PEG, PEJ or PEG-J: Which tube for which patient?

John Fang M.D.
University of Utah

Techniques

- Site vs. Delivery
  - Gastric
  - Jejunal
- PEG’s
  - Tips
  - Replacement
- Percutaneous Jejunal Access
  - PEGJ: PEG with Jejunal Extension Tube
  - DPEJ: Direct Percutaneous Endoscopic Jejunostomy
Gastric vs. Jejunal Feeding

**Gastric**
- More physiologic
- Formula
  - isotonic, hypertonic
- Infusion
  - continuous, bolus
- Less reliable
  - gastroparesis 30-70%
  - N/V
- ? ↑ Reflux/aspiration

**Jejunal**
- Less physiologic
- Formula
  - isotonic
- Infusion
  - continuous, ≤ 100 cc/hr
- More reliable
  - feed 1-2 days post-op
- ? ↓ Reflux/aspiration

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Gastric vs. Small Bowel Feeding

Table 5. Relationship Between Feeding Site and Incidence of Pneumonia, Controlling for 3 Clinical Variables and Aspiration (n = 428)

<table>
<thead>
<tr>
<th>Feeding Tube Site</th>
<th>Feeding Tube Site Only: Odds Ratio for Pneumonia (95% CI)</th>
<th>Feeding Tube Site Adjusted for 3 Clinical Variables: Odds Ratio for Pneumonia (95% CI)</th>
<th>Feeding Tube Adjusted for 3 Clinical Variables and Aspiration (% Pepstatin-Positive Tracheobronchial Secretions): Odds Ratio for Pneumonia (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1 vs stomach</td>
<td>0.78 (0.48-1.25), P = NS</td>
<td>0.73 (0.44-1.21), P = NS</td>
<td>1.18 (0.68-2.04), P = NS</td>
</tr>
<tr>
<td>D2-D3 vs stomach</td>
<td>0.48 (0.28-0.83), P = .008</td>
<td>0.52 (0.20-0.90), P = .020</td>
<td>0.87 (0.47-1.60), P = NS</td>
</tr>
<tr>
<td>D4-jejunum vs stomach</td>
<td>0.21 (0.08-0.58), P = .002</td>
<td>0.30 (0.11-0.83), P = .021</td>
<td>0.62 (0.21-1.87), P = NS</td>
</tr>
</tbody>
</table>

JPEN 2011;35:346-355
Jejunal feeding decreases GE reflux

Am J Gastro 2000;95:3439-43

PEG Tips

- Use safe track technique
- Ultrathin scopes
  - Significant co-morbidity
  - Oropharyngeal/ esophageal stenosis
  - Decreased sedation
- Spinal needle for obese patients
- External bumper does not have to be tight
- Can start feedings after 3-4 hours
Transnasal PEG placement in unsedated patients: a new technique

- **Background**
  - Oral route for PEG placement not feasible in H+N Ca, facial trauma, neurologic dz
- **Methods**
  - 2 reports, 35 pts
  - Used 5.9 mm ultrathin endoscope
  - Standard PEG kits
  - No sedation used
- **Results**
  - Transnasal endoscopic PEG placement successful 33/35
  - Procedure time 9.5, 15 minutes
  - No complications

Vitale Endo 2005;37:48-51
Dumortier GI Endo 2004;59:54-57
PEG site metastases

- Up to 1% incidence
- DDx granulation tissue
- Portends poor prognosis
- Mechanism: ? Direct seeding, hematogenous
- Consider alternative methods i.e. IR, Russell introducer

Cruz GI Endo 2005;62:708-11

Russell Introducer Method

- Technique
  - Gastropexy’s performed
  - Dilator with peel-away introducer over guidewire
  - G-tube passed through the introducer→ peeled away
- Introducer kit
  - Gastropexy device
  - Serial dilator
- Allows endoscopic PEG in upper aerodigestive cancers

