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Percutaneous Endoscopic Jejunostomy: indications, complications and ethics

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Enteral Nutrition

- Short- and long-term delivery of nutrients and medications into the GI tract of patients who cannot maintain their needs with oral intake



Why use the gut?

If GI tract functional, use it!
Better clinical outcomes, including a lower rate of sepsis compared to parenteral nutrition

Heyland et al, JAMA 1998

Access devices

Short term access	Long term access
<ul style="list-style-type: none"> Feeding tubes <ul style="list-style-type: none"> Gastric Jejunal 	<ul style="list-style-type: none"> Percutaneous gastrostomy (PEG) PEG with jejunal extension (PEG-J) Direct percutaneous jejunostomy (DPEJ)

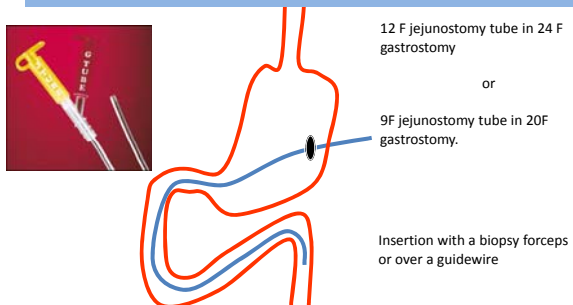
ASGE report, Gastrointest Endoscopy 2010

Indications

Gastric	Jejunal
<ul style="list-style-type: none"> Swallowing difficulties <ul style="list-style-type: none"> Neurological Facial trauma Mechanical obstruction Insufficient oral input <ul style="list-style-type: none"> Chronic diseases (COPD, CF) Cancer patients Decompression 	<ul style="list-style-type: none"> Gastric, duodenal obstruction Gastroparesis Acute pancreatitis Previous surgery in patients requiring EN (Roux-en-Y gastrectomy, By-pass, Whipple..)

ASGE report, Gastrointest Endoscopy 2010


PEG-J



12 F jejunostomy tube in 24 F gastrostomy
or
9 F jejunostomy tube in 20 F gastrostomy.

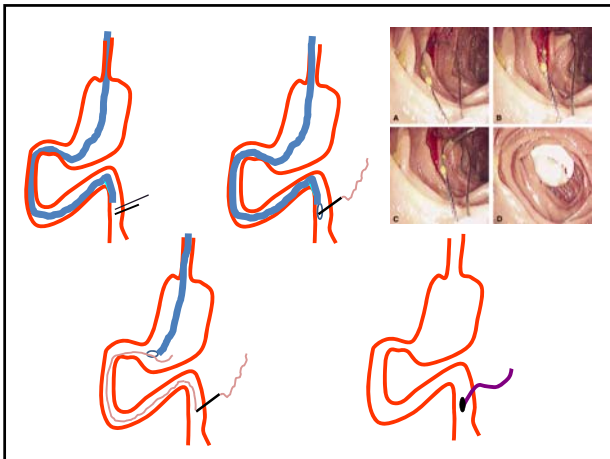
Insertion with a biopsy forceps or over a guidewire

DPEJ



Direct percutaneous endoscopic jejunostomy (PEJ)

- Enteroscope, pediatric colonoscope
- Transillumination/finger identification
- Fluoroscopic control
- Gastrostomy device (pull)



Largest series-Results

- First publications in 1991
- Largest series:
 - 307 procedures in 286 patients
 - Success rate: 209/307 (68%)
 - Higher rate of success in patients with altered anatomy

Table 3. Mechanisms for DPEJ Placement Failure

	Number (%)
Lack of adequate translumination/ finger indentation	79 (81%)
Absent	62 (63%)
Suboptimal, with an unsuccessful needle or trocar pass	17 (17%)
Unable to pass scope to jejunum	8 (8%)
Difficulty passing scope + lack of transillumination	6 (6%)
Adverse response to sedation	4 (4%)
Technical equipment failure	1 (1%)
Total	98 (100%)

