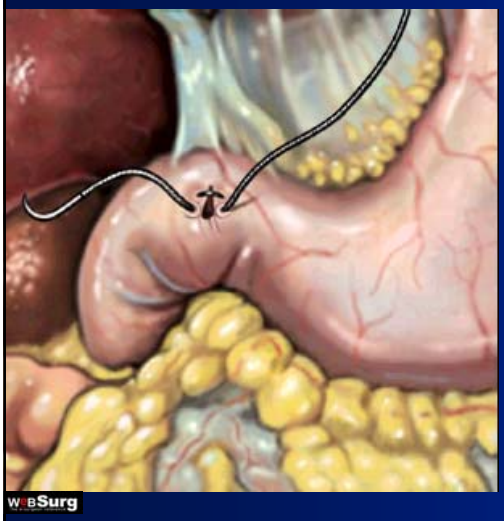


Laparoscopy for Perforated Peptic Ulcer (PPU)

B. Navez

Service de Chirurgie et Transplantation Abdominale
St Luc University Hospital, Brussels

Perforated Gastro-Duodenal Ulcer

EAES recommendations

(Surg Endosc 2006, 20, 14-29)

« If symptoms and diagnostic findings are suggestive of perforated peptic ulcer, diagnostic laparoscopy and laparoscopic repair are recommended (GoR A) »

Introduction

- PPU occurs in about 5-10% of duodenal ulcers with an overall mortality of 3-14%
- Recently, due to Proton Pump Inhibitors (PPI) and H. pylori eradication therapy, the incidence of PPU has decreased.

Ulcer closure
Anti-ulcer therapy
HP eradication
→ standard therapy of PPU

Ulcer relapse 1 year after PPU

	Routine HP eradication	Control Group
E.K.W. Ng , Ann Surg 2000, 231: 153-158	4.8 %	38.1 %
A.El-Nakeek, Int J Surg 2009, 7(2): 126-129	6.1 %	29.6 %

Routine HP eradication should be recommended

3 Randomized Controlled Trials (n=325)

Author	* LG (N)	* OG (N)
W.Y.Lau (Ann Surg 1996)	52	51
W.T. Siu (Ann Surg 2002)	58	63
M. Bertleff (World J Surg 2009)	52	49

* LG: laparoscopic group OG: open group

Bertleff M,Surg Endosc 2010

Average results of the 3 RCT (n=325)

	LG	OG
Op. time (min)	70,3	52,1
VAS (day 1)	3,8	5,5
Hospital stay	6	6,5
Normal diet (days)	4	4
Normal daily activities (days)	10,4	26,1
Wound infections (%)	0	6,1
Leakage (%)	3	1,1
Morbidity (%)	22	36
Mortality (%)	2,5	5,8

Bertleff Surg Endosc 2010

Perforated gastric ulcer

- Gastric localization of PPU: 4-13%
- Prepyloric perforated ulcer = perforated duodenal ulcer (same pathophysiology)
- Gastric ulcer located along the lesser curvature of the stomach: ulcer excision + biopsy (malignant ulcer?) + defect suture

Martin RF, Surg Clin N Am,2005

Factors associated with UNSUCESSFUL Laparoscopic Repair

1. **BOEY risk factors**
   - Shock on admission : systolic BP < 90 mm Hg
   - Severe medical illness as ASA III-IV
   - Duration of symptoms > 24 hours

- Boey score has four distinct degrees: 0,1,2,3
- Boey score will influence conversion, morbidity and mortality rates

2. **Expertise in Laparoscopic Surgery**

Lunevicius, World J Surg 2005, 29: 1299-1310
Lee, Arch Surg 2001, 136: 90-94

Boey's scoring system for predicting postoperative mortality

Author	Year	Mortality (average)	Mortality and Boey risk factors			
			0	1	2	3
Boey J	1987	6,2%	0%	10%	45,5%	100%
Lee FYJ	2001	7,8%	1,5%	14,4%	32,1%	100%
Arici C	2007	13,6%	0%	12%	32%	63%
Lohsiriwat V	2008	9%	1%	8%	33%	38%

Mortality (17 studies, n=1802) : 5,8%

Bertleff Surg Endosc,2010

Reasons for conversion

- **Inadequate ulcer localization** — 31-100 %
- **Large ulcer size** — 20-60 %
- **Posterior pyloro-duodenal ulcer** — 12.5-33 %
- **Infiltration and fragility of ulcer edges** — 4-11 %

  Associated bleeding

  Cardiovascular instability

- **BOEY score** →

	Conversion rate
0	21 %
1	30 %
2	82 %

Lunevicius, World J Surg 2005, 29: 1299-1310
Lee, Arch Surg 2001, 136: 90-94

Indications for laparotomy

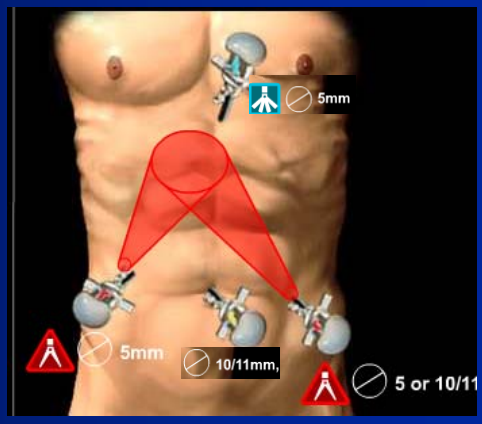
Septic shock ⇒ absolute contraindication for laparoscopy

