

LAPAROSCOPIC PANCREATIC RESECTION



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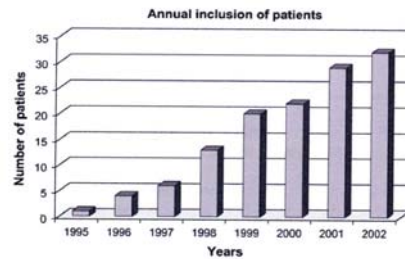
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Strasbourg, IRCAD October 2010

LAPAROSCOPIC PANCREATIC RESECTION

HISTORY

- * 1987 : MOURET : the first lap. cholecystectomy
- * 1992 : GAGNER : the first lap. partial pancreatectomy
- * 1994 : GAGNER : the first lap. WHIPPLE operation
- * in 2010 : > 800 cases reported



Mabrut Surgery 2005; 137: 597-605

LAPAROSCOPIC PANCREATIC RESECTION

PHILOSOPHY ?

- Not to change the **indications**
- Not to change the philosophy of **radicality**
- **Do the same operation**, even if the approach is laparoscopic

END-POINTS ?

- Not the technique
- Not the surgical ego of the surgeon (laparoscopic feasibility)
- **Complications +++**
- POHS is not an issue !
- **Late disease-free survival is the only important issue !!!**

LAPAROSCOPIC PANCREATIC RESECTION

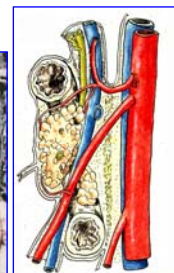
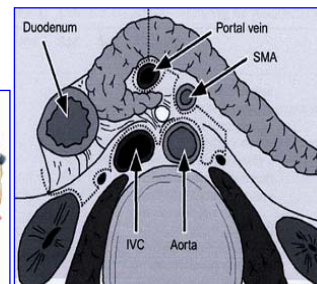
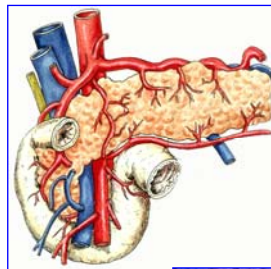
LAPAROSCOPIC LIMITATIONS

Anatomical

- retroperitoneal position
- close relationship with major vessels
- fragile consistency of the pancreas

Philosophical

- the philosophy and end-points of MI surgery are quite different than the one required for radical oncological surgery !!!



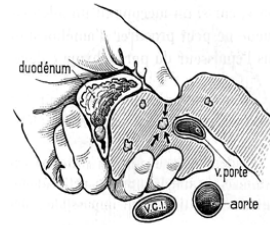
From JR Delpero

LAPAROSCOPIC PANCREATIC RESECTION

LAPAROSCOPIC LIMITATIONS

Technical

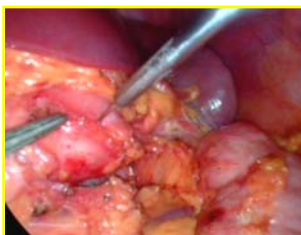
- Loss of tactile sensation
- difficulty to explore the whole pancreas → IOUS!
- technically demanding and time consuming operation
- requires expertise in pancreatic surgery and lap. advanced procedures
- risk of non radical surgery ?
- risk of tumor cell dissemination in malignant diseases?



LAPAROSCOPIC PANCREATIC RESECTION

THE ROLE OF LAPAROSCOPIC ULTRASOUND

- * determine the **accurate site and number of tumor(s)**
- * determine the **tumor relationship** with the **main pancreatic duct (enucleation)** and **the splenic vessels**
- * determine the optimal **transection site** and **adequate resection margin**
- * to screen **liver parenchyma** for secondaries



LAPAROSCOPIC PANCREATIC RESECTION

LITERATURE REVIEW

- Literature review from 1992 to 2010
- English and French articles
- Only series with > 20 patients
- Comparison with the **European Multicenter series ***
- Topics to be addressed : selection process, indications, types of procedure,
results: mortality, morbidity, long-term survival ?

Park Ann Surg 2002;236:149
Masson Ann Chir 2003;128:452
Gagner Ann Chir 2004;129:2
Edwin Surg Endosc 2004;18:407

Ayav Arch Surg 2005;390:134
Dulucq Surg Endosc 2005;19:1028
Pierce Surg Endosc 2007;21:579
Palanivelu Surg Endosc 2007;21:373

Melotti Ann Surg 2007;246:77
Fernandez-Cruz J GI Surg 2007
Kooby Ann. Surg 2008;248:438-446
Rosok,BJS 2010;97:902-9

***Mabrut Surgery 2005;137:597**

LAPAROSCOPIC PANCREATIC RESECTION

STUDY DESIGN

Literature

- All retrospective studies
- All Expert monocenter series
..... except 2 multicenter series
- Median number of patients: 37
(range: 22 – 159)
- 667 patients

European study *

- Retrospective study
- 25 European centers
- * Only 4 centers (16 %) with > 10 patients
- * 127 patients

