

# Retropharyngeal Sinus Tract Secondary to Glass Shard Impaction in an 8 Month-Old Child; Endoscopic Diagnosis Via Telescope Endoscopy And Management of Sinus Tract by Endoscopic Electrocauterization\*

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## ABSTRACT

### Objectives:

- To present a case of an 8 month-old female who ingested a foreign body that impacted itself into the posterior pharyngeal wall resulting in a retropharyngeal sinus tract
- To discuss the events leading to the diagnosis of the patient
- To explain the reason behind the difficulty of locating the foreign body during rigid esophagoscopy
- To discuss the use of endoscopic cauterization as management of the retropharyngeal sinus tract

### Methods:

**Design:** Case Report

**Setting:** Tertiary Government Hospital

**Patient:** One

**Results:** An 8 month-old female presented with repeated bouts of vomiting with associated refusal to eat. A chest radiograph showed a triangular radiopaque object at the level of T1-T2. Emergency foreign body extraction via rigid esophagoscopy was done, however, no foreign body was seen in the esophagus. An intraoperative chest radiograph showed a foreign body at the previously described location. On repeat esophagoscopy, a linear wound with purulent discharge on the posterior pharyngeal wall was seen. This wound was explored using a 0° telescope revealing a retropharyngeal tract measuring 2.4 cm in length. At the end of the

retropharyngeal tract, a glass shard was found and was extracted. This tract was monitored endoscopically 4, 18, 25, and 32 days post-operative, respectively for possible spontaneous closure of the tract. Eventually, after 32 days, noted to persist hence was debrided and was cauterized via electrocautery leading to its closure. Postop monitoring via flexible endoscopy and neck soft tissue lateral x-ray showed complete closure of the retropharyngeal sinus tract.

### Conclusion:

An 8 month-old female who ingested a glass shard was presented. The ingestion of pointed or sharp objects may be embedded into the retropharyngeal space and its further advancement may be caused by shearing forces caused by repetitive swallowing and vomiting. Immediate detection of these sharp foreign bodies may prevent formation of such tracts. Therefore, a high index of suspicion must be had in cases where foreign bodies that are not visualized by rigid esophagoscopy by careful inspection of the mucosal wall of the pharyngeal area with further guidance of radiographs. The innovation of endoscopic electrocautery as management of the sinus tract, inspired from the management of fourth branchial cleft sinus tracts, is an effective approach in management.

**Keywords:** foreign body impaction, endoscopic cauterization, sharp pointed foreign body

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## **CASE REPORT**

An 8 month-old female from Tondo, Manila consulted at the emergency room of a government hospital 1 week prior to admission due to vomiting. Though unwitnessed, the patient's parents claimed that the patient had ingested a foreign body. There was no dyspnea, stridor, or hematemesis. Parents claimed x-ray revealed a foreign body in the chest. Due to unavailability of instruments for extraction, the patient was advised to transfer to another institution.

A day later, the patient was brought to another government hospital where a radiograph revealed no foreign body results. The parents were then advised close observation. No medications were given and the patient was then sent home.

Interval history revealed persistence of vomiting and refusal to eat. No further consultation was done, no medications were given.

On the day of the admission, due to persistent bouts of postprandial vomiting, refusal to continue milk feeding and generalized weakness prompted consultation at our emergency room where a chest radiograph showed a triangular radiopaque object at the level of T1 and T2 (Figure 1.). Emergency foreign body extraction via rigid esophagoscopy showed no foreign body. Intraoperative radiograph showed the foreign body in the previously described location (Figure 2.). Repeat esophagoscopy with careful inspection of the pharyngeal wall revealed a linear wound cephalad to the right pyriform sinus. (Figure 3.) Using a 4mm 0° rigid telescope, the wound was explored, revealing a retropharyngeal tract (Figure 4.) This tract measured 2.4cm in length. At the end of the tract, a glass shard was found (Figure 5.). The glass shard measured 1.8 x 1.5 x 0.3 cm (Figure 6.). Intraoperatively, the patient was referred to Thoracic and Cardiovascular Surgery who suggested to do a possible esophagogram and Chest CT Scan with contrast. An endoscopically-guided nasogastric tube insertion was done to ensure that the tube would not be inserted into the above tract. Post-operatively, the patient was placed on NPO and was started on Ampicillin-Sulbactam 349 mg through IV every 6 hours and Paracetamol 68mg through IV every 4 hours as needed for fever. A series of

diagnostic esophagoscopies were done (4 times) and neck soft tissue lateral radiographs were done monitoring the retropharyngeal sinus tract of possible spontaneous closure (Figures 7 & 8). However, there was persistence emphysema in the retropharyngeal soft tissue lateral, hence subsequent wound debridement and cauterization were done when spontaneous closure was not observed. Two weeks postoperatively, flexible video endoscopy and repeat neck soft tissue lateral radiograph showed total obliteration of the opening of the retropharyngeal tract (Figure 9). A timeline of the course of the patient's monitoring is illustrated in Figure 10.

