Classic Whipple versus Pylorus Preserving Pancreaticoduodenectomy

Sw Leichtle, C Kaoutzanis, NJ Mouawad, K Welch, V Hoshal Jr., E Kreske

Department of Surgery, St. Joseph Mercy Health System Ann Arbor
Pancreaticoduodenectomy

Resection

- Pancreatic head
- Gallbladder & CBD
- Duodenum
- Stomach (part)

Classic Whipple

All images: http://cancerhelp.cancerresearchuk.org/type/pancreatic-cancer/
Pancreaticoduodenectomy

Resection

- Pancreatic head
- Gallbladder & CBD
- Duodenum
- Stomach (part)

Suggested advantages

- Shorter operating time
- Decreased EBL & transfusions
- Improved weight gain
- Higher quality of life

Classic Whipple

Pylorus Preservation
Study Methodology

• CPT codes & ICD-9 codes, 2005 – 2010
  – Classic Whipple vs. pylorus preservation
  – Pancreatic cancer vs. other disease

• Outcomes of interest
  – Mortality, operative time, blood transfusions, major
    organ system complications, length of stay

• Propensity score model including 28 covariates
to adjust for differences in patient groups
Results: \( N (2005 - 2010) = 7,869 \)

\( N (\text{Pancreatic cancer}) = 4,206 \)

- **60%** Classic Whipple
- **40%** Pylorus Preservation
Results: \( N \ (2005 - 2010) = 7,869 \)

\[ N \ (\text{Pancreatic cancer}) = 4,206 \]

- Classic Whipple: 60%
- Pylorus Preservation: 40%

**Operative time\(^*\)**
- Classic Whipple: \( 394 \ (389 - 399) \) min
- Pylorus Preservation: \( 373 \ (367 - 379) \) min

\( P < .01^* \)
Results: $N (2005 - 2010) = 7,869$

$N (Pancreatic cancer) = 4,206$

Operative time*

- Classic Whipple: 394 (389 – 399) min
- Pylorus Preservation: 373 (367 – 379) min

$P < .01^*$

Mortality

- Classic Whipple: 2.20%
- Pylorus Preservation: 2.90%

$OR = 0.72, 95\% CI, 0.48 - 1.07, P = 0.10$
Pancreatic Cancer

Blood transfusions

Classic Whipple  Pylorus Preservation
1.0 (0.9 – 1.1) units  0.9 (0.8 – 1.0) units

OR = 1.12 (95% CI 0.97 – 1.31), P = .08
Pancreatic Cancer

**Blood transfusions**

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Units</th>
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<tbody>
<tr>
<td>Classic Whipple</td>
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OR = 1.12 (95% CI 0.97 – 1.31), P = .08

**Complications**

<table>
<thead>
<tr>
<th>Category</th>
<th>Probability</th>
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<tbody>
<tr>
<td>Wound</td>
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Pancreatic Cancer

Blood transfusions
Classic Whipple          Pylorus Preservation
1.0 (0.9 – 1.1) units   0.9 (0.8 – 1.0) units
OR = 1.12 (95% CI 0.97 – 1.31), P = .08

Length of stay*
Classic Whipple          Pylorus Preservation
12.8 (12.5 – 13.1) days  11.8 (11.5 – 12.2) days
P < .01

Complications

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Other Disease

Blood transfusions*

<table>
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<tr>
<th>Disease</th>
<th>Units</th>
<th>95% CI</th>
<th>P-value</th>
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<tbody>
<tr>
<td>Classic Whipple</td>
<td>0.8</td>
<td>(0.7 – 0.9)</td>
<td></td>
</tr>
<tr>
<td>Pylorus Preservation</td>
<td>0.5</td>
<td>(0.4 – 0.6)</td>
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OR = 1.56, 95% CI 1.30 – 1.88, \( P < .01 \)

Complication

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Length of stay

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\( P < .01 \)
Discussion

Patient Cohort

- NSQIP: 7,869 patients
- Most observational studies/RCTs: ≤200 pts
- Meta-analyses of clinical trials: ≤ 500 pts

Mortality

- Historically: 20 – 30%
- Contemporary studies: ~3 to 7% for both techniques

Operative time

- Reduction with pylorus preservation up to 1 hour
- Wide range: 4 – 14 hours
Blood transfusions
- Possibly higher blood loss with classic Whipple
- No difference in transfusion requirements

Length of stay
- Both techniques: 12 – 20 days (up to half year)
Discussion / Study Model

Blood transfusions

• Possibly higher blood loss with classic Whipple
• No difference in transfusion requirements

Length of stay

• Both techniques: 19 – 20 days (up to half year)

Strengths

• Question difficult to answer in RCT
• Relatively large patient cohort
• NSQIP
• Propensity score model

Limitations

• Procedure/disease specific outcomes not available, e.g.
  GI motility, oncologic outcome
• Intraoperative decision making not known
Conclusions

• NSQIP hospitals achieved excellent short-term outcomes after classic and pylorus preserving pancreaticoduodenectomy

• No significant differences between both techniques for postoperative mortality or major complications

• Small but significant advantages in resource and blood utilization with pylorus preservation