.23	2	2.67
Silay	0	-	4	5.33
Southern Municipalities	19	23.46	19	25.33
Kabankalan	5	6.17	4	5.33
Cauayan	2	2.47	1	1.33
La Castellana	2	2.47	2	2.67
Hinoba-an	2	2.47	3	4.00
Himamaylan	2	2.47	0	-
Moises Padilla	1	1.23	1	1.33
Sipalay	1	1.23	0	-
Valladolid	1	1.23	1	1.33
La Carlota	1	1.23	0	-
Isabela	1	1.23	1	1.33
Binalbagan	1	1.23	0	-
Hinigaran	0	-	3	4.00
Pontevedra	0	-	2	2.67
Candoni	0	-	1	1.33
Negros Oriental	2	2.47	0	-
Canla-on	1	1.23	0	-
Vallehermoso	1	1.23	0	-
Total	81	100	75	100

*Comparison of the geographic distribution of cases before and during the pandemic divided by city/municipality. In both periods, majority of patients were from Bacolod City.

Majority of cases had significant endoscopic findings in 48/81 cases (59.26%) for pre-pandemic, and 52/75 cases (69.33%) during the pandemic. Most common were erythema (22/81 cases; 27.16%) for pre-pandemic; (27/75 cases; 36%) during the pandemic, and edema (24/81 cases; 29.63%) for pre-pandemic; (22/75 cases; 29.33%) during the pandemic. Another endoscopic finding was bleeding, presenting in 2 patients pre-pandemic and 3 patients during the pandemic.

Table 2. Ingested Foreign Bodies*

Foreign Body	Pre-Pandemic		During the Pandemic	
	n	Percentage (%)	n	Percentage (%)
Coin	43	53.09	33	44.00
Dentures	18	22.22	26	34.67
Food Bolus	9	11.11	6	8.00
Chicken bone	2	2.47	3	4.00
Fishbone	2	2.22	2	2.67
Others	7	8.64	5	6.67
Metallic wire	1	1.23	-	-
Toothpick	1	1.23	1	1.33
Chico seed	1	1.23	-	-
Washer plate	1	1.23	-	-
Safety pin	1	1.23	-	-
Mangosteen seed	1	1.23	-	-
Sim card slot	1	1.23	-	-
Stone	-	-	1	1.33
Shrimp tail	-	-	1	1.33
Santol seed	-	-	1	1.33
Plastic button	-	-	1	1.33

*Comparison of the types and frequencies of foreign body ingestions before and during the pandemic, with coins being the most commonly ingested object in both periods, followed by dentures. During the pandemic, the percentage of coin ingestion decreased while denture ingestion increased notably.

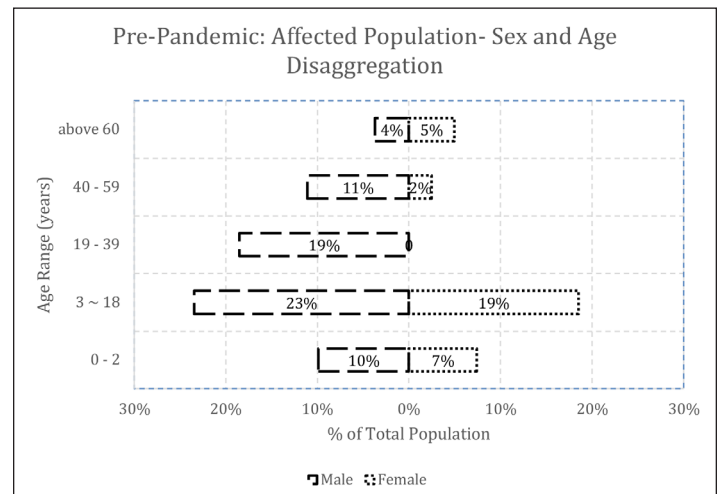


Figure 1. Population pyramid for the pre-pandemic period, with majority of patients in the age range of 3-18 years old followed by age range of 19-39 years old. Except for those above 60 years of age, there was male predominance in all the other age groups.

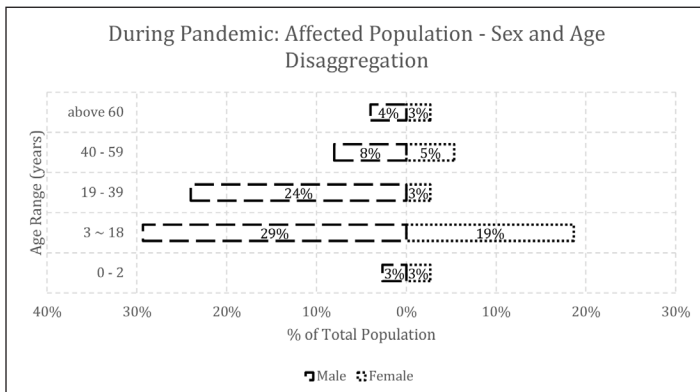


Figure 2. Population pyramid for during the pandemic period with majority of patients in the age range of 3-18 years old followed by age range of 19-39 years old. Except for age range 0-2 years old, there was male predominance in all the other age groups.

