How I do it
Laparoscopic Pancreaticoduodenectomy

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Introduction

- Laparoscopic pancreaticoduodenectomy
  - First report in 1994, Gagner et al.
  - First laparoscopic PD in KOREA, 2004, Han et al.

- Challenging procedure, but slow propagation
- One of the most advanced abdominal operations due to the necessity of a complex dissection and reconstruction
Introduction

• Laparoscopic PD for surgeon
  – More easier approach to lap. PD than past decades
  – Different environment
    • Frequent and various exposure to advanced laparoscopic surgery
  – Accumulation of experience
  – Development of laparoscopic surgical skill and instrument
Introduction

• What is the most easy way to perform laparoscopic PD?
  – Easily reproducible procedure
    • Simplified operation
  – Well reflection on the difference of approach
    • Limitation on approach than laparotomy
  – Reduce time-consuming procedure
  – No significant difference from conventional PD/PPPD
Operative procedure

Gastric/Duodenal resection → Pancreatic transection → GDA ligation → Bile duct resection

Dissection from SMA → Jejunal resection → Kocher maneuver

PJ → HJ/CJ → GJ/DJ

RESECTION

RECONSTRUCTION
Key points

• Gastric/duodenal resection
  – Reduce time for dissection
  – GJ anastomosis using endo-stapler

• Dissection from SMA
  – Using endo-stapler
  – Using energy devices

• Pancreaticojejunostomy
  – Dunking method (two-layered)
  – Duct-to-mucosa
Resection of Stomach/Duodenum

- PPPD >> PD
  - In functional aspect, atrophic change of remnant pancreas and so on.
  - Intracorporeal DJ anastomosis: not easy for beginner

- SSPPD (subtotal stomach-preserving PD)
  - Resection 2~3cm prior to pylorus
  - Some reports
    - Reduce delayed gastric emptying than PPPD
    - Better functional performance than PD
  - Possible to apply endo-stapler for GJ

Hayashibe et al. J Surg Oncol. 2007
Dissection from SMA

• Using endo-stapler
  – Fast, easy
  – Careful firing to prevent SMA injury
  – Remnant pancreatic tissue

• Using energy devices
  – Precise dissection
  – Need more time than endo-stapler
Pancreaticojejunostomy

- Retrocolic
- Dunking method vs. Duct-to-mucosa
  - No difference in clinical outcome
  - Choice according to surgeon’s preference

<table>
<thead>
<tr>
<th></th>
<th>Dunking (Early period)</th>
<th>Duct-to-mucosa (Late period)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode</td>
<td>End-to-end</td>
<td>End-to-side</td>
</tr>
<tr>
<td>Layer</td>
<td>Two-layered</td>
<td>Two-layered</td>
</tr>
<tr>
<td>Outer layer</td>
<td>4-0 Prolene Continuous suture</td>
<td>4-0 Prolene Continuous suture</td>
</tr>
<tr>
<td>Inner layer</td>
<td>5-0 Prolene Interrupted suture</td>
<td>5-0 Prolene / PDS Interrupted suture (4 stitches)</td>
</tr>
<tr>
<td>Stent (3~5cm sized)</td>
<td>Internal stent</td>
<td>Internal stent</td>
</tr>
</tbody>
</table>
Choledochojejunostomy / Hepaticojejunostomy
  – Retrocolic
  – Posterior wall of anastomosis
    • Continuous 4-0 PDS suture
  – Anterior wall of anastomosis
    • Interrupted 4-0 PDS suture

Gastrojejunostomy / Duodenojejunostomy
  – Antecolic
  – Using endo-stapler
  – Without Braun anastomosis
General preparations

• Videoscope
  – 30° Rigid scope >> Flexible scope
    • Less limitation on approach angle and direction
    • Better resolution to distinguish different suture material
    • Solid, constant operative field for intracorporeal suture

• Supine with a reverse Trendelenberg position

• 5 trocars (12mm x 2, 5mm x 3)
### Results

<table>
<thead>
<tr>
<th>Totally laparoscopic SSPPD/PPPD (2007-2012)</th>
<th>Patients (n = 14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>41.5±13.9 (17-65)</td>
</tr>
<tr>
<td>Gender (M:F)</td>
<td>2:12</td>
</tr>
<tr>
<td>Operative time</td>
<td>570.5±144.4 (376-780)</td>
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<tr>
<td>Transfusion</td>
<td>1</td>
</tr>
<tr>
<td>Hospital stay</td>
<td>14.6±7.2 (7-51)</td>
</tr>
<tr>
<td>Pathology</td>
<td></td>
</tr>
<tr>
<td>Serous cystic neoplasm</td>
<td>3</td>
</tr>
<tr>
<td>Solid-pseudopapillary neoplasm</td>
<td>5</td>
</tr>
<tr>
<td>GIST</td>
<td>1</td>
</tr>
<tr>
<td>Neuroendocrine tumor</td>
<td>3</td>
</tr>
<tr>
<td>AOV cancer</td>
<td>2 (pT1N0)</td>
</tr>
</tbody>
</table>
## Results

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<tr>
<th>Totally laparoscopic SSPPD/PPPD (2007-2012)</th>
<th>Patients (n = 14)</th>
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</thead>
<tbody>
<tr>
<td>Conversion</td>
<td>0</td>
</tr>
<tr>
<td>Morbidity</td>
<td>5 (35.7%)</td>
</tr>
<tr>
<td>Fluid collection (POPF Gr B)</td>
<td>2</td>
</tr>
<tr>
<td>DGE</td>
<td>2</td>
</tr>
<tr>
<td>Mechanical ileus (adhesive band)</td>
<td>1</td>
</tr>
<tr>
<td>Wound problem</td>
<td>1</td>
</tr>
<tr>
<td>Mortality</td>
<td>0</td>
</tr>
<tr>
<td>Margin negative resection (%)</td>
<td>100</td>
</tr>
</tbody>
</table>
Results

Postop. 9th months
Summary

• Easily reproducible procedure &
  Well reflection on the difference of approach
  – Simplify resectional procedure from anterior to posterior direction

• Reduce time-consuming procedure
  – More exercise and training for intracorporeal suture
  – Adopted new concept such as SSPPD

• Still demanding “No significant difference from conventional PD/PPPD”
Thank you for your attention