UNCOMMON COMPLICATIONS WITH PERCUTANEOUS ENDOSCOPIC GASTROSTOMY - OUR EXPERIENCE

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Abstract:
INTRODUCTION
Percutaneous endoscopic gastrostomy (PEG) is an alternative way to provide tube feeding for patients without a laparotomy. Although considered a safe procedure, immediate and delayed complications have been described. These complications vary from minor ones like wound infections to major life threatening complications like peritonitis and buried bumper syndrome. We present a series of uncommon complications related with PEG placement experienced in our center.

CASE SERIES 1.A, 48 year old female patient diagnosed to have carcinoma tongue arrived at our department with severe odynophagia and dysphagia. Underwent PEG for long term enteral nutrition access. Developed infection at stomal site. Imaging and endoscopy showed internal bolster buried in to abdominal wall. PEG tube was removed immediately and managed conservatively. Replacement PEG tube was placed 3 weeks later following peristomal wound site healing.

2.54 year old male with head injury underwent PEG for enteral nutrition, presented on 3rd day with abdominal distension and absent bowel sounds. He was suspected to have post-procedural ileus and was managed conservatively by bowel decompression (PEG tube was kept open till bowel sounds reappeared). PEG tube feeds restarted after recovery.

3. A 37 year old immunocompromised male patient with AIDS and MDR PTB developed tracheo-esophageal fistula, underwent PEG for nutrition. 2 months later presented with severe abdominal pain, fever and necrotizing fasciitis around the PEG site. PEG tube was in place in the epigastric area with signs of edema and erythema around the PEG site on the abdominal wall. Gastric contents were seen leaking around the PEG site. He was treated with parenteral broad spectrum antibiotics, removal of PEG tube and debridement. 3 weeks later after intensive management patient improved, PEG tube was reinserted.

CONCLUSION
PEG has become the modality of choice for providing long term nutrition. Though safe, it is associated with significant complications.
**Keyword** : PERCUTANEOUS ENDO-SCOPIC GASTROSTOMY, BURIED BUMPER SYNDROME, ILEUS, NECROTIZING FASCIITIS.

**INTRODUCTION:**

Percutaneous endoscopic gastrostomy (PEG) was first described in 1980 by Ponsky and Gauderer as an alternative way to provide tube feeding for patients without a laparotomy (1,2). It is considered as the modality of choice for long-term enteral access to variety of patients including those with neurologic deficits and swallowing disorder and those with oropharyngeal or esophageal tumors and various hypercatabolic states like burns, short bowel syndrome, and major traumas. PEG tubes have two main indications – feeding access and gut decompression (3). Absolute contraindications to PEG placement include pharyngeal or esophageal obstruction, active coagulopathy and any other general contraindication to endoscopy. Despite its good safety record, PEG can be associated with significant complications. These complications vary from minor ones like wound infections to major life threatening complications like peritonitis and buried bumper syndrome (4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19).

At our center a total of 25 PEGs were done between May 2011 and Feb 2014. 19 patients had neurological cause for dysphagia, 3 had laryngeal cancer, one had oral cancer and one patient was diagnosed with AIDS and MDR TB, developed tracheo-esophageal fistula. We hereby present 3 uncommon complications related to PEG placement experienced in our center followed by a discussion of its etiology, management, and prevention.

**CASE SERIES:**

A 48 year old female patient diagnosed to have carcinoma tongue arrived at our department with severe odynophagia and dysphagia. Endoscopy showed severe mucositis and edema. Of note patient had received chemotherapy and radiotherapy. She underwent PEG, as patient required further chemotherapy and anticipated to develop similar problems in future. 2 months later, she presented with fever, pain abdomen, swelling & thick, white discharge at PEG site. Abdominal exam revealed localised tenderness, erythema and induration at PEG site. Labs were unremarkable. Endoscopy showed internal bumper buried in PEG tract (fig 1) with lots of pus flowing from the tract.