Maple JT et al, Am J Gastroenterology 2005

Largest series-Adverse effects

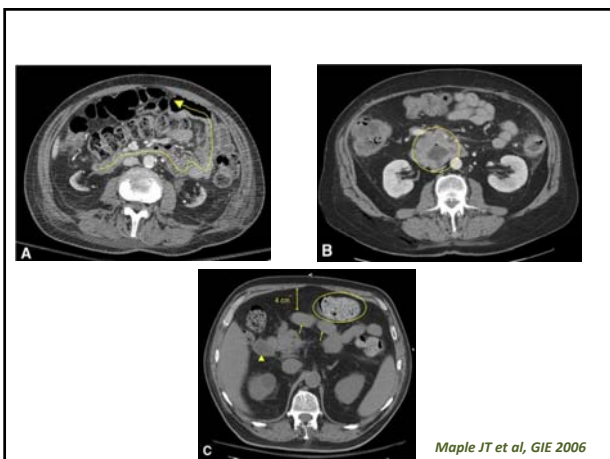
- Adverse effects in 69 (22.5%)
- Serious adverse effects (14 patients)(4.2%):
bowel perforations, jejunal volvulus, major
bleeding, aspiration
- Mortality (related to DPEJ insertion): 1 case
(0.3%)

Maple JT et al, Am J Gastroenterology 2005

CT as a predictor of success

- Failure in around 30% (higher than in PEG)
- Useful to have a tool for predicting success
- Retrospective study (n=115 patients)
- CT within the previous 30 days
 - Anatomical location of the second jejunal loop
 - Duodenal obstacle
 - Overlying structures
 - Ascites
 - Obesity (measurement of abdominal-wall thickness)

Maple JT et al, GIE 2006



Maple JT et al, GIE 2006

CT as a predictor of success

TABLE 3. Performance characteristics of abdominal CT for the overall prediction of success or failure of subsequent DPEJ

CT-predicted DPEJ outcome	Actual DPEJ outcome*		
	Success	Failure	Total
Success	45	18	63
Failure	30	20	50
Total	75	38	113

*Sensitivity, 60%; specificity, 53%; positive predictive value, 71%; negative predictive value, 40%.

TABLE 4. Objective measurements of distance correlated with DPEJ outcome

	Failures	Successes	P value
Mean AWT, mm	26.7	20.9	.018
Mean skin-to-jejunum distance, mm	40.5	33.2	.037
Mean jejunal loop depth from the abdominal wall, mm	13.7	12.2	NS



Maple JT et al, GIE 2006

Comparison to PEG-J

- Retrospective comparative study
- PEG-J: 49 and DPEJ:56
 - DPEJ: 20F feeding tube, PEG-J: 20F with 9F jejunal extension
 - Difference in patency
 - Reintervention in 19/49 (PEG-J) vs 5/56 (DPEJ), $p < 0.001$

Fan AC et al, Gastrointest Endosc 2002

DPEJ: which scope?

- Altered anatomy: Gastroscope
- Conserved anatomy: Enteroscope or paediatric colonoscope
- DBE: in case of failure of other scopes
 - Failure in 10/33 patients with pediatric colonoscope
 - Successful placement of DPEJ with DBE in all patients

Song et al, Gastrointest Endosc 2012

DPEJ: fluoroscopy?

- At the discretion of the endoscopist
- Altered anatomy: Useful for detecting afferent and efferent limbs

PEJ for gastroparesis

- Selected group: patients with previous lung transplantation and gastroparesis
- Mechanisms:
 - Risk of thermal or mechanical injury to the vagus nerve during the surgical procedure
 - Immunosuppression
 - Fundoplication applied as a treatment for GERD

PEJ for lung transplant patients

- Clinical data concerning all patients in whom a DPEJ was scheduled between 10/2008 and 5/2011 were retrospectively analysed
- 12 patients with 14 PEJ attempts
- Mean BMI: 17 kg/m²
- Mean FEV1: 0.83 L
- Under general anaesthesia and antibioprohylaxis
- Enteroscope or paediatric colonoscope

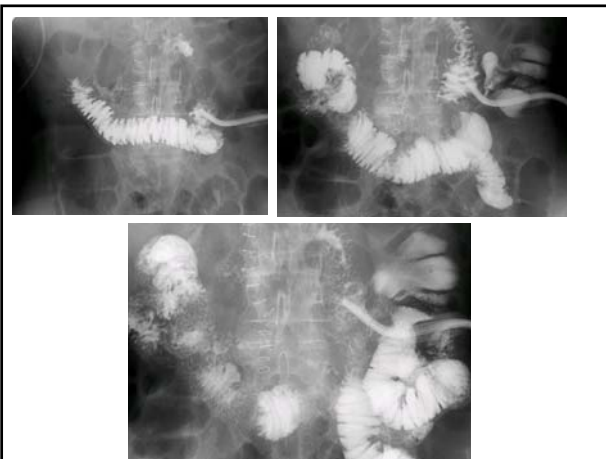
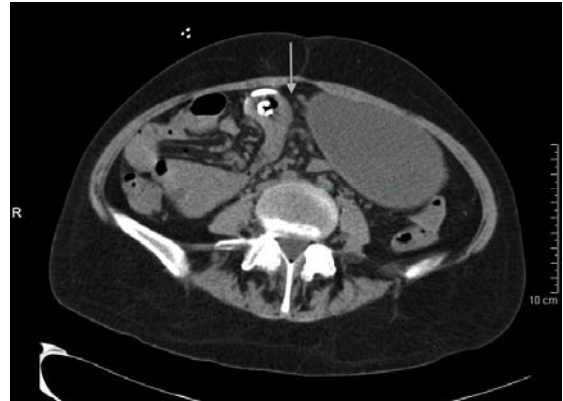
Toussaint et al, Endoscopy 2012

