Safe and Effective Management of Esophageal Coins with Bougienage

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Disclosures

We have no financial disclosures relevant to this presentation.
Objectives

1) Educate the members on the numerous ways in which to treat esophageal coins.
2) Educate the members on the value of integrating bougienage into an algorithm for esophageal coins.
3) Educate the members on how bougienage is performed for esophageal coins.

Background

Esophageal foreign bodies are common among children
Most common age 1 – 3 years old
Most common are coins and button batteries
Necessitate urgent management to prevent complications
- Esophageal perforation
- Tracheoesophageal fistula
- Mediastinitis
- Esophageal-aortic fistula

Type of Esophageal Coin

<table>
<thead>
<tr>
<th>Type of Coin</th>
<th>2010 US Mint</th>
<th>Esophageal Impaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quarter</td>
<td>5.8%</td>
<td>15%</td>
</tr>
<tr>
<td>Dime</td>
<td>18.75%</td>
<td>10%</td>
</tr>
<tr>
<td>Nickel</td>
<td>8.45%</td>
<td>11%</td>
</tr>
<tr>
<td>Penny</td>
<td>67%</td>
<td>64%</td>
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Clinical Phases of Foreign Body Ingestion

Initial stage – occurs at the time of ingestion
- Sings of choking, gagging, coughing, obstruction
- Calm as the foreign body lodges and reflexes grow weary

Asymptomatic phase
- Lasts hours to weeks
- Lead to delays in diagnosis

Complications phase
- Obstruction, erosion or infection lead to pneumonia, atelectasis, fever or dysphagia
- Mediastinitis, esophageal perforation or erosion into trachea

Common Locations of Esophageal Foreign Bodies

Esophageal foreign bodies 2x more common than bronchial foreign bodies

Common locations in the esophagus
- Cricopharyngeus muscle
  - Also known as upper esophageal sphincter
  - Level of the aortic arch or crossing of the left main bronchus
  - Gastroesophageal junction

Must ensure foreign body is not a button or a battery!!
Management Options

Observation
Endoscopy
  Rigid v Flexible
Foley catheter
Bougienage

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Observation of esophageal coins

Not performed at Children’s Hospital of Wisconsin
Observation typically limited 12 – 16 hours
Outpatient vs Inpatient
Risk of esophageal injury with lengthy observation
Can give child water or bread to aid with passage
Literature reports success in 25 – 30% of patients observed

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Endoscopy for Esophageal Coins

Most common means for coin and foreign body removal
Flexible vs Rigid esophagoscopy
Patient undergoes general anesthesia
Allows for assessment of the esophagus for injury
Reported complication rate of 2 – 3%
  Injury to the esophagus, complication from intubation and general anesthesia, aspiration
Foley Catheter

- Performed infrequently in the review of our patients
- Performed under fluoroscopy while patient is awake
- A foley catheter is advanced into the esophagus past the coin
  - Balloon filled with dilute contrast and withdrawn with the coin into the oropharynx
- Risk of coin aspiration, emesis with aspiration, injury to esophagus or epistaxis
- <2% risk of complications

What is a Bougie?

Bougienage

- Advances the coin into the stomach
  - Performed in the emergency department while patient is awake
- Must meet 5 criteria for bougienage
- Advantages
  - Decreased length of stay and cost of management
  - Low risk of complications
  - 94% success rate of advancing coins into the stomach
- No complications associated with Bougienage
Criteria for Bougienage

Single Coin  
Located below clavicles and above stomach  
Presented <24 hours after ingestion  
First episode of ingestion  
No esophageal abnormalities or prior esophageal surgeries  
No respiratory distress

CHW Management of Esophageal Foreign Bodies

Managed by ENT or Pediatric Surgery  
ENT manages all patients with endoscopy  
Pediatric Surgery  
   Bougienage in ED if meets criteria  
   Endoscopy for remaining patients
Study Patients

January 2003 to June 2012
All patients at CHW with a discharge diagnosis of an esophageal or airway foreign body

Data Collected
- Age and Gender
- Date and time of presentation and discharge
- Method of Removal
- Length of operation
- Complications
- Cost of hospitalization

1,642 children with an esophageal or airway foreign body
124 excluded

518 esophageal coin
516 ENT
116 successful
7 unsuccessful
11 did not meet bougie criteria

177 successful
13 qualified for bougie
3 complications

218 successful
58 qualified for bougie
3 complications

177 successful
13 qualified for bougie
3 complications

Length of Operation

Endoscopy Surgery: 60 minutes
Endoscopy ENT: 60 minutes

p value = 0.7662
Cost of Hospital Stay

Bougienage vs Endoscopy p value<0.0001

Length of Hospital Stay

Bougienage vs Endoscopy p value<0.0001

Conclusion

Bougienage is safe
  Low risk of complications
  No risks from anesthesia

Bougienage is cost effective
  Decreased hospitalization costs
  Decreased hidden costs from loss of work days
  Decreased hospital resource utilization
Thank You!

Questions

References


