ENTEROCUTANEOUS FISTULA – 3

Fistula: Abnormal communication between two epitheliazed surfaces
Enterocutaneous Fistula*:* Abnormal communication between bowel and skin

Etiology:

- 75%-80% occur as a postoperative complication
    - anastomotic leak(50%)*:* devascularization, systemic hypotension, tension at on anastomosis, anastomosis performed in diseased bowel
    - Inadvertent injury to the bowel (50%):
- 15% - 25% occur spontaneously
    - Crohn's disease (5%-50%) Fistulas occur in 20-40% of Crohn's patients with half of these being external. A result of transmural inflammation leading to adherence of the involved bowel to abdominal wall, microperforation, abscess formation and eventual fistula formation
    - Radiation, cancer, diverticular disease, appendix

Presentation:

- Classic postoperative presentation:
    - Prolonged ileus, febrile, erythematous wound
    - POD 7-10 purulence followed by enteric contents from wound.

Radiographic evaluation:

- CT with IV and oral gastrograffin contrast to evaluate for abscesses with or without percutaneous drainage
    - Subsequent abcessograms should be performed 2-5 days after drain placement and then weekly until drain is removed
    - Fistula are usually not demonstrated at the time of initial drainage, but become evident on subsequent abcessograms after the cavity has been cleared debris and decreased in size
    - Aggressive attempts to demonstrate a fistula at the time of initial drainage increases the risk of sepsis
    - A fistula should be suspected if drainage exceeds 30-50 ml per day after 2-3 days
- Fistulogram using gastrograffin contrast locate the fistula

Classification:

- Anatomic: The more proximal the fistula, the greater the fluid, electrolyte and nutritional deficit
- Output:
    - Low = less than 200cc/24 hours
    - Moderate = 200-500cc/24 hours
    - High = greater than 500cc/24 hours
    - Output is an independent predictor of patient death, but is not prognostic of eventual closure
    - Most useful in planning nutrition, fluid, and electrolyte management

Table 1: Significance of Anatomic and Physiologic findings	
Favorable	Unfavorable
Esophageal, duodenal stump, pancreatobiliary, jejunal, small leak, tract <2 cm, defect <1 cm^2	Gastric, lateral duodenal, ligament of Treitz, ileal, complete disruption, epithelialization, distal obstruction
Output does not prognosticate closure	Output does not prognosticate closure
Well nourished, no sepsis, transferrin >200 mg/dL	Malnourished, sepsis, transferrin <200 mg/dL
Appendicitis, diverticulitis, postoperative	Cancer, inflammatory bowel disease, foreign body, radiation

Complications:

- Fluid and electrolyte abnormalities:
  - Present in 45% of patients
  - Prior to advances in perisurgical care these abnormalities accounted for 78% of fistula related deaths with an overall mortality rate of 43% (Edmunds et al 1960)
- Sepsis:
  - 25% - 75% of cases
  - Most common cause of death in these patients. 85% mortality rate when not managed appropriately
- Malnutrition:
  - Compounded by sepsis
- Previous overall mortality rates were reported to be 43%. Recent studies have shown a 50% decrease

Treatment:

- Initial management:
  - Control drainage: Sump suction, Drain
    - Somatostatin analogues: Not proven to improve overall rate of fistula closure, but decrease flow and make fistula more manageable
  - Protect skin: Stomahesive appliances
  - Prevention of fluid and electrolyte disturbances
  - Prevent sepsis: Drainage of abscesses, antibiotics
  - Wound vac: Resolution in case reports, randomized studies needed
  - Adequate nutrition: enteral vs. parental (see table 2)

Table 2		
	Low Output (<200 mL/d)	High Output (>500 mL/d)
Form of nutrition	Enteral	Usually requires some or all of nutrition in parenteral form
Protein	1-1.5 g/kg/d	1.5-2.5 g/kg/d
Calories	Resting energy expenditure	Resting energy expenditure times 1.5
Lipid	Enteral, 20%-30% of total calories	Parenteral, 20%-30% of total calories
Vitamins	RDA, 2 times RDA for vitamin C	Two times RDA
Minerals	Not problematic	May be difficult, magnesium, zinc, potassium, sodium, bicarbonate

- Non operative management is recommended for 4-6 weeks. Fistula may close without further intervention. If surgery is necessary the patient will be optimized.
- 60%-75% will close spontaneously
- 90% of fistulas that will close do so in 1 month
- 10% will close after 2 months
- None closed after 3 months (Reber et. al.)

Crohn's disease

- Type 1 Crohn's ECF (area of active disease) rarely close spontaneously.
- Type 2 (at anastomosis in otherwise normal appearing bowel) can usually be managed medically.
- Infliximab has improved medical management of Crohn's ECF, now first line therapy.
- 94 patient randomized, double-blind, placebo-controlled study. 46% versus 13% complete response rate (Present, 1999)

Surgical management:

- Simple closure of fistula tract associated with 40% failure rate
- Entire length of GI tract exposed to evaluate for areas of distal obstruction
- Fistula tract excision and segmental resection of involved bowel
- Hand sewn, two layer end-end anastamosis recommended
- Abscess cavities drained
- Diversion if necessary
- Sump drains if necessary
- Secure abdominal wall closure essential
    - Musculocutaneous flaps if necessary

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