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Percutaneous Gastrostomy Tubes
Prevention and Management of Complications

Gail Pearson, MSN, FNP-C
South Denver Gastroenterology
Disclosures

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Speakers Bureau: Salix, Clinical Area- IBS-D and HE
Educational Objectives

After attending this activity, participants should be able to:

• Identify indications and contraindications for percutaneous endoscopic gastrostomy (PEG)
• Identify potential complications
• Identify strategies for management and avoidance of complications
• Analyze clinical cases to improve diagnostic and treatment skills
PEG Tubes

• First used in 1980 in pediatric patients
• Modality of choice for long-term enteral nutrition
• Generally safe
• Can be associated with potential complications
• Based on Medicare claims data, PEG tube placement has increased over the years

PEG
Bumper or Balloon?

- Balloon – look for the inflation port
- Balloon replaced easily
- Easy removal with balloon
- Inadvertent removal higher with balloon
PEG With Bumper
PEG With Balloon

- Initially placed by IR
- Replacement tube
- May be replaced in clinic setting
Pigtail PEG
Two Main Indications

- Feeding Access
  - Temporary or chronic neurologic disorders/dysfunction
  - Traumatic brain, spinal injuries or polytrauma
  - Cerebrovascular disease
  - Prolonged coma
  - Head, neck and esophageal cancer
  - Neurologic diseases
  - Facial surgery

- Gastric Decompression
  - Chronic ileus/obstruction
  - Severe dysmotility
GJ Tube

- Patients at risk of aspiration
- SMA syndrome
- Regurgitation/Emesis
Contraindications

- Serious coagulation disorders
- Hemodynamic instability
- Peritonitis
- Severe ascites
- Abdominal wall infection
- Marked peritoneal carcinomatosis
- Interposed organs
- History of gastric surgery
- Severe gastroparesis (if being used for feeding)
- Gastric outlet obstruction (if being used for feeding)
- Lack of informed consent
Contraindications

- Dementia
  - A leading cause of death in the US
  - Mortality affected by aspiration, hydration and nutritional status
  - No studies showed definitive evidence to suggest long-term survival rates improved in patients who underwent PEG placement as compared to those who did not

Complication Rates

- Minor complications range from 13% to 40%
  - ~ 4% major complications
    - Carefully select patients
- Complication rates about the same for endoscopically compared to fluoroscopic placement
- 2013 retrospective study using US NIS analyzed data from 2006 – in-hospital mortality was 10.8% among 181,196 patient who underwent PEG

Early PEG Procedure Related Complications

- Complications of upper endoscopy and sedation
- Benign pneumoperitoneum – usually self-limited
- Perforation – damage to internal organs
- Aspiration
- Hemorrhage/bleeding
Pneumoperitoneum

• Common finding after PEG insertion
• As high as 50% in some studies
• Not generally considered a complication
• Related to air insufflation associated with the endoscopic procedure
• In absence of peritoneal signs should not prevent use
• Potential for bowel injury should be considered when free air persists 72 hr post-PEG insertion

Schrag et al. J Gastrointest Liver Dis. 2007.
Perforation/Internal Organ Injury

- Colon, small bowel, liver and spleen at risk
- Diagnosis can be challenging since many PEG candidates may not be able to communicate symptoms
- Watchful follow-up
- Plain films have limited utility
- CT for clinical concerns

Perforation/Internal Organ Injury

- **Colonic injury**
  - Transverse colon displacement
  - Usually present with peritonitis
  - Surgery often required

- **Small bowel injury**
  - Rare and difficult to diagnose

- **Gastro-colo-cutaneous fistula**
  - Interposition of bowel between anterior abdominal wall and gastric wall

- **Liver injury**
The Tube Went Through What?