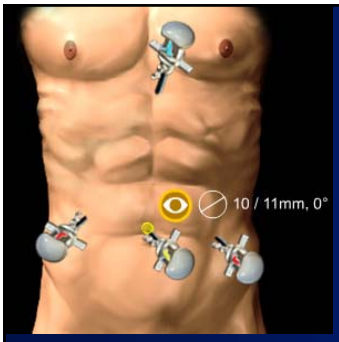
- Hemodynamic instability
- Patient with multiple abdominal operations
- Simultaneous bleeding/stenosis
- Major cardiac and/or pulmonary comorbidities (contraindications for pneumoperitoneum)
- Surgeon's inexperience and inadequate equipment for laparoscopic repair

Lunevicius R ,World J Surg2005

Surgical technique

- Installation of patient / Positionning of trocars





PERFORATED

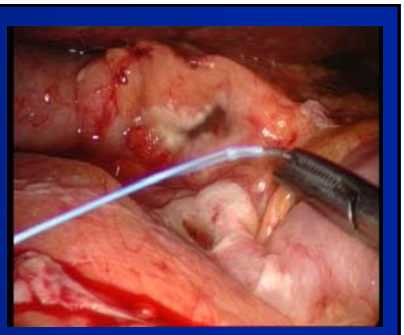
DUODENAL ULCER

WEBSurg

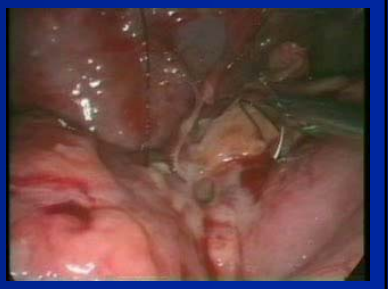
Surgical technique (29 studies)		
Surgeon's position	**44% between legs**	33% left S, 6 % right S 16 % between of left S
Camera	**80% 30°**	10% 0° , 10 % 40°
Suture material	**64% absorbable**	36% non-absorbable
Knotting technique	**64% intracorporeal**	16% extracorporeal 14 % mix
Closure of perforation	**66% omental patch**	24% mixed technique 10% sutures only
Irrigation fluid	**45 % generous**	55 % : 2 – 6 L
Abdominal drain	**79 % Yes**	21 % No
Nasogastric Tube	**94 % Yes**	6 % No

Bertleff ,Surg Endosc2010

- Suture of the perforation



- Suture + Omental patch



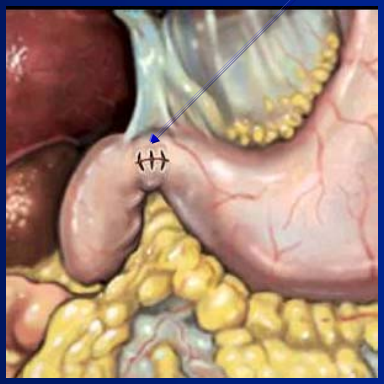
- Graham-Steele patch

  (only omental patch)

Surgical technique

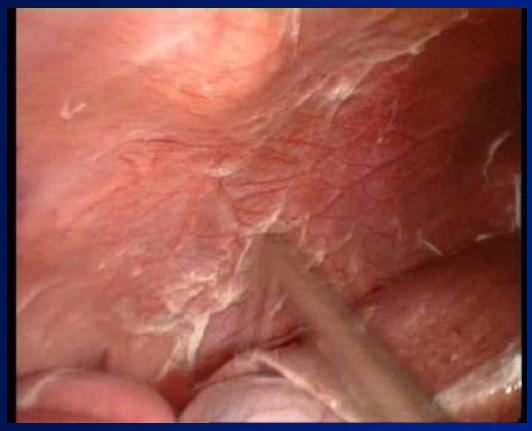
- To be avoided !!

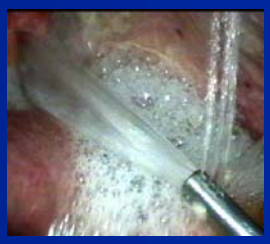
  Longitudinal suture → duodenal stenosis

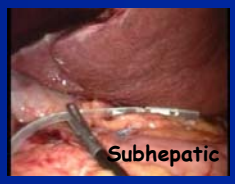


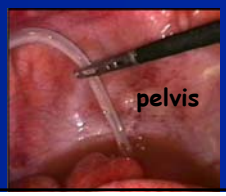
Surgical technique

- Lavage and drainage









Summary of Perforated Ulcer

- Laparoscopic repair of PPU is feasible and safe
- Supported by 3 RCT
- Eradication of HP is recommended to decrease Ulcer relapse (2 RCT)
- BOEY risk factors must be considered (place for open repair)
- Sufficient laparoscopic expertise
- Conversion when inadequate ulcer localization or large perforation
- Suture leak, intraabdominal abscess, ileus and pumonary complications : most commonly reported morbidity