Majority of patients had no post-operative complaints, (55/81 cases; 67.90%) pre-pandemic; (40/75 cases; 53.33%) during the pandemic. The most common complaint was odynophagia with 26/81 cases (24.30%) pre-pandemic and 33/75 (30.56%) during the pandemic. Another post-operative complaint was dysphagia, noted only by 2 patients during the pandemic. All patients were discharged well both pre-pandemic and during the pandemic.

Analysis of patient clinical data showed that the median time (in hours) between consultation and discharge was 44 hours (IQR = 9 hours) pre-pandemic and 49 hours (IQR = 22 hours) during the pandemic with the longest time prior to consultation of 115 and 166 hours, pre- and during the pandemic. Correlation analysis showed that for pre-pandemic patients, age had a moderate positive correlation with operative time (Pearson correlation coefficient = .486, p-value <.05) and moderate to strong positive correlation with level of foreign body in the esophagus (Pearson correlation coefficient = 0.613, p-value <.05). For patients during the pandemic, correlation analysis showed that age had weak positive correlation with both operative time (Pearson correlation coefficient = .184, p-value of .114) and level of foreign body in the esophagus (Pearson correlation coefficient = .143, p-value of .257). A Chi-square test of independence showed no significant difference in the distribution of ingested foreign body types between the pre-pandemic and pandemic periods ($\chi^2 = 107.90$, df = 150, p = .996).

Time from ingestion to consultation showed a borderline statistically significant difference using t-test between the pre-pandemic and pandemic periods with t-value = -1.967 and p-value of .051. On the other hand, time from consultation to operation revealed a significant difference between the pre-pandemic and pandemic having a t-value of -2.037 and p-value of .043. Time from operation to discharge, however, did not show a statistically significant difference between the two periods, with t-value = -1.172 and p-value of .242. Lastly, time from

consultation to discharge revealed a statistically significant difference between the two periods, with t-value = -2.170 and p-value of .032. Meanwhile, independent t-test showed no significant difference between level of foreign body in esophagus (t-value = -0.771 and p-value of .445) and operative time (t-value = 0.621 and p-value of .536) before and during pandemic.

DISCUSSION

The COVID-19 pandemic had a great impact on Philippine hospitalization rates, management protocols and healthcare delivery worldwide. To limit the spread of the disease, the government of the Philippines restricted land, sea and air travel to and from Manila, and Negros Occidental, in accordance with the national government, also implemented its community quarantine.^{1,2} The findings of our study reflect this overall trend, highlighting significant changes in the demographics and outcomes of patients with foreign body ingestion before and during the pandemic.

Our study revealed a higher proportion of patients from Bacolod City in both periods, with a notable difference in age distribution. Ingestion of foreign bodies is a significant problem in all ages but is more common in younger children. Cases are more prevalent between ages six months and six years, being the stage of exploratory development.^{4,5} During the pandemic, the median age of patients increased, suggesting that younger children were less frequently brought to hospitals. Being a COVID referral center and the only government hospital offering esophagoscopy in the island, our institution noted a decrease in the number of pediatric patients seen with foreign body ingestion complaints. This could be attributed to concerns of parents about exposing children to COVID-19 in hospitals and travel restrictions, or may be due to the increased presence of parents at home leading to prevention of foreign body ingestion in their children.⁶ Male patients were more frequent in both pre- and during the pandemic periods, which aligns with existing literature indicating a higher occurrence of foreign body ingestion among males, particularly in younger age groups.⁷ The study also found that the majority of foreign body ingestion cases were in the pediatric age group, specifically children aged 0-10 years, both before and during the pandemic. This is consistent with global findings that young children are at a higher risk for foreign body ingestion due to their exploratory behavior and tendency to place objects in their mouths.^{8,9} Coins were the most commonly ingested foreign bodies in both periods, followed by dentures. This is consistent with literature indicating that coins are the most frequent objects ingested by children, while dentures are common among adults.¹⁰ Abrenica and Chua noted that the factors predisposing to foreign body ingestion in adults include eating,

ill-fitting dentures and sleeping with dentures.¹¹ Sadhu *et al.* identified that patients presenting with psychological or neurological deficits, maxillofacial trauma, drug overdose, and those undergoing general anesthesia have increased risk of foreign body ingestion.¹² Fishbone is another commonly ingested foreign body, impacting mostly in the oropharynx and esophagus.¹³

Correlation analysis for pre-pandemic patients showed that age had a moderate positive correlation with operative time, which means that older patients tended to have longer operative times. This is possibly due to underlying gastrointestinal tract conditions, such as esophageal stricture and reflux esophagitis, which affects the physiological function of the esophagus, and also predisposes patient to foreign body impaction and increases the risk for intraoperative complications such as esophageal perforation.¹⁴⁻¹⁶ Also, adult esophageal foreign bodies are usually large and sharp, that adhere to surrounding mucosa and become deeply embedded causing difficulty in extraction.¹⁷ There was moderate to strong positive correlation of age to level of foreign body in esophagus, which indicates that older patients tended to have foreign bodies lodged deeper in the esophagus, possibly due to esophageal motility disorders, which are more common in adults.^{15,18} For patients during the pandemic, however, correlation analysis showed that age had a weak positive correlation with both operative time and level of foreign body in esophagus, which implies minimal relationship between datasets. A Chi-square test of independence showed no significant difference in the distribution of ingested foreign body types between the pre-pandemic and pandemic periods which implies that the types of foreign bodies ingested remained relatively consistent despite the possible changes in healthcare access and health-seeking behavior brought about by the pandemic.¹⁹