Results

- Technical success: 11/14 (78.6%) of procedures
- Technical failure because of lack of transillumination and finger indentation, despite optimal progression
- 18 French tubes with internal bumper
- Enteral nutrition well tolerated
- Mean duration of enteral nutrition: 20 weeks (2-44)

Complications

- No immediate complications
- 4/11 long term complications (36.4%), 2 severe
 - Jejunal volvulus requiring surgery and reduction (2 weeks after PEJ insertion)
 - Jejunocolonic fistula revealed after 44 weeks



Complications (overall)

- Procedure related:
 - Sedation-related AE (1.5%)
 - Aspiration pneumonia (1%)
 - Bleeding (1%)
 - Perforation of another organ (1.4%)
 - Peritoneal leakage (1%)
 - Pneumoperitoneum (clinical implication?)

Maple JT et al, Am J Gastroenterology 2005

Complications (overall)

- Related to tube insertion:
 - Pain (4.5%)
 - Infection (8%)
 - Granuloma (2%)
 - Leakage of the tube
 - Jejunal volvulus (related to rotation of the tube)(1%)
 - Jejunocolonic fistula (1%)
 - Enterocutaneous fistulas after retrieval (3%)

Maple JT et al, Am J Gastroenterology 2005

Complications (overall)

- Related to enteral nutrition:
 - Aspiration pneumonia (less frequent than PEG) (3%)
 - Diarrhea, abdominal pain
 - Dumping syndrome

Maple JT et al, Am J Gastroenterology 2005

4 basic principles of Bioethics

- **Autonomy:** Autonomy is self-determination or the ability to govern oneself
- **Beneficence:** Beneficence is the concept that an intervention should provide benefit for the patient.
- **Nonmaleficence:** Maleficence is an act by an individual in a position of trust that is unwarranted and harmful. Nonmaleficence is the deliberate avoidance of maleficence
- **Justice:** Justice involves the concept of fair and equitable resources to all.



Artificial nutrition should be considered as medical treatment

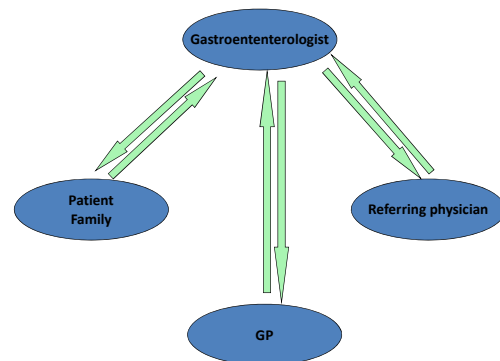
AMA, 1986

But.....

- Different cultural religious beliefs

To make decisions easier:

- Emphasize that artificial nutrition is not equivalent to feeding (legally and ethically)
- Unlike provision of food, artificial nutrition is associated with uncertain benefits, as well as considerable risks and discomfort
- The goal of artificial nutrition is not to increase the patient's comfort
- Other alternatives should be clearly explained
- Decisions should be shielded from financial and regulatory pressures
- Advance directives should be encouraged



Conclusions

- DPEJ is an alternative technique for providing access for enteral feeding when gastric access is impossible
- Success rates are lower than PEG, because of failure to identify the puncture site (translumination)
- Predictive factors failure:
 - Abdominal wall > 3cm
 - Stomach in place
- Higher rate of complications
- Referral centres

Conclusions

- DPEJ insertion for hydration and feeding is considered a medical treatment
- Description of procedure, potential risks, alternative therapy
- Shared decision with patient, family, referring physician, weighing the risks and benefits and respecting cultural and religious beliefs

**Daily Challenges in Digestive Endoscopy
for Endoscopists and Endoscopy Nurses**
BSGIE Annual Meeting - 20/09 2012- Brussels

Percutaneous Endoscopic Jejunostomy:
ethical aspects, indications and complications.
Marianna Arvanitakis, Erasme Brussels