## **DISCUSSION**

Presented here is a rare case of a sharp foreign body which embedded itself posterior to the aerodigestive tract creating a retropharyngeal sinus tract. Only a few number of cases of retropharyngeal foreign body have been recorded in recent literature. The most recent case was reported in 2014 by Ziad and colleagues wherein a 21 year old male had complained of severe odynophagia 20 days after eating a chicken meal which resulted in a foreign body being lodged in the posterior wall of the oropharynx. Further workup revealed a sharp metallic foreign body in the retropharyngeal area with abscess formation. Eventually, it was revealed that the foreign body had migrated from the retropharynx to the mediastinum.<sup>[1]</sup> Mehta and colleagues also described a case wherein a foreign body was seen in a 45 year old male who complained of foreign body sensation in his throat. Radiographic examination of the head and neck revealed a metallic foreign body in the retropharyngeal area. However, since the patient was asymptomatic other than the complaint of foreign body sensation was noted, no further management was done and the patient was advised to follow-up after 3 months.<sup>[2]</sup>

Foreign body ingestion or impaction is commonly encountered in emergency room of the Department of Otorhinolaryngology-Head and Neck Surgery. This generally occurs in children between ages 6 months and 6 years.<sup>[3,4]</sup> Various presentations of patients with foreign body ingestion or impaction include vomiting, foreign body sensation, odynophagia, and dysphagia.



Ingested FB could be classified into certain types according to their features, including food bolus, blunt objects, sharp-pointed objects, long objects, and special objects (i.e., magnets, coins, and disk batteries).<sup>[3]</sup> Plain radiographs can be the most useful to investigate foreign bodies. Radiographs can demonstrate the location, number, size, and shape of foreign bodies. This may also exclude the presence of foreign bodies in airways in emergency situations. Due to increased density objects such as metal, glass and gravel are considered radiopaque, and multi-view, x-ray imaging is highly sensitive and specific when looking for these objects in soft tissues.<sup>[5]</sup> One limitation however is that some foreign bodies are not radiopaque subjects hence cannot be visualized in plain X-ray film. Any radiolucent foreign body may be located using an esophagogram or CT scan.<sup>[3]</sup>

In our case, two factors may have caused the further impaction of the foreign body. One would be due to the repetitive swallowing and vomiting of the patient while the foreign body was embedded in the posterior pharyngeal wall. Another would be due to the delayed extraction of the foreign body. In this case, the interval between the ingestion of the foreign body and its detection was approximately 5 days. Had the foreign body been extracted earlier, the further embedment of the foreign body may have been circumvented.

In the patient, rigid esophagoscopy missed the foreign body since it had impacted itself into the posterior pharyngeal wall and had already created a retropharyngeal sinus tract. Therefore, a careful inspection of this area should be done in cases where there is difficulty locating the foreign body especially if we are dealing with a sharp foreign body.

Approximately 80-90% of ingested foreign bodies pass through the GI tract spontaneously without complications, while 10-20% require endoscopic treatment and less than 1% require surgery. Possible complications of foreign body ingestion include impaction, perforation of the GI tract, mediastinitis which may eventually lead to death.<sup>[3]</sup> In this case, mediastinitis was a possible complication since the foreign body had been impacted in the retropharyngeal tract for approximately a week before it had been extracted.

Abscess formation which may lead to mediastinitis would have also been a possible complication in the patient had the foreign not been extracted.

In our patient, the retropharyngeal tract mimicked fourth branchial cleft sinus tracts which start at the pyriform fossa. This sinus tract, unlike branchial cleft sinus tracts which extend anteriorly to the skin of the anterior neck, was parallel to the esophagus. A series of diagnostic esophagoscopies and neck soft tissue lateral radiographs did not show spontaneous closure of the tract. This may probably be due to the eventual mucosalization of the sinus tract and infection of the tract. Without spontaneous closure of the opening of the sinus tract, we adopted the management of 4<sup>th</sup> branchial cleft sinus tracts using endoscopic electrocautery to obliterate the sinus tract's opening and applied it to this case.