* Mabrut et al. Surgery 2005; 137: 597-605

LAPAROSCOPIC PANCREATIC RESECTION

INDICATIONS

Literature

• Benign diseases	393 - 59 %
- insulinoma:	98
- cystic tumors (SCA:68, MCA:120):	188
- cystic lesions (cysts:14, IPMPT:32):	48
- chro pancreatitis:	42
- others:	17
• Low-grade malignancy	178 - 27 %
- neuroendocrine tumor (NET):	164
- Pseudopapillary tumor:	8
- Malignant IPMPT:	6
• Malignancy	96 - 14 %
- Cystadenocarcinoma:	12
- Ductal adenocarcinoma:	68
- Metastases:	16

European study *

• Benign diseases	91 - 72 %
- insulinoma:	22
- cystic tumors (SCA:21, MCA:26):	47
- cystic lesions (cysts:4, IPMPT:8):	8
- chro pancreatitis:	11
- others:	3
• Low-grade malignancy	28 - 22 %
- neuroendocrine tumor (NET):	28
• Malignancy	8 - 6 %
- Cystadenocarcinoma:	2
- Ductal adenocarcinoma:	4
- Metastases:	2

86%

94%

* Mabrut et al. Surgery 2005; 137: 597-605

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TUMOR LOCATION

Literature

Total: 475

• Head:	43
• Neck:	10
• Body-tail:	421
• Diffuse:	1

89%

European study *

Total: 131

• Head:	7
• Neck:	8
• Body-tail:	116
• Diffuse:	0

89%

* Mabrut et al. Surgery 2005; 137: 597-605

LAPAROSCOPIC PANCREATIC RESECTION

TYPE of PROCEDURES

	Literature	European study
• Enucleation:	88	21 (95 % lap. feasibility)
• Distal splenopancreatectomy:	319	24 (89 % lap. feasibility)
• DP + Spleen preservation:	243	58 (81 % lap. feasibility)
• Medial pancreatectomy:	1	0
• Cyst excision:	0	1
• Pancreatoduodenal resection:	14	3
• Total pancreatectomy:	2	0
	Total: 667	Total: 107

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SPLEEN PRESERVATION

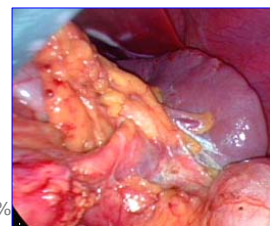
European study

- * attempted in 58 patients
- * by preservation of
 - splenic vessels in 79 %
 - short gastric vessels (Warshaw) in 21 %

Final success rate of 81 %

Fernandez-Cruz

- * attempted in 52 patients
- * by preservation of ...
 - splenic vessels in 35 %
 - short gastric vessels in 65 %
- * Higher complications rate compared to DSP
(25.2 % versus 16.7 %; p<0.05)
- * Occurrence of spleen-related complications in 15 %
 - always with the Warshaw technique



Mabrut Surgery 2005; 137: 597-605

Fernandez-Cruz J GI Surg 2007

LAPAROSCOPIC PANCREATIC RESECTION

PANCREATIC-RELATED COMPLICATIONS

Literature

European study

• Prevalence: **17 % (4-30%)**

31 %

- including 17 % of PF
- NS between lap (33%) et converted (18%)

Risk Factors: **Enucleation !!!**

- more frequent
- more severe

Multivariate Analysis:

- chronic pancreatitis p<0.04
- conversion to open p<0.03
- lap closure pancr stump p<0.02
- lap selective suture PD p<0.05

LAPAROSCOPIC PANCREATIC RESECTION

Literature

European study

CONVERSION RATE

9 % (range: 7 – 18 %)

14 %: - 5 % for oncological reasons

- 9 % for technical reasons

POHS

for successful laparoscopic procedures

7.4 days
(range: 4 – 11)

7 days
(range: 3 – 67)

LAPAROSCOPIC PANCREATIC RESECTION

Literature

European study

MORTALITY

0.8 %
(from 0 – 8.3 %)

0 %

POSTOP. COMPLICATIONS

29.5 %
(range: 9 % – 53 %)

39 %
-laparoscopy: 41 %
-conversion: 24 % : NS

LAPAROSCOPIC PANCREATIC RESECTIONfor MALIGNANCIES

ONCOLOGICALLY SOUND ?

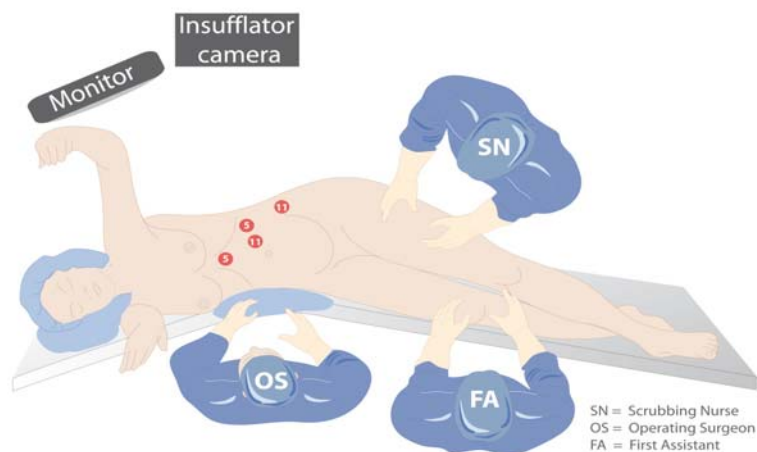
.... very few data !