- 36 yo female with TBI
- Hematoma after removal
- Careful assessment prior to removal
- Endoscopic removal preferred
Aspiration

• Upper endoscopy is associated with a risk of aspiration
• Small risk with procedure
• Pilot study of 50 patients – no evidence of pulmonary aspiration
• Aspiration pneumonia risk with tube feeding

Hemorrhage

- Rare following PEG placement
- Most controlled by pressure over the abdominal wound
- Endoscopy should be performed if significant bleeding
- May originate from the tract or from gastric ulceration
- Gastric wall and rectus sheath hematomas, retroperitoneal hemorrhage, gastric or superior mesenteric artery perforation
- Appropriate holding of anticoagulation agents
- SSRI use has been linked to bleeding

Case Presentation

- DB 17 yo cervical spine injury resulting in incomplete tetraplegia
- PEG placed 5/14/20 – stomach reported normal
- 5/18/20 UGI bleed – required 3 u PC
- EGD performed X 3 – large clot in stomach unable to be removed – no active bleeding visualized
Case Presentation

- EGD 2 weeks later – normal appearing PEG
- Suspected bleeding occurred from vessel at PEG site
Abdominal Wall Bleeding

- Usually soon after placement
- Puncture of an abdominal wall vessel
- Tighten external bolster
- Release within 48 hours
- Abdominal wall binder
Later Complications

- Bleeding
- Aspiration pneumonia
- Injury to internal organs
- Necrotizing fasciitis
- Buried bumper
- Tumor or viral seeding at stoma
Gastrointestinal bleeding

- Hematemesis
- Melena
- Coffee ground aspirate
- Laboratory abnormalities
- Causes: esophagitis, gastric pressure ulcers and concomitant PUD
Case Presentation

• 53 yo male C3-4 injury from MVA
• PEG placed for feeding access
• 5 weeks after placement nursing reported coffee ground appearing material in gastric aspirate – later developed melena – no NSAIDs
• H/H 10.2/33.4 (12.6/36.3) BUN 32 (22)
• EGD performed
Gastric Ulcer From the Pressure of PEG

- Ulcer at PEG site
- PEG exchanged to balloon tube
- BID PPI
- Repeat EGD 6 weeks later – ulcer healed
Aspiration Pneumonia

- Few at PEG placement – majority occur later
- Neurological diseases/TBI
- Avoid supine position
- Check gastric residuals
- G/J for those at highest risk
Necrotizing Fasciitis

- Rare but potentially fatal complication
- Rapid spreading infection
- Diabetes, wound infections, malnutrition and impaired immunity
- Traction, pressure and dislodged tube risk factors
- Erythema, tenderness, discharge, crepitus
- Treatment – immediate
  - Surgical debridement
  - Broad-spectrum antibiotics
  - Intensive care support

Buried Bumper

- Can occur early or late
- Serious complication occurring 1.5-1.9%
- Bumper lodged anywhere between gastric wall and skin
- Excessive tension
- Inadvertent tension

Case Presentation

- JM – 37 yo C4 spinal cord injury – incomplete tetraplegia
- 3 weeks post insertion – sluggish – would not flush or infuse, erythema and small amount of discharge, temp 104.2
- Labs: WBC 15, CRP 61
- CT – GT in abdominal wall with fluid collection
Buried Bumper
Buried Bumper
Case Study

- GT replaced by IR over guidewire
- Drain placed into fluid collection
- Antibiotics
Tumor or Viral Seeding

- Stomal site metastasis – tumor seeding of the PEG tract
- Viral seeding
- Alternate placement
- Exclude viral infections in patients with oropharyngeal and/or esophageal symptoms

Viral Seeding From Oral Herpes
Minor Complications

- Wound infection
- Hyper-granulation
- Leakage at stoma
- Dislodged tube
- Gastric outlet obstruction
- Clogged tube
Wound Infection

• Most common of minor complications
• Erythema – especially with extension, purulent discharge, signs of systemic inflammation
• Cultures limited value
• Prophylactic antibiotics reduce risk of infection
• If diagnosed early and mild – oral broad-spectrum antibiotics – local care
• If systemic signs IV antibiotics required
Hyper-Granulation