In 2004, retrospective chart review evaluating the effectiveness of endoscopic cauterization as a definitive treatment for fourth branchial cleft sinuses done by Verret and colleagues, revealed no recurrence with an average follow-up of 3 years.<sup>[7]</sup> A multicentric review from 1998 to 2016 of pediatric patients who presented with an endoscopically-confirmed fourth branchial pouch anomaly was done by Rossi et al in 2019. It was their goal to determine the epidemiology and the predictive factors of success of the surgical management, both open and endoscopic techniques, of fourth branchial anomalies. The aim of endoscopic cauterization was to obtain a synechia of the ostium of the fistula. Result revealed a success rate of 86.8%, with no reported complications.<sup>[8]</sup> In a systematic review done by Lachance et al in 2016, wherein they concluded that endoscopic management (in which electrocautery was the method that was predominantly done) appears to be a safe and effective technique as a primary option for treatment of piriform sinus fossa sinus tracts.<sup>[9]</sup> In our patient, endoscopic electrocautery was done on the opening of the retropharyngeal sinus tract achieving closure of the retropharyngeal tract.

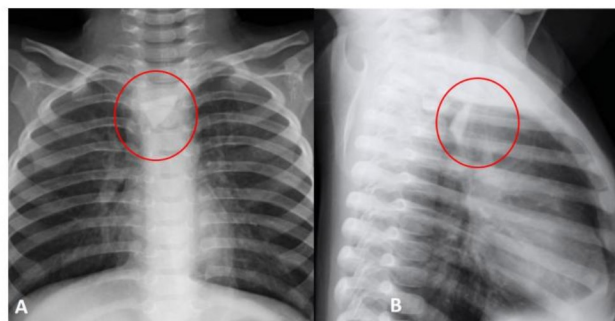
An 8 month-old female who ingested a glass shard was presented. The ingestion of pointed or sharp objects may be embedded into the retropharyngeal space and its further advancement



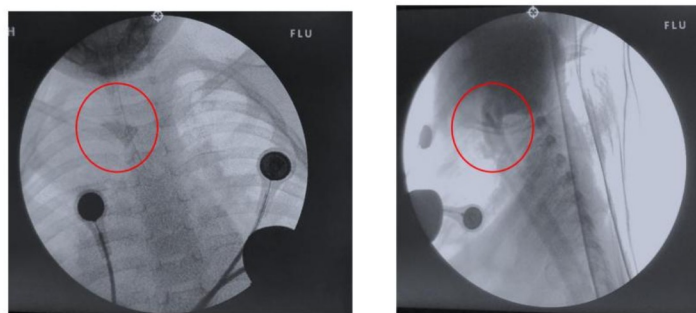
may be caused by shearing forces caused by repetitive swallowing and vomiting. Immediate detection of these sharp foreign bodies may prevent formation of such tracts. Therefore, a high index of suspicion must be had in cases where foreign bodies that are not visualized by rigid esophagoscopy by careful inspection of the mucosal wall of the pharyngeal area with further guidance of radiographs. The innovation of endoscopic electrocautery as management of the sinus tract, inspired from the management of fourth branchial cleft sinus tracts, is an effective approach in management.

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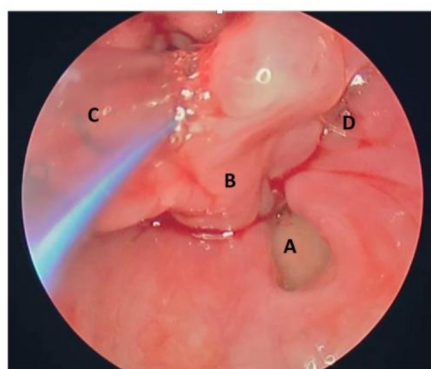
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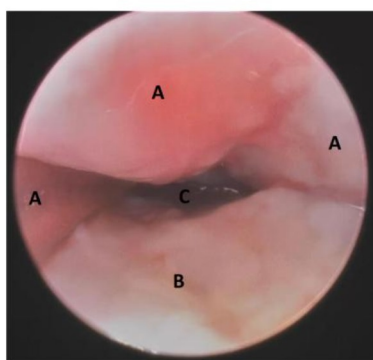
**Figure 1.** Plain Chest Radiograph. A. Anteroposterior view showing a triangular radiopaque object at the level of T1 and T2 B. Lateral view showing a triangular radiopaque object at the level of T1 and T2.