<table>
<thead>
<tr>
<th>Minor complications</th>
<th>Frequency</th>
<th>Major complications</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peristomal infection</td>
<td>6.4 – 36%</td>
<td>Aspiration</td>
<td>0.3 – 1%</td>
</tr>
<tr>
<td>Ileus</td>
<td>1 - 2%</td>
<td>Hemorrhage</td>
<td>0 – 2.5%</td>
</tr>
<tr>
<td>Stomal leakage</td>
<td>1.2%</td>
<td>Peritonitis</td>
<td>0.3 – 1.5%</td>
</tr>
<tr>
<td>Inadvertent removal</td>
<td>1.6 – 4.4%</td>
<td>Buried bumper syndrome</td>
<td>0.3 – 2.4%</td>
</tr>
<tr>
<td>Gastric ulcer</td>
<td>0.3 – 1.2%</td>
<td>Necrotizing fascitis</td>
<td>Rare</td>
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<tr>
<td></td>
<td></td>
<td>Tumor implantation</td>
<td>Rare</td>
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<td></td>
<td></td>
<td>Visceral injury</td>
<td>Rare</td>
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<tr>
<td></td>
<td></td>
<td>Gastro-colo-cutaneous fistula</td>
<td>0 - 6.7%</td>
</tr>
</tbody>
</table>
Buried bumper syndrome was diagnosed and PEG tube was removed externally. Pain controlled, local wound care given. **Foley’s catheter was placed externally in track to maintain patency (fig 2).** Patient was hydrated, given broad spectrum antibiotics. Parenteral nutrition was given for nutritional rehabilitation. Replacement PEG tube was placed 3 weeks later following the healing peristomal wound site.

2. 54 year old male with head injury developed dysphagia due to neurological cause. Underwent PEG for he required long term enteral access for nutrition. He then presented on 3rd day with abdominal distension with discomfort. Abdominal examination showed **absent bowel sounds.** Routine lab values were normal and there was no evidence of leukocytosis or electrolyte imbalance. X-Ray abdomen showed **multiple air-fluid levels** (fig 3, 4). Patient developed **subacute intestinal obstruction probably due to post-procedural ileus,** he was managed conservative by bowel decompression, PEG tube was kept open till bowel sounds reappeared. PEG tube feeds restarted after recovery from ileus.

**FIG 3 : POST - PROCEDURAL ILEUS**
A 37 year old immunocompromised male patient with AIDS and MDR PTB developed tracheo-esophageal fistula, underwent PEG for nutrition with antibiotic prophylaxis. 2 months later presented with severe abdominal pain and fever.

Examination showed PEG tube was in place in the epigastric area with signs of edema and erythema around the PEG site on the abdominal wall. Peristomal site was inflamed with gastric contents were seen leaking around the PEG site (fig 5, 6). Skin surrounding the stoma developed necrotizing fasciitis. He was treated with intravenous hydration and parenteral broad spectrum antibiotics. PEG tube was removed and taken for debridement after stabilization. 3 weeks later after intensive management patient improved, PEG tube was reinserted.

**FIG 5: PERISTOMAL INFLAMMATION**

**DISCUSSION:**
Percutaneous endoscopic gastrostomy has become the procedure of choice for providing enteral access to patients who need long-term enteral nutrition. Despite its good safety record, PEG can be associated with significant complications. We hereby discuss the etiology, management and prevention of the above complications experienced at our center.

**BURIED BUMPER SYNDROME (BBS)**
BBS is the external migration of the internal bumper from the gastric lumen becominglodged in the gastric wall or anywhere along the gastrostomy tract. Current incidence of BBS ranges from 0.3% to 2.4%.

**Etiology:**
Can occur due to excessive tension between the internal and external bumpers or gastric acid causing alteration in the physical characteristics of the bumper. Inadequate PEG tube and patient care can also attribute to BBS. PEG tube characteristics which may predispose to BBS are - Small inner bumper, Sharp tapered flange, Hard plastic composition PEG tubes with balloon catheters carry no risk

**Risk Factors Associated with Buried Bumper Syndrome**

Obesity Rapid weight gain, in particular if loosening of the external bumper is not attended to Patient manipulation and pulling of the PEG Placement of multiple gauze pads or other coverings beneath the external bumper
Repositioning of the external bumper by inexperienced personnel. Chronic/severe cough, Frequent or inadvertent tube traction by caregivers.

