Pancreaticoduodenectomy

A Valuable Surgery

Paul Montero PGY-III
September 11, 2006
Overview

- Brief History
- Perils of Early Pancreaticoduodenectomy (PD)
- Improvements
- Quality of Life after PD
- Widened Indications
- On the Horizon
History

- First successful local resection of peri-ampullary tumor performed by Dr. William Stewart Halsted in 1898

- First regional resection of peri-ampullary tumor performed in 1909 by Dr. Walter Kausch in Berlin

- Dr. Allen Whipple popularized the regional operative approach in 1935 at NY Memorial Hospital (Memorial Sloan-Kettering)
Pancreatic Cancer 2006

- As of 2006, cancer eclipsed heart disease as #1 killer in under 85 population

- Pancreatic cancer is the 4th leading cause of cancer related death for men and women

- American Cancer Society estimates for 2006:
  - 33,730 new cases
  - 32,300 deaths (400 in Colorado)

American Cancer Society, www.cancer.org
Don’t *Finagle* With the Pancreas!

- **1970s: PD results uniformly disappointing**
  - National mortality rate 20%
  - 5 year survivors rarely encountered

- Shapiro et al: Palliative Bypass vs. Whipple
  - Reviewed 17 papers ranging from 1962-1974
  - 497 pts with Panc head cancer; 20 5-yr survivors
  - Operative mortality ranged from 8-44%

Early Perils of PD

- Shapiro: “Such unusual patients should be subjected to resection in our opinion only if a knowledgeable surgeon is convinced cure is possible, if the procedure can be performed with a mortality less than 10% and if no obvious metastatic adenopathy is identified.”

Progress

- Volume – Outcome relationship
  - Reports of consecutive PDs without mortality
  - Larger patient pool for studies
- Improvements in care
  - Anesthesia experience
  - ICU experience
  - Support for MOF
  - Interventional Radiology
Volume-Outcome

“Practice makes perfect”
Luft et al. “Should Operations be Regionalized? The empirical relation between surgical volume and mortality.” NEJM 1979

Maryland in the 1980s:
- 45 hospitals performing Whipples (20% mortality)
- Hopkins performed <20% of Whipples (2% mortality)

Maryland 1994:
- Hopkins performed >60% of Whipples
- Statewide Mortality <5%

Hospital Volume and Mortality After Pancreatic Resection
A Systematic Review and an Evaluation of Intervention in The Netherlands

N. Tjarda van Heek, MD, * Koert F. D. Kuhlmann, MD, * Rob J. Scholten, MD, †
Steve M. M. de Castro, MD, * Olivier R. C. Busch, MD, * Thomas M. van Galik, MD, *
Huug Obertop, MD, * and Dirk J. Gouma, MD *

● Netherlands

Mortality Rates vs Hospital Volume

Referral Patterns

Progress in High Volume Centers

- 1968: 41 consecutive PDs without mortality
  - Howard et al. Hahnemann Medical College, Philadelphia

- 1990: 118 consecutive PDs without mortality
  - Trede et al. Heidelberg University, Germany

- 1993: 145 consecutive PDs without mortality
  - Cameron et al. Johns Hopkins, Baltimore

- Decreased median OR time (8.8h in 1970s to 5.5h in 2000s)
- Decreased hospital stay (17d in 1980s to 9d in 2000s)
- **Mortality rate of 1%**
- 5 yr survival:
  - Overall = 18%
  - LN neg pts = 32%
  - LN neg, Margin neg pts = 41%
- Complication rate = 41%
  - Delayed Gastric Emptying = 18%
  - Pancreatic Fistula = 12%

Panc Ca 5 yr survival in 2000 = 4%*

Technique Critique

- Pancreaticojejunostomy vs pancreaticogastrostomy
- Pylorus-preserving vs. Classic Whipple
- Octreotide
- Pre-operative Biliary Stent
Quality of Life After PD

- Inherently Subjective
- Surveys and Questionnaires
  - Limited Participation
  - General, Cancer Specific, Pancreas Cancer Specific
  - Reliability and Validity tested
- Control Group?
  - Cholecystectomy
    - Similar incisions
    - Readily available population
    - GB removal common to both groups
Quality of Life

- Difficult to define and measure

- Dr. Wright: “Whether or not American Idol is in season…”

She bangs!
Quality of Life and Outcomes After Pancreaticoduodenectomy

John J. Huang, MD,* Charles J. Yeo, MD,* Taylor A. Sohn, MD,* Keith D. Lillemoe, MD,* Patricia K. Sauter, RN,* JoAnn Coleman, RN,* Ralph H. Hruban, MD,†‡ and John L. Cameron, MD*

From the Departments of *Surgery, †Oncology, and ‡Pathology, The Johns Hopkins Medical Institutions, Baltimore, Maryland

- Largest study: 192 PD survivors (>6 mos, 80% = PPPD)
  - vs 37 lap chole patients (age, gender matched)
  - vs 31 healthy controls (age, gender matched)

- 59% participation from PD survivors

- QoL survey
  - Visual analogue scale questionnaire
  - Validity and Reliability tested

### Table 3. OVERALL QUALITY OF LIFE ASSESSMENT

<table>
<thead>
<tr>
<th>Domains</th>
<th>PD Patients (n = 192)</th>
<th>LC Patients (n = 37)</th>
<th>Healthy Controls (n = 31)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical (15 Items)</td>
<td>78%</td>
<td>83%</td>
<td>86%</td>
</tr>
<tr>
<td>Psychological (10 Items)</td>
<td>79%</td>
<td>82%</td>
<td>83%</td>
</tr>
<tr>
<td>Social (5 Items)</td>
<td>81%</td>
<td>84%</td>
<td>83%</td>
</tr>
</tbody>
</table>

PD, pancreaticoduodenectomy; LC, laparoscopic cholecystectomy.
Quality of life was assessed by a visual analogue scale, with the highest score being 100% in each domain. There were no significant differences when comparing any of the groups.

