

Enteral Feeding Of The Critically Injured

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PREMISE:

“Feeding intolerance” is caused by localized distention at the enteral feeding site. Vagal reflexes trigger a “downhill spiral” of generalized distention, impaired respiratory mechanics, etc. Episodes of lethal bowel necrosis (1:1,000) following jejunal feeding may be similarly explained.

This is prevented by matching inflow to monitored peristaltic outflow from the feeding site.

SUBJECTS:

We duodenally fed 31 colectomy and 160 consecutive cholecystectomy patients @ \approx 100 kcal/hr. Simultaneous duodenal aspiration just proximal to the feeding site efficiently intercepted swallowed excess feedings, as well as air and digestive secretions. The degassed aspirate was filtered and “refed” manually, matching the initially impaired peristaltic outflow.

The monitoring and return of aspirate was recently automated.

STUDIES:

Hourly assays were performed for nitrogen balance, serum amino acids, and feedings (carbohydrate) in the aspirate,. The colectomy patients had X-ray motility studies initiated at 5 – 17 hours after surgery.

RESULTS:

Normal motility and absorption returned within two hours. Fed BaSO_4 traversed a secure anastomosis, to exit in a bowel movement within 24-48 hours of colectomy. Excess feeding was absent from the aspirate within two hours of surgery. All patients achieved positive protein balance within 2 - 24 hours, and elevated serum amino acids within 1 – 2 hours. Four colectomy & 160:160 consecutive “open” cholecystectomy patients were discharged within 24 hours of surgery. These subjects displayed the most rapid reported resolution of paralytic ileus, to date.

CONCLUSIONS:

“Feeding intolerance” is triggered by local distention at the feeding site. Titrating inflow to exactly match monitored peristaltic outflow from this site prevents the development of this iatrogenic complication, despite immediate feeding rates of >100 kcal/hr and initially impaired motility and absorption.

Efficiently aspirating swallowed air without removing digestive juices aborts paralytic ileus, permits earlier feeding. Earlier enteral nutrition accelerates wound healing and immune competence.

POSTCOLECTOMY X-RAY MOTILITY STUDIES

Patient #1

66 y.o. male had sigmoid resection for carcinoma.

Immediate fed via nasal feeding-decompression catheter @ 100 kcal/hr for 17 hours. BaSO₄ was instilled, the tube removed, and general diet tolerated. He had spontaneous bowel movement, with discharge <48 hours postop.



@4 hours - 21 hours postop
BaSO₄ in distal small bowel.



@12 hours - 29 hours postop
BaSO₄ has reached the
Transverse colon. Ring of
staples at the anastomosis.



@24 hours - 41 hours postop
BaSO₄ in rectum after
traversing the secure and
patent stapled anastomosis,.

Patient #2

54 y.o. woman had right hemicolectomy for Ca. Fed Immediately with feeding-decompression gastrostomy tube @ 300 kcal/hr for 18 hours (4,800 kcal). Five hours postop, 120 ml dilute BaSO₄ instilled over four minutes via the feeding channel.

First X-ray taken one minute later. Discharge at 24 hours postop after a spontaneous BM and tolerating a general diet..



