Pancreatectomy –
the anatomy and the surgical approaches

Paul BS LAI
Division of Hepato-biliary and Pancreatic Surgery
Department of Surgery
The Chinese University of Hong Kong
Whipple’s operation - complexity

Freehand drawing by Whipple of re-established gastrointestinal continuity following pancreaticoduodenectomy in patients operated on by him after 1942. (From Whipple AO. A reminiscence: pancreaticoduodenectomy. Rev Surg 1963;20:221–5, Fig.2, p.224. © Elsevier Inc)
Pancreaticoduodenectomy – the procedure

1. Assessment of the abdomen for metastatic disease
2. Mobilization of the duodenum and the head of pancreas with identification of SMV
3. Mobilization of the stomach and transection of proximal duodenum
4. Skeletonization of the structures at the porta hepatis
5. Cholecystectomy and division of common hepatic duct
6. Mobilization and division of proximal jejunum
7. Transection of the neck of pancreas and division of the remaining attachment of the specimen to the superior mesenteric vein, portal vein and superior mesenteric artery
8. Reconstruction of GI continuity (PJ, HJ and DJ)
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The attachments of the uncinate process of the pancreatic head to the posterior areolar tissue attachments of the retroperitoneum and to the vascular branches of superior mesenteric vein and artery and portal vein are divided parallel to the superior mesenteric vein and artery and portal vein with the stapler, as depicted for a pancreaticoduodenectomy.
Dissection of pancreatic tissue off the SMA
Using TA to transect parallel to SMA
But is there something wrong with what we are doing?
anatomy of pancreas

behind the uncinate process with an anterior inferior pancreatice-duodenal branch of the superior mesenteric artery (Fig. 440).

2. Neck and Body of the Pancreas.—The blood-supply of the neck and body of the pancreas

Fig. 440.—Arterial supply of pancreas, showing most frequently occurring distribution of vessels in 28 dissections.

The posterior superior pancreatice-duodenal artery was observed in 25 dissections. In all but is normally derived from inferior and superior pancreatic arteries. The inferior pancreatic artery
Figure 5-26  Pancreas and anterior relations of the kidneys.
Dual arterial supply of pancreas

Aberrant right hepatic artery from SMA

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Yes! There is something wrong here......

In many places in the world, the 5-year survival after curative pancreaticoduodenectomy is less than 20 percent......
IPDA is mostly around 1st jejunal vein branch (JBr).
Review

‘Artery-first’ approaches to pancreatoduodenectomy

P. Sanjay\textsuperscript{1,6}, K. Takaori\textsuperscript{3}, S. Govil\textsuperscript{4}, S. V. Shrikhande\textsuperscript{5} and J. A. Windsor\textsuperscript{1,2}

\textsuperscript{1}Hepatopancreatobiliary/Upper Gastrointestinal Unit, Department of General Surgery, Auckland City Hospital, and \textsuperscript{2}Department of Surgery, School of Medicine, Faculty of Medical and Health Sciences, University of Auckland, Auckland, New Zealand, \textsuperscript{3}Division of Hepato-Biliary-Pancreatic Surgery and Transplantation, Department of Surgery, Kyoto University Graduate School of Medicine, Kyoto, Japan, \textsuperscript{4}Division of Gastrointestinal Oncology, Bangalore Institute of Oncology, Bangalore, and \textsuperscript{5}Department of Gastrointestinal and Hepatopancreatobiliary Surgical Oncology, Tata Memorial Centre, Mumbai, India, and \textsuperscript{6}Department of Surgery, Ninewells Hospital and Medical School, Dundee, UK

\textit{Correspondence to}: Professor J. A. Windsor, 12th floor, Support Building, Auckland City Hospital, Park Road, Grafton, Auckland, New Zealand (e-mail: j.windsor@auckland.ac.nz)
Fig. 1 Diagram showing the six approaches to the superior mesenteric artery: S, superior approach; A, anterior approach; P, posterior approach; L, left posterior approach; R, right/medial uncinate approach; M, mesenteric approach
Essence - dissect off everything right to SMA
Advantages of artery-first approach to PD

To determine unresectability early

— resectability depends on arterial rather than venous involvement
— the posterior or posteromedial part of pancreatic head and uncinate is dissected off the SMV and SMA without dividing the pancreatic neck (avoiding the point of no return)

Awareness that accurate dissection of the posteromedial margin of the pancreas yielded the best chance of a negative resection margin

— and such required the tissue on the right side of SMA to be resected
Figure 3. Case presentation: a fresh surgical specimen (left side) and formalin-fixed connective tissue surrounding the mesenteric pedicle (right side). A focus of plexus invasion (open circle) is located in the vicinity of the first jejunal artery. Metastases to tiny lymph nodes (closed circles) were observed. Loose connective tissue in this figure corresponds to the illustrated tissue in Figure 2c (arrow).

Important prognostic factors in patients undergoing PD

- Tumour biology
- Patient’s fitness and co-morbidities
- Achievement of R0 resection (this should be controllable by surgeons!)
Essence - dissect off everything right to SMA
Blumgart’s PJ
Blumgart’s PJ
External Pancreatic Stent
### external pancreatic stent vs. no stent

#### 4RCT

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<td>PF rate</td>
<td>7% : 20% *</td>
<td>26% : 42% *</td>
<td>35% : 41%</td>
<td>15% : 30% *</td>
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<td>Morbidity</td>
<td>32% : 38%</td>
<td>42% vs 62% *</td>
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<td>Hospital stay</td>
<td>17 vs 23 days*</td>
<td>22 vs 26 days</td>
<td>NA</td>
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Meta-analysis of the 4 RCTs

- 416 patients
- PF rate, overall morbidity and length of hospital stay significantly ↓ with external pancreatic stent
- No difference in hospital mortality, delayed gastric emptying, operation time, operative blood loss, blood replacement and reoperation rate

*Hong S et al. J Gastrointest Surg 2013 Apr 9*
Do not pray for an easy life, pray for the strength to endure a difficult one.