Laparoscopic approach in 2011 ...

Jean Closset

Philippe Hauters

ULB

Scalpel menacé par la rouille …

au vestiaire ?

- Appendicite aiguë … Abie
- Occlusion colique … Laser
- Lithiase vésiculaire ≠ maladie

- Chirurgie biliaire « Solvants » Laparoscopie
  Lithotritie
  Ultra-sons

→ Problème de paroi ?

From Tomy to Scopy…

From Tomy to Scopy ...

- Less postop pain
- Less impairment of pulmonary function

Table 1 Values of maximal inspiratory pressure (MIP) and maximal expiratory pressure (MEP) variables, in absolute and as a percentage of predicted values in the preoperative and postoperative period for the laparoscopy (LG) and open-surgery (OG) groups

	Laparoscopy group (n=13)			Open group (n=13)		
Variables	PRE	POS	% PRE–POS difference	PRE	POS	% PRE–POS difference
MIP (cm H_2O)	83.5±12.5	64.6±16.6*	−23%	92.3±25.2	58.5±23.8*	−37%
% MIP	91.7±12.7	71.2±19.2*	−23%	100.9±27.7	63.9±26.2*	−37%
MEP (cm H_2O)	105.4±25.4	76.9±25.9*	−27%	104.6±27.3	41.2±11.9*, **	−61%
% MEP	116.1±30.2	85.1±32.1*	−27%	113.8±30.1	44.7±12.7*, **	−61%

PRE preoperative period, *POS* postoperative period

*p<0.01— PRE vs POS; **p<0.05— LG vs OG

Barbalho, Obes Surg, 2011

From Tomy to Scopy ...

Table 2 Values of vital capacity (VC), volume tidal (VT), inspiratory reserve volume (IRV), expiratory reserve volume (ERV), forced vital capacity (FVC), forced expiratory volume in one second (FEV_1), and maximum voluntary ventilation (MVV) variables in absolute and as percentage of predicted values in the preoperative and postoperative periods for the laparoscopy (LG) and open (OG) groups

	Laparoscopy group (n=13)			Open group (n=13)		
Variables	PRE	POS	% PRE–POS difference	PRE	POS	% PRE–POS difference
VC (L)	3.46±0.72	2.90±0.76*	−16%	3.10±0.67	2.05±0.39*, ***	−34%
% VC	99.1±14.9	82.5±16.3*	−16%	92.4±13.7	61.4±9.7*, ***	−34%
VT (L)	0.80±0.26	0.79±0.35 ns	−1%	0.69±0.24	0.59±0.18 ns	−14%
IRV (L)	2.15±0.50	1.82±0.49*	−15%	2.08±0.65	1.27±0.31*, ***	−39%
ERV (L)	0.51±0.35	0.30±0.21*	−41%	0.33±0.22	0.23±0.16**	−30%
FVC (L)	3.46±0.71	2.92±0.72*	−16%	3.20±0.70	2.21±0.49*, ***	−31%
% FVC	98.8±14.8	83.2±15.4*	−16%	94.8±13.8	66.2±13.9*, ***	−31%
FEV_1 (L)	2.77±0.61	2.36±0.64*	−15%	2.58±0.60	1.85±0.43*, ***	−28%
% FEV_1	93.6±14.6	79.0±15.1*	−15%	90.2±14.9	65.5±14.4*, ***	−28%
MVV (L/min)	109.6±20.6	95.6±22.9**	−13%	109.1±21.5	77.1±20.7*, ***	−29%
% MVV	103.0±16.7	89.8±20.5**	−13%	104.5±16.2	74.4±18.5*, ***	−29%