Authors	Patients	R1 margin	Mean FU	Recurrence	Trocar recurrence
Mabrut	16 (6 PaCa)	0 %	16 (3-47)	23 %	0
Edwin	5 PaCa	40 %	12 (11-13)	2/3 lap	NA
Fernandez-Cruz	13 PaCa	10 %	14	23 %	NA
Melotti	5 PaCa	0	26 (18-43)	0	NA

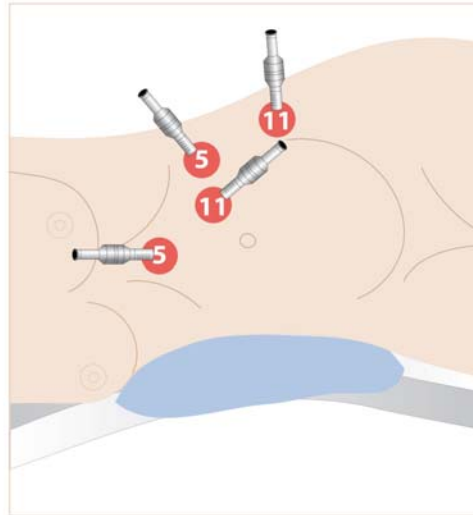
Laparoscopic resection of malignancies remains controversial

TECHNICAL ASPECT OF DISTAL PANCREATECTOMY

PATIENT POSITION AND OPERATING ROOM SET UP



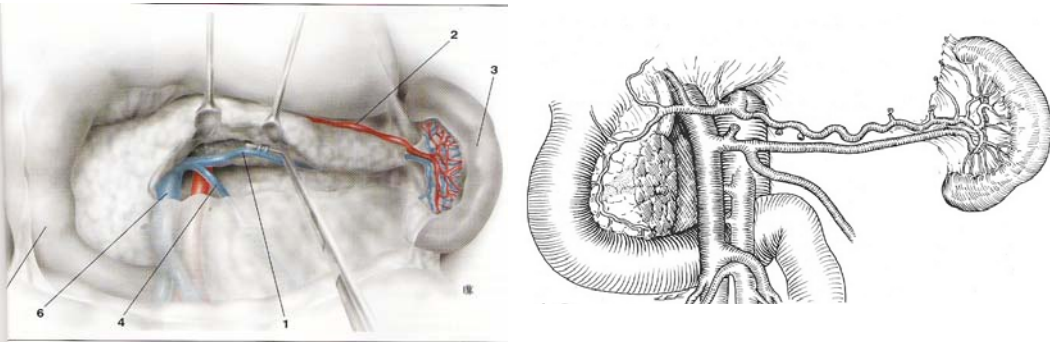
PORTS PLACEMENT



MOVIE:
DISTAL SPLENO PANCREATECTOMY

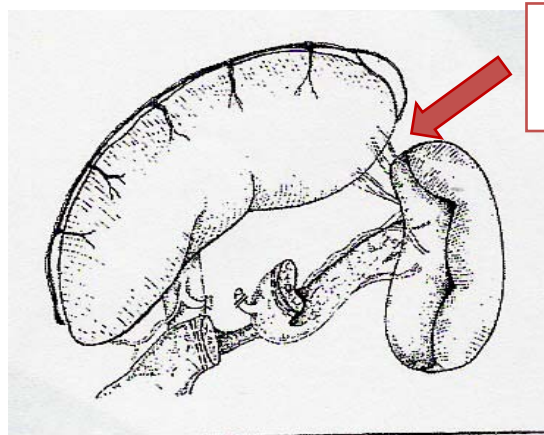
SPLEEN PRESERVATION

1. Preservation of the splenic vessels



SPLEEN PRESERVATION

2. The WARSHAW technique



Preservation
of the short
gastric
vessels

MOVIE:
WARSHAW TECHNIQUE

LAPAROSCOPIC PANCREATIC RESECTION

CONCLUSIONS

- A significant *worldwide experience* with LPR is now available (not only issued from expert centers).
- Obvious *selection process of patients and procedures* is observed :
 - mostly presumed benign pancreatic diseases
(insulinoma, localized NET, cystic tumours, IPMPT, ...)
 - inclusion of malignancies is limited
 - distal or superficial tumour location in 90 %
 - mostly enucleation and left-sided resection

LAPAROSCOPIC PANCREATIC RESECTION

CONCLUSIONS

- The *oncological benefit* of LPR for *high-grade malignancies* is unproved (radicality, lymph nodes clearance, survival, ...)
- The *pancreatic-related complications* rate remains the corner-stone of the procedure and the successful management of the *pancreatic stump* remains a challenge