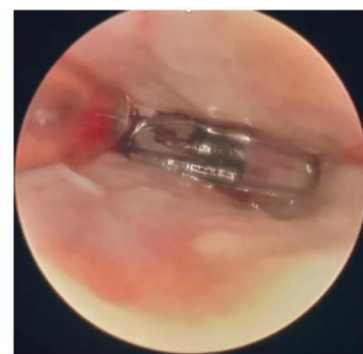
**Figure 2.** Intraoperative radiograph revealing the presence of the foreign body at the level of T1-T2



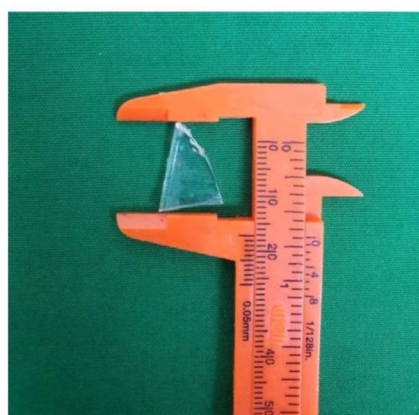
**Figure 3.** Rigid endoscopy of the hypopharynx revealing a linear wound in the retropharyngeal area. (A- opening to the retropharyngeal tract B-post-cricoid area arytenoid complex C- endotracheal tube D- pyriform sinus)



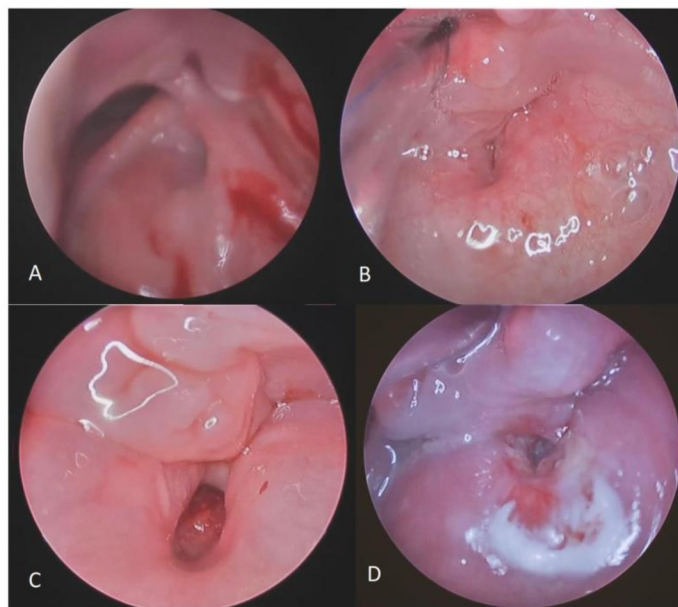
**Figure 4.** Rigid endoscopy of the retropharyngeal tract. (A- posterior pharyngeal wall B- prevertebral soft tissue C - lumen of retropharyngeal tract)