PRE preoperative period, *POS* postoperative period, *ns* not significant

*p<0.01—PRE vs POS, **p<0.05—PRE vs POS; ***p<0.05—LG vs OG

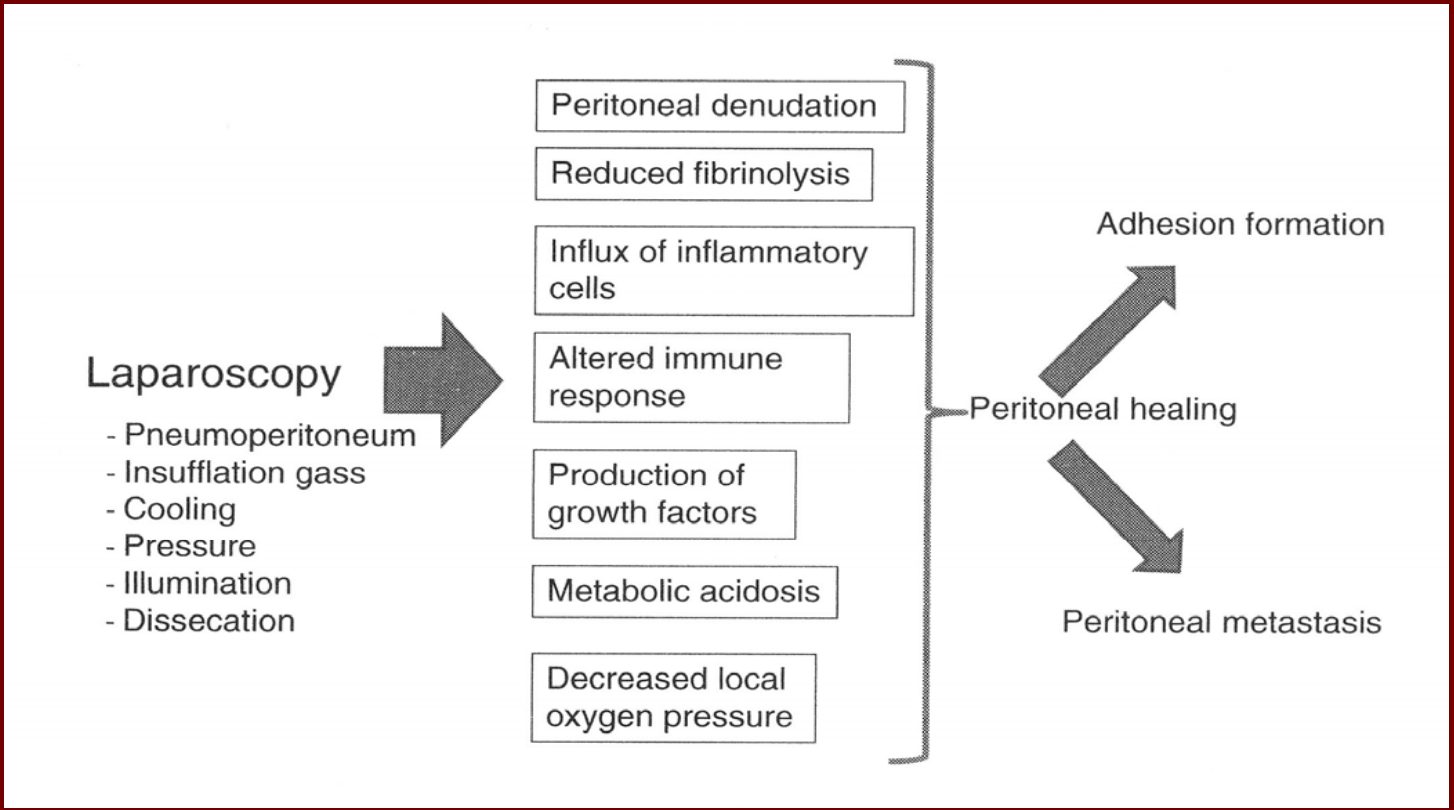
- No differences in Pulm Complications
- No differences in hospital stay

Barbalho, Obes Surg, 2011

From Tomy to Scopy ...

Similar to open surgery, Lap affects: (Acidosis)

- Integrity of pneumoperitoneum
- Biology



Brokelman, Surg End, 2011

From Tomy to Scopy ...

- Anesthésie...
- Techniques chirurgicales, ultracision, ligasure, ...

- Séjours hospitaliers de + en + courts (Financier?)
- Fast-Track

- Drains, Sonde gastrique, Alimentation, ...