- Exact mechanism not known
- Suspected: friction, moisture
- Not life-threatening – uncomfortable and infection prone
- Wide variety of treatments
  - Topical antimicrobial agents
  - Silver nitrate
  - Steroid – triamcinolone 0.5% or clobetasol 0.05% 1-2 X daily for 7 days
Case Presentation

- 43 yo oral/facial injuries PEG placed 3 months prior
- Presented with drainage, pain, redness at site
- Securing PEG by hanging the end in necklace
- ~ 1.5 cm diameter
Case Presentation

- Clobetasol oint 0.05% applied BID X 1 week
- F/U hyper-granulation markedly decreased
- G Tube Holder
Gastrostomy Tube Holder

• Available from various online providers
Peristomal Leakage

- 1-2% reported – probably more common
- Can be associated with factors that hinder wound healing (diabetes, malnutrition, infection, gastric hypersecretion, excessive cleansing with hydrogen peroxide, side torsion on the PEG tube)
- Barrier skin protectant
- Avoid replacing the tube with a larger one – may cause the tract to continue to enlarge
Peristomal Leakage

- Antisecretory therapy to reduce gastric acid
- If leakage persists, the tube can be removed for 24-48 hr and replace through the same site if mature site
- If these measures fail – remove and replace PEG at another site
Dislodged Tube

- Inadvertent PEG removal occurs frequently
- If this occurs less than one month after placement – replace with endoscopy or by IR
- Avoid blind reinsertion – stomach may have separated from the anterior abdominal wall resulting in perforation
- Surgery consult if s/sx of peritonitis/sepsis present
Dislodged Tube

• If a mature tract
  – Verify position by aspiration
  – If there is any doubt water-soluble contrast study to confirm placement prior to restarting feeding
  – Binder may protect from inadvertent removal
Gastric Outlet Obstruction

- If external bumper slides forward the PEG bumper can migrate to the pyloric area resulting in gastric outlet obstruction
- Abdominal cramping, nausea and vomiting
- Maintain the position of the external bumper 1-2 cm from the skin
Clogged PEG

- Occurs in up to 45% of patients
- Prevention is key
- Flush 30-60 ml of water every 4-6 hours, after residual checks and after administering medication
- Dissolve medications completely or liquid forms

Clogged PEG

- Flush with warm water
- Carbonated beverages
- For formula clogs
  - Viokase 10,440 units lipase and one 325 mg sodium bicarb tab crushed and mixed in 5 ml of water. Introduce into the tube, clamp and wait 30 min before trying to flush
- Clog Zapper™
- Bionix® DeClogger – thin, flexible, polypropylene rod
- Bard PEG cleaning brush
Care After PEG Placement

• Studies have suggested that early feeding (~ 4 hours after placement) may be as safe as later feeding

• External bolster in proper position
  – At 7 days should be 1-2 cm in and out movement

• Cleanse daily with soap and water
  – Gauze not needed if no drainage

• Gastrostomy tube should be pushed forward and rotated during daily care

Removal

• Depends upon the type – if type can’t be determined endoscopy to determine what type of internal bolster is present

• Determine if the tube appears to be without induration, significant erythema or purulent discharge

• Ensure the bumper is in the gastric lumen
Removal

- Loosen the bumper – rotate the tube and push it forward into the gastric lumen a few cm
- If unable to do this – ? If there is buried bumper
- Palpate the abdomen (? Liver) – trajectory
- CT to examine position
Removal

- Buried bumper removal over guidewire – may need to be replaced and allow tube tract to mature before removal

- Once removed, cover the gastrostomy site with clean dressing – change dressing prn or every 6-8 hours until drainage stops

- Gastrostomy tract generally closes within 24-72 hours
Persistent Fistula

- No established method
- Tract lining disruption with brush or electrocautery with subsequent gastric mucosal endoclipping
- Gastric mucosal endoclipping alone
- May require surgical closure


References


• Williams E, Sabol DA, Delegge M. Small bowel obstruction caused by bowel wall hematoma after PEG. Gastrointest Endosc. 2003;57 (2) 273.