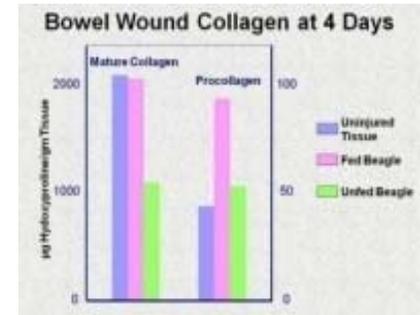
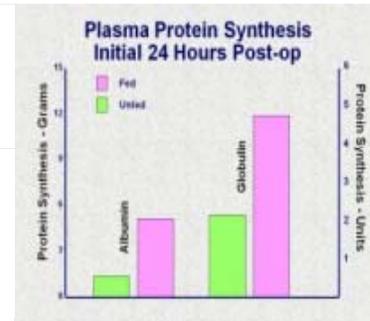
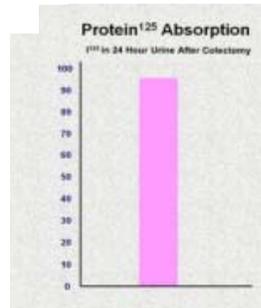
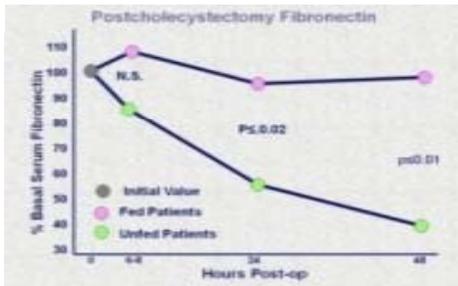
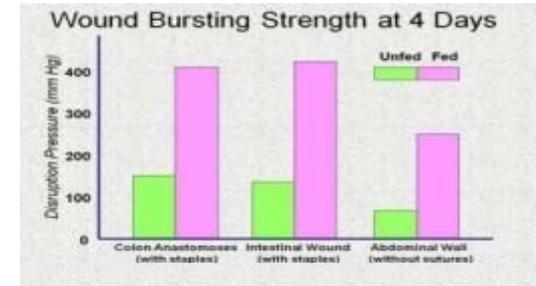
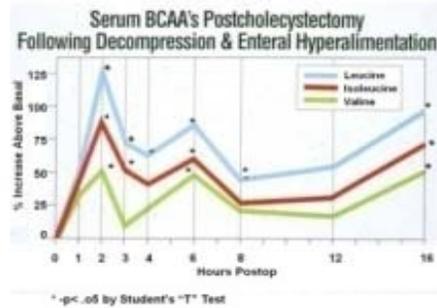
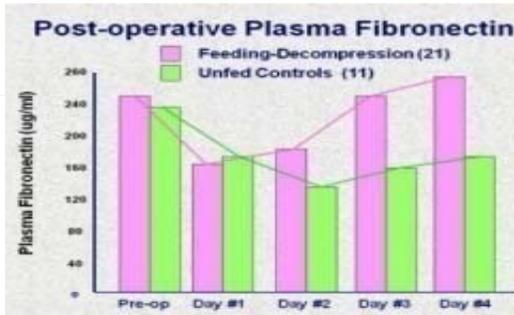
@5 min - 5 hrs postop.)
Note: No refluxing BaSO₄ escaped
aspiration to reach the stomach.



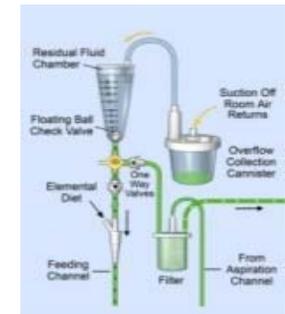
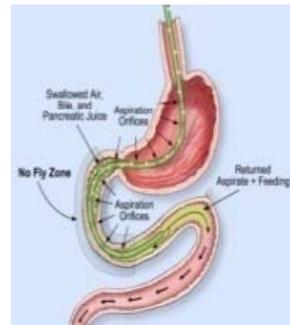
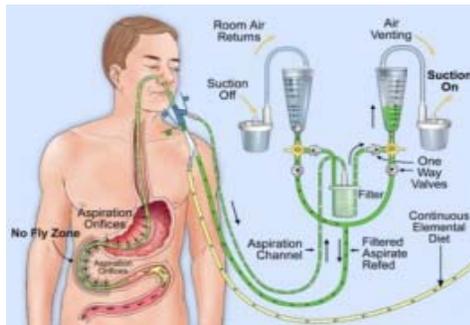
@4 hours - 9 hours postop)
Clinically normal motility. All BaSO₄
is in the distal small bowel.



@16 hours (21 hours postop)
Normal motility, BaSO₄ in the rectum.
Laxative effect of excess feeding.



Automatic Feeding Control & Monitoring of Peristaltic Outflow



Aspiration channel connected to burettes via one-way valves and filter. Feeding channel connected to burettes via one-way valves. Burettes connected via over-flow tubing to canisters on intermittent suction.

Inflow = Outflow
No excess or overflow
Air vented

Inflow > Outflow
Excess overflows
Air vented

Degassed aspirate "refed"
(maximum of 30 ml)