Maxwell, Fang JPEN 2011;35:630-5
PEG replacement

• After stoma tract maturation 1-2 wks
• Grasp + pull
  – Deflate balloon 1st
• Measure stoma tract
  – For low profile only
• Insert replacement tube
• Confirm position
  – Aspiration/auscultation
  – Fluoro
  – Endo

Indications for Jejunal Access

• Gastric abnormalities
  – Gastroparesis
  – Previous gastric resection
  – Gastric outlet obstruction
  – Inability to place PEG
• Pancreatitis
• Feeding intolerance
• Improved nutrient delivery
• Aspiration
  – Intolerance to PEG
  – GERD
• When expertise available
PEG-J

- **Indications**
  - enteric feeding
  - gastric decompression
  - \( \geq \) 30 days
- **Technique**
  - PEG: 18-28 Fr
  - J-tube: 9-12 Fr
  - fluoro useful

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**Through the Scope**

- **Technique**
  - 28 Fr PEG or stoma
  - \( \leq \) 6 mm scope to intestine
  - wire in, scope out
  - J-tube over wire
- \( \leq \) 100% to jejunum
- \( \geq \) 12 minutes

Clip Assisted PEGJ

• Resolution clip
  – Can be opened and closed multiple X’s
  – Use as forceps
  – Use to anchor
• Similar method for NET’s
  – +/- fluoro


Clip Assisted PEGJ
PEG-J Outcomes

- 10 series, 231 patients, 16-300 day follow up
- Morbidity
  - malfunction 54%; ~ 2 mos; clog, kink, leak, move
  - bleeding ≤ 23%
  - miscellaneous 22%, infect, ileus, peritonitis, etc
  - aspiration 17% (0-100%), 82% with prior asp
- Mortality ≤ 25%; aspiration, peritonitis


PEG-J Outcomes

- Retrospective Peds study
- 85 patients
- Avg # replacements 2.2
- Avg survival tube 39 days

Fortunato Am J Gastro 2005:100, 186–189
**DPEJ**

- Technique
  - colon- or enteroscope
  - transilluminate jejunum
  - percutaneous puncture
  - tube insertion
- 68-100% success
  - improved post-surgery


**Advantages of DPEJ**

- Greater stability than PEGJ
  - Decreased migration, kinking, etc.
  - More distal jejunal access
- Larger diameter tubes
  - Better infusion/decompression
  - Less clogging
- Less morbidity than surgical Jejunostomy
DPEJ Placement

[Diagrams showing steps of DPEJ placement]
DPEJ Placement

Tips For Improving Success

- Trans-illumination
  - Easier in thin body habitus
  - Easier in post-surgical
  - Use transillumination on endoscope
- Site Identification
  - Must have both transillumination and indentation
  - Fluoroscopy
- Clear stoma path
  - Use safe track technique
- Small bowel peristalsis
  - Glucagon
  - General anesthesia
DPEJ Outcomes

- 307 attempts 286 patients
- Results
  - Success 68%
    - Failed transillumination ~ 70%
    - SBO ~30%
  - Morbidity 22.5% AE’s
    - severe 4.2%; perforation, volvulus, bleed
    - moderate 5.9%; E-C fistulae, pain, serious infection
  - Mortality 1 (mesenteric bleeding)
- Conclusion
  - Significant complication rate
  - Comparable to surgical J
  - Less re-intervention that PEGJ

Maple Am J Gastro 2005;100:2681-88

PEGJ vs. DPEJ

Fan AC. GI Endo 2002:56;890-894
Fang  DDW 2003
PEG vs. DPEJ

• DPEJ will decrease reflux and decrease aspiration risk
  – Hypothesis: More distal and reliable jejunal feeding less likely to ↑ reflux and ↑ aspiration risk
  – Suggestive data from NET/critical care population
  – No reflux of Ba instilled by DPEJ

Change in aspiration events with DPEJ

• Before DPEJ
  – 33 total
  – Range 1-6
  – Mean 3.0 ± 0.426
• After DPEJ
  – 3 total
  – Range 0-2
  – Mean 0.272 ± 0.195

\( p < 0.0001 \)
Feeding Tube Outcomes

before Fang  after Fang