**Similar QoL Scores for PD, LC, and Healthy Controls**

Functional Outcomes measured between PD and LC groups
- Differences noted in weight change, diabetes, foul stools, abdominal pain, thirst, fatigue

Subgroup analysis:
- PD for Panc Ca pts had lower physical (77%) and psychological (78%) scores.
- PD for chronic pancreatitis pts had lower physical (74%), psychological (80%), and social (79%) scores.
LC scores were physical (83%), psychological (82%), social (84%)

Quality of Life, Nutritional Status, and Gastrointestinal Hormone Profile Following the Whipple Procedure

Robin S. McLeod, MD, Bryce R. Taylor, MD, Brenda I. O’Connor, BSc, Gordon R. Greenberg, MD, Khursheed N. Jeejeebhoy, MD, Dawna Royall, MSc, Bernard Langer, MD, Toronto, Canada

- 25 PD (>6 mos, cancer free) vs 25 Cholecystectomy (no CBD procedures)
- 6 QoL instruments
  - Time-Exchange, Physician Global Assessment, GI Sx, GI QoL, Sickness Impact Profile, Direct Quest of Objectives
- Nutritional Assessment by blinded dietician
  - BMI, skinfold anthropometrics, Subjective Global Global Assessment
- GI Hormone Studies
  - Gastrin, somatostatin, insulin, pancreatic glucagon, enteroglucagon, pancreatic polypeptide

McLeod et al. University of Toronto

- No significant differences in QoL or GI function
- Nutritional status within normal limits in all subjects
  - Mean body wt lower in PD group, but still at or above IBW
  - Gastrin levels lower, sx of endocrine and exocrine deficiency in PD group (DM, greasy stools)

- “QoL is excellent in patients who remain free of disease”

- “Bad reputation for post-operative recovery of the Whipple patient is related to the cancer, not the operation”

No significant difference between groups in GI sx.

<table>
<thead>
<tr>
<th>Table III</th>
<th>Gastrointestinal Symptomatology</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Whipple Group</td>
</tr>
<tr>
<td></td>
<td>None</td>
</tr>
<tr>
<td>Dietary restrictions</td>
<td>17</td>
</tr>
<tr>
<td>Fullness</td>
<td>19</td>
</tr>
<tr>
<td>Fullness after eating</td>
<td>20</td>
</tr>
<tr>
<td>Burping</td>
<td>18</td>
</tr>
<tr>
<td>Heartburn</td>
<td>13</td>
</tr>
<tr>
<td>Vomiting*</td>
<td>24</td>
</tr>
<tr>
<td>Early dumping</td>
<td>24</td>
</tr>
<tr>
<td>Late dumping</td>
<td>24</td>
</tr>
<tr>
<td>Greasy stools</td>
<td>20</td>
</tr>
<tr>
<td>Jaundice*</td>
<td>25</td>
</tr>
<tr>
<td>Fever/chills*</td>
<td>23</td>
</tr>
<tr>
<td>RUQ pain*</td>
<td>21</td>
</tr>
<tr>
<td>Incisional pain*</td>
<td>22</td>
</tr>
</tbody>
</table>

*These symptoms were rated as "never/rarely/seldom/always."

RUQ = right upper quadrant.
Wider Indications

- **Chronic Pancreatitis**
  - Intractable pain, pancreatitis complications, suspicion for malignancy

- **Trauma**
  - Case reports of PD for pancreatic/duodenal injuries

- **Benign Lesions**
  - PD acceptable for suspicious/uncertain lesions
    - FB reaction to Fishbone
255 pts undergoing surgery for Chronic Pancreatitis PD (37%), Distal Pancreatectomy (25%), Puestow (19%), sphincteroplasty (14%)

No significant differences in mortality, survival, or complications


- Pre- and Post- op surveys returned by 109 pts (47%)
- QoL scores for enjoyment, pain, hospitalizations, usefulness, and overall health significantly improved
- Significantly decreased narcotics and alcohol use
Future

- Laparoscopic PD
  - Has been performed successfully, but generally deemed to have no benefit

- Chemotherapy
  - Neo-adjuvant
    - Downstaging tumor
    - Less intra-op dissemination
    - Better tolerated
    - Ensure completion of chemo
    - Observation period may prevent non-therapeautic laparotomy
Future

- Screening for Pancreatic Cancer
- Identifying at risk patients
- Evidence based adjuvant therapy
PD: A Valuable Procedure

- Mr. RL underwent PD 11/9/05
  - Complicated by PJ leak
  - Underwent 2 subsequent surgeries
  - Hospital Stay >50 days
  - Doing well, now living in FL