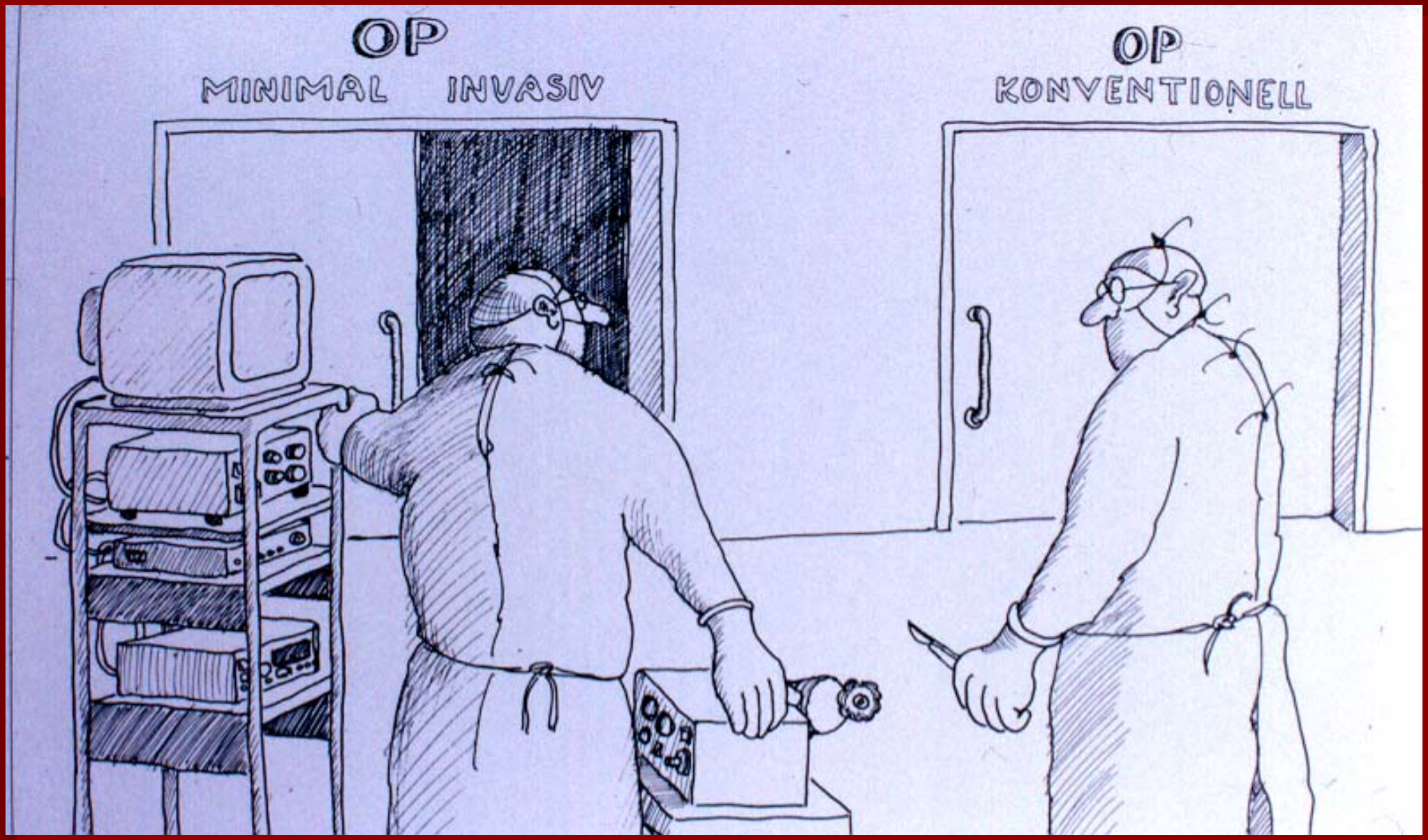
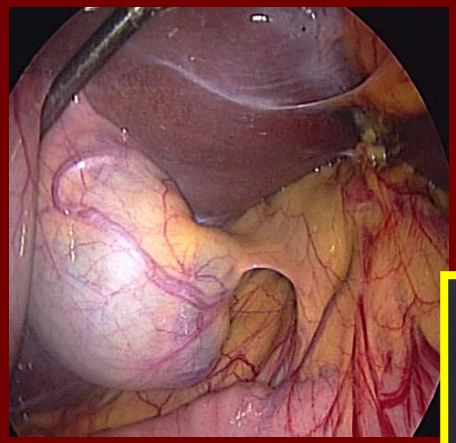