**Treatment:**
Once recognized, a buried bumper should be removed even if the patient is asymptomatic. Can be removed using external traction or using endoscopy with or without balloon dilators \(^{(25,26,27,28)}\) or radiological methods with balloon catheters \(^{(30)}\) or surgical methods \(^{(29)}\).

**Possible Considerations in Preventing Buried Bumper Syndrome** \(^{(25)}\)
- Allow an additional 1.5–2 cm between the external bumper and the skin.
- Visualize the internal bumper (immediately following the PEG placement) to confirm its location prior to applying the external bumper.
- Once a day gently rotate and push the PEG in and out ~1–2 cm.
- Display simple diagrams of the PEG system at the bedside in the hospital or clinic.
- Length of the protruding external portion of the PEG should be measured periodically to recognize early migration.

**ABSCESS AND WOUND INFECTION**
PEG insertion is associated with a wound infection in up to 18% of patients who did not receive periprocedural antibiotics. Antibiotic prophylaxis reduces the infection rate to about 3% \(^{(31,32,33,34,35)}\).

**Etiology:**
Methicillin-resistant Staphylococcus aureus (MRSA) has emerged as an important cause of PEG-site infection, and a strategy of nasopharyngeal decontamination of patients with MRSA (in addition to standard prophylactic antibiotics) has been reported to significantly reduce the incidence of wound infections.

**Treatment And Prevention**
Most PEG wound infections will respond to a first generation cephalosporin or a quinolones. Administration of systemic prophylactic antibiotics before PEG placement reduces peristomal infection \(^{(36,37)}\).

**NECROTISING FASCIITIS**
Necrotising fasciitis (necrosis of the fascia layers) is a rare complication of PEG placement.

**Risk Factors**
Patients with diabetes, wound infections, malnutrition, and a poor immune system are at increased risk \(^{(39)}\).

**Etiology**
Traction and pressure on the PEG wound may predispose to the development of necrotising fasciitis. Patients who had their PEG tube external bolster set directly against the abdominal wall were more likely to develop wound infection, peristomal drainage, and fasciitis compared to patients whose external PEG bolster was left 3 cm from the abdominal wall \(^{(40,41)}\).

The microbiology of necrotizing fasciitis is complex. Multiple aerobic and anaerobic microorganisms display synergy and are responsible for the lethality of this disease \(^{(45)}\).
Prevention And Treatment
Prevention of necrotising fasciitis is imperative since treatment requires large surgical debridement, antibiotics, and extensive hospital support. It is also important to make at least a 1 cm skin incision prior to PEG placement to avoid creating too tight a PEG tube tract wound once the PEG tube is pulled through the wound following PEG placement. Treatment requires wide surgical debridement, planned operative reassessment, antibiotics, and extensive patient support.

ILEUS
If the patient following PEG develops persistent abdominal distension and an absence of bowel sounds, a post-procedural ileus should be suspected. This may be more likely to occur in situations where significant pneumoperitoneum was present. If accompanied by pain, a gastrografin study utilizing plain films or CT should be performed to rule out perforated viscus. Prolonged ileus develops in 1-2% of cases after PEG placement. Here, supportive therapy is indicated, with gastric decompression and intravenous fluids. Electrolytes should be corrected and any medications that may contribute to an ileus should be minimized. Tube feeds should be held until the ileus resolves.

CONCLUSION:
Awareness of these complications and the use of preventive strategies can allow the endoscopist to maximize outcomes and to identify complications early. As with any invasive procedure, a thorough knowledge of indications, contraindications, and fundamental procedural steps constitutes the most important safety factor.

REFERENCES


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