**Figure 5.** A glass shard at the end of the retropharyngeal tract.

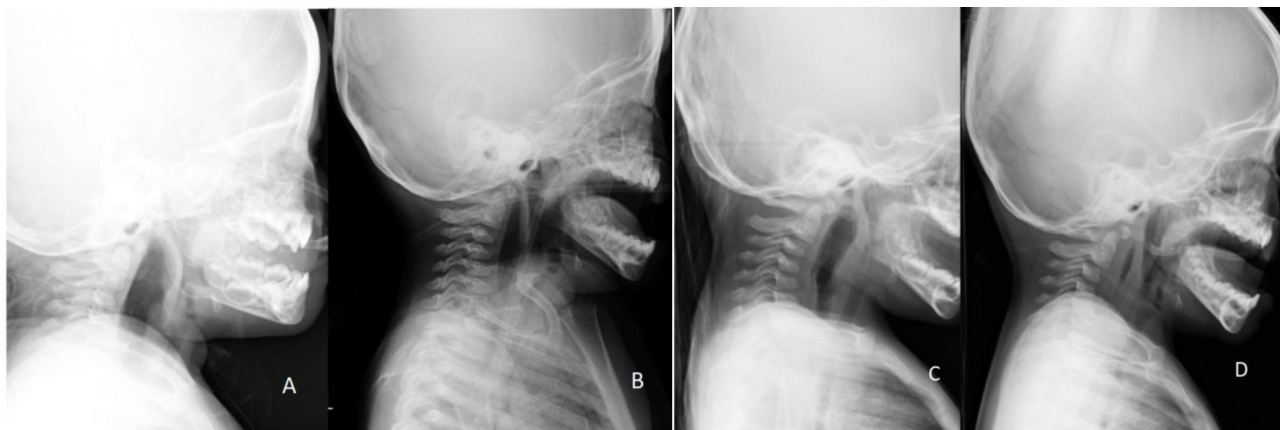


**Figure 6.** A glass shard measuring 1.8 x 1.5cm

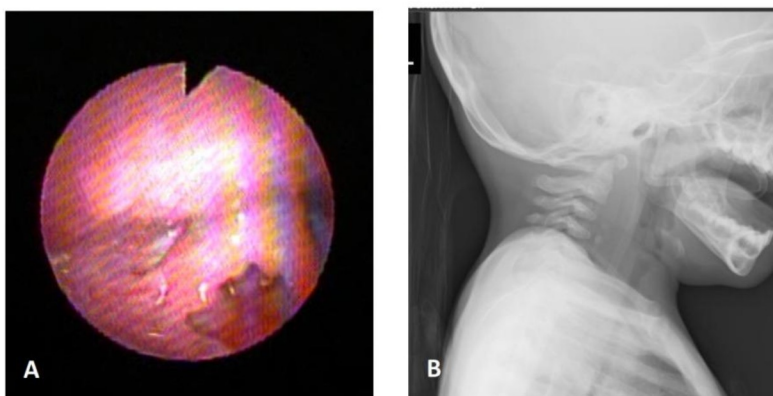


**Figure 7.** Series of diagnostic esophagoscopies post-extraction (A-Day 4 post-op, B-Day 19 post-op, C-Day 26 post-op, D-Day 32 post-op)

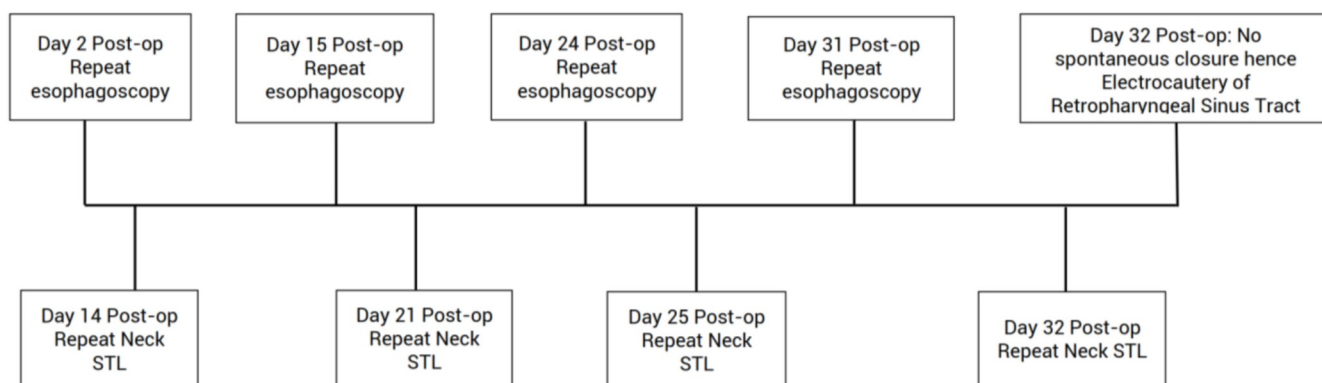




**Figure 8.** Series of neck soft tissue lateral radiographs post-extraction (A-Day 15 post-op, B-Day 21 post-op, C-Day 25 post-op, D-Day 32 post-op) There is persistence of retropharyngeal emphysema from post-operative Day 15 to 32.



**Figure 9.** Obliteration of opening of the retropharyngeal tract 2 weeks postoperatively (A. flexible video endoscopy B. Neck soft tissue lateral)



**Figure 10.** Timeline of series of diagnostic rigid esophagoscopies and neck soft tissue lateral leading to subsequent electrocautery of the opening of the retropharyngeal tract