Hepatopancreatobiliary (HPB) Surgery

- A subspecialty of general surgery
- 1-2 year fellowship
- Surgical treatment of benign and malignant diseases of the liver, pancreas, biliary tree and upper GI tract.
- NOT transplant surgery,
  NOT surgical oncology
- AHPBA-certified fellowships

Objectives

- UNDERSTAND THE INDICATIONS FOR A WHIPPLE PROCEDURE
- UNDERSTAND THE TECHNICAL DETAILS OF A WHIPPLE
- IDENTIFY PERIOPERATIVE COMPLICATIONS AND THEIR MANAGEMENT
What is a Whipple?

- Pancreatectoduodenectomy
  - Head of the pancreas, portion of the bile duct, gallbladder and the duodenum are removed; +/- distal gastrectomy
  - The remaining pancreas, bile duct and stomach/duodenum are rejoined to the intestine
  - Vein reconstruction/resection
  - Arterial resection

Who Was Whipple?

- Allen Oldfather Whipple (1881-1963)
  - Professor of Surgery at Columbia
  - Was a multi-stage operation
    - First stage – relieve jaundice
    - Second stage – resect and reconstruct
  - Performed 37 in his LIFE

Indications

- Malignant Obstructions of the distal bile duct/head of the pancreas/duodenum
  - PANCREAS CANCER
  - CHOLANGIOCARCINOMA
  - AMPULLARY CANCER
  - DUODENAL CANCER
  - PANCREATIC NEUROENDOCRINE TUMOR
- Benign Obstructions
  - Pancreatitis
  - Trauma
Pancreas Cancer

- 45,220 cases/yr
- Rates of pancreatic cancer have been slowly increasing over the past 10 years.
- Approximately 10-20% are resectable at presentation.
- Best 5 year survival is 30-40% after multimodality treatment approach (chemo/RT/Surgery).
- Preop chemo/RT

Pancreaticoduodenectomy Specimen

- 4 – 8 Hours
- GT, JT, drains
- 30% complication rate
  - Delayed gastric emptying
  - Pancreatic fistula/leak
Preoperative Care

- Assessment of functional status
  - ECOG 0
  - ASA 3 (85%)
  - ASA 2 (15%)

- Assessment of nutritional status
  - Creon, gaining wt. (12% have lost 10% of body wt in last 6 months)

- Assessment of medical fitness
  - Glycemic control (25% diabetic)
  - Smoking cessation (20% smoke)
  - Checkroom air ABG

- Long, complex surgery with possibility of blood loss
  - Tc-Atl-99m-HgO
  - Central lines rarely used

Intraoperative Care

- Dedicated OR team of circulating RN, tech, and anesthesia provider

- Careful communication re: extent of surgery, equipment needs, etc.

- Careful positioning – arms out; padding of patient

- Bear-hugger, Hot-Dog, warmed IVF

- Frequent assessment of lab values

- Fluid restriction

- Avoidance of Transfusion
Fluid Restriction/Goal Directed Therapy

- Theory – decrease visceral and interstitial edema, avoidance of post-op hypervolemia
- No good data in pancreatic surgery
- Extrapolate from protocols used for liver resection
- Use Vigileo to Follow SVV
- Stroke volume variation = percentage of change between max and min SV over time divided by Mean SV

Fluid Restriction Phase

- 2/kg/hr crystalloid
- UOP Goal 20-44cc/hr
- Inotropic support prn
- Small fluid boluses for uop
- Watch SVV rise

100 kg male
- 5 hour restriction phase
- +1 L of crystalloid

Fluid Resuscitation Phase

- Begins once resection is completed
- 6cc/kg/hr of OR time Crystalloid
- Colloid to replace blood loss to normalize SVV 1:1
- Watch SVV return to baseline

100 kg male
- EBL 200
- 6 hour operation
- = 3600 + 250 cc of 5% albumin
Restrictive Transfusion Policy

- Perioperative transfusion is associated with worse oncologic outcomes in pancreas cancer patients.
- "upstages" the patient

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Whipple Transfusion Rate</th>
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<tbody>
<tr>
<td>St. Peters Hospital</td>
<td>10%</td>
</tr>
<tr>
<td>National ACS NSQIP</td>
<td>20.7%</td>
</tr>
<tr>
<td>Institutional Case Series</td>
<td>30-60%</td>
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</tbody>
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Postoperative Care

- Dedicated surgical unit – Monitored Beds
- Tele, O2 monitoring, End-tidal CO2, RT support
- Experienced RN’s – care for the patient throughout their entire stay
- Discharge planning/Teaching

Postoperative Care/Care Pathway

- Fluid restriction continues after initial resuscitation phase (POD #2)
- Early Feeding on POD #0/1
- Ambulation POD #0/1
- Urinary Catheter Removal POD #1
- Assessment of Drain Amylase 1/3/5/Early drain removal
- Assessment of Food tolerance
- Glycemic management
- Education
- PT/OT
- DVT prophylaxis (14 days after discharge)
- Discharge planning
- Home care vs. Rehab

Complications of A Whipple - 2015

- 30 day Mortality rate 1/40 2.5% (2.1%)
- Morbidity 17% [22.2]
- Delayed Gastric Emptying (DGE) 20% (18.5%)
  - Utilize G1/NGT/TPN/TF
  - Pro-kinetic Agents
- Post-op Pancreatic Fistula (POPF) 17% (17.17%)
  - Universal drain placement and early drain removal
  - Assessment of Drain Amylase on POD 1/3/5

Early Identification and Management of Complications/Rescue vs. Failure to Rescue
Complications of A Whipple - 2015

- Bleeding/Hemorrhage – delayed vs. immediate
- Medical Complications
  - Pneumonia 5%, Reintubation 2.6%
  - Wound Infection 10% (23.5%)
  - LOS 11 (11.9) days