The median time from ingestion to consultation increased during the pandemic, suggesting delays in seeking medical care were possibly caused by implemented quarantine and lockdown protocols. This implies that there might be a slight difference in the time patients took to seek medical help after ingesting a foreign body between the two periods, but it was not statistically significant. Median ingestion to consultation time increased from four hours pre-pandemic to seven hours during the pandemic, with extreme cases extending up to 190 hours during the pandemic. These delays were likely influenced by fear of COVID-19 exposure and changes in healthcare accessibility which deterred prompt medical consultation.¹⁹ That there was a significant change in the time taken to move patients from consultation to the operating room between the two periods possibly indicates changes in hospital protocols or patient flow during the pandemic. Despite this delay, the median time from consultation to the operating room remained the same at 15 hours, suggesting that the management

protocols were efficient once patients reached the healthcare facility. The t-test results showed a borderline significant difference in the time from ingestion to consultation between the two periods, indicating a potential impact of the pandemic on healthcare-seeking behavior. Although the median time remained the same at 15 hours, there was an increase in the number of patients with longer times from consultation to the operating room during the pandemic timeframe, with the longest time noted at 148 hours. This could be attributed to the delay in the release of COVID results during this time. The increase in number of patients with longer times from consultation to the operating room highlights the effect of the pandemic on hospital operations, possibly due to increased safety protocols, patient screening, and resource allocation. That there was significant increase in the duration from consultation to discharge during the pandemic possibly indicates potential impacts on patient monitoring protocols and hospital workflow.²⁰

The depth at which foreign bodies were found in the esophagus remained consistent regardless of the period and the duration of operations for removing foreign bodies remained consistent before and during the pandemic. The median operative times and the median level of foreign bodies in the esophagus remained consistent across both periods, indicating that the complexity of cases did not change significantly. This consistency in operative times differs from that reported in most Southeast Asian countries where the COVID-19 pandemic affected all surgical services of participating institutions to varying degrees.²¹ This may be also indicative of procedural efficiency at the CLMMRH. On the other hand, the moderate positive correlation between age and both operative time and the level of foreign bodies in the esophagus is consistent with the study that older patients might present more complex cases due to larger and potentially more impacted foreign bodies.²¹ The weak correlation between the time from ingestion to consultation and the other variables suggests that while delays in seeking care were noted, they did not significantly impact the surgical outcomes. This might be due to the prompt surgical intervention once the patients were presented at the hospital and can be effectively treated by an experienced surgeon with safe and uncomplicated removal of such foreign bodies.²² Delays in surgical intervention also did not significantly impact the outcome as majority of patients pre-pandemic and during the pandemic had no post-operative complaints and all were discharged well. The median time from consultation to discharge, as well as the number of patients with longer times from consultation to discharge, also increased during the pandemic, indicating extended hospital stay of patients implying added burden on limited hospital resources.

This study has several limitations due to its retrospective nature.



Data were obtained from existing medical records, some of which lacked standardized documentation. The study included only patients who sought hospital care and were admitted in the institution. There were also several changes in the hospital protocols during the COVID-19 pandemic which limited access to services during lockdowns and affected healthcare delivery. This study also did not include other confounding factors such as socio-economic factors and long-term outcomes and complications were not monitored.

Based on the findings, several recommendations are suggested to improve patient care and healthcare delivery during future crises of the same magnitude. Having increased public awareness about the risks of ingesting foreign bodies and highlighting the importance of timely medical consultation can reduce incidence. This study also recommends developing and implementing adaptable hospital protocols that can efficiently manage patient flow and resource allocation during pandemics or similar crises. Promoting the use of telehealth and remote consultations can reduce delays in medical consultations. Telehealth can provide an effective means for initial assessments, reducing the burden on healthcare facilities and minimizing exposure

risks. Conducting more research and monitoring of healthcare delivery and patient outcomes during a crisis will provide valuable data to refine and improve protocols, ensuring that healthcare systems are better prepared for future emergencies. By adopting these recommendations, healthcare systems can enhance their resilience and capacity to deliver quality care during crises, ultimately improving patient outcomes and healthcare delivery.

This study aimed to investigate the differences in patient demographics, clinical presentations, and outcomes of foreign body ingestion cases before and during the COVID-19 pandemic. The findings revealed significant impacts of the pandemic on hospitalization rates, patient management protocols and healthcare delivery.

In conclusion, the impact of COVID-19 pandemic on foreign body ingestion cases was noted in the increased overall time (ingestion to consultation, consultation to operating room and consultation to discharge) during the pandemic compared to the pre-pandemic period. Despite the consultation delays and limited hospital resources brought about by the pandemic, no significant morbidity was noted and all patients were discharged well, reflecting healthcare efficiency.

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