OP
MINIMAL INVASIV
OP
KONVENTIONELL

Table 1. Level of evidence

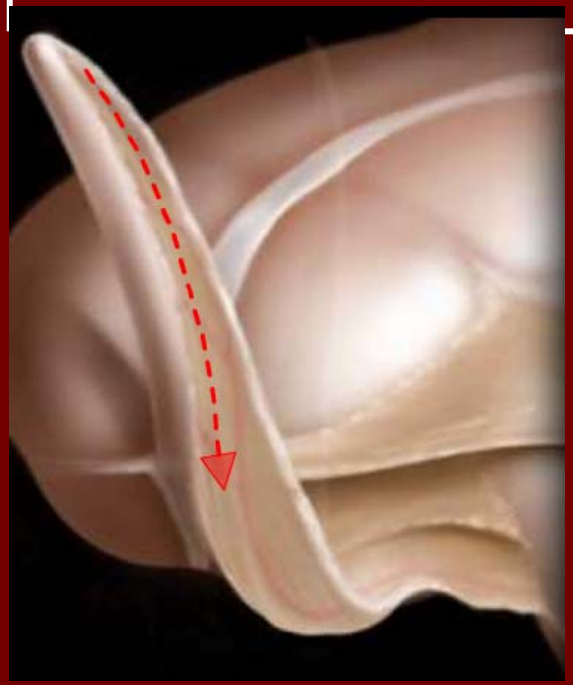
Level of evidence	Criteria
1a	Systematic reviews (metaanalysis) containing at least some trials of level 1b evidence, in which results of separate, independently conducted trials are consistent
1b	Randomized controlled trial of good quality and of adequate sample size (power calculation)
2a	Randomized trials of reasonable quality and/or of inadequate sample size
2b	Nonrandomized trials, comparative research (parallel cohort)
2c	Nonrandomized trial, comparative research (historical cohort, literature controls)
3	Nonrandomized, noncomparative trials, descriptive research
4	Expert opinions, including the opinion of Work Group members

Andrews, BJS, 91
Neugebauer, Springer-verlag, 00
Fink, Am J Pub H, 84
Carter, Surg End, 05

Cholecystectomy *Mouret, 1987*	Rdmz trial minilap/lap EAES consensus meeting 2002	2 b	Barkun lancet 92 NIH report Consensus, 92 Macmahon lancet 94
Acute cholecystitis	Lap ASAP < 3D	I a	EAES consensus 2006 (surg endo 2006) SAGES, Surg End, 2010



Appendectomy	Time<, postop pain <, wound infection <, op time >	I a	Meta-analysis Garbutt Surg laparoscop end 1999 SAGES, Surg End,2010 Ingraham, Surgery, 2010



From Ircad

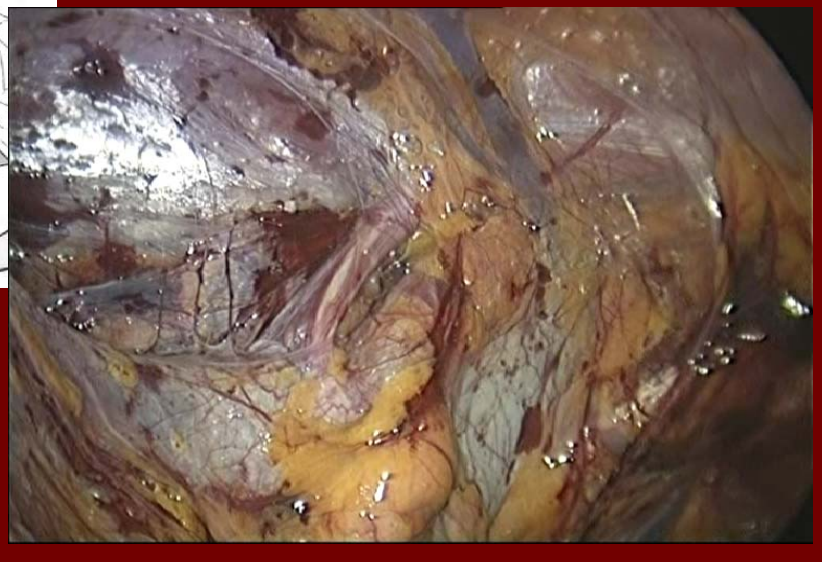
Lap versus open appendectomy in men

- Prospective rdmzd trial – 147 men
- Postop hospital stay =
- More time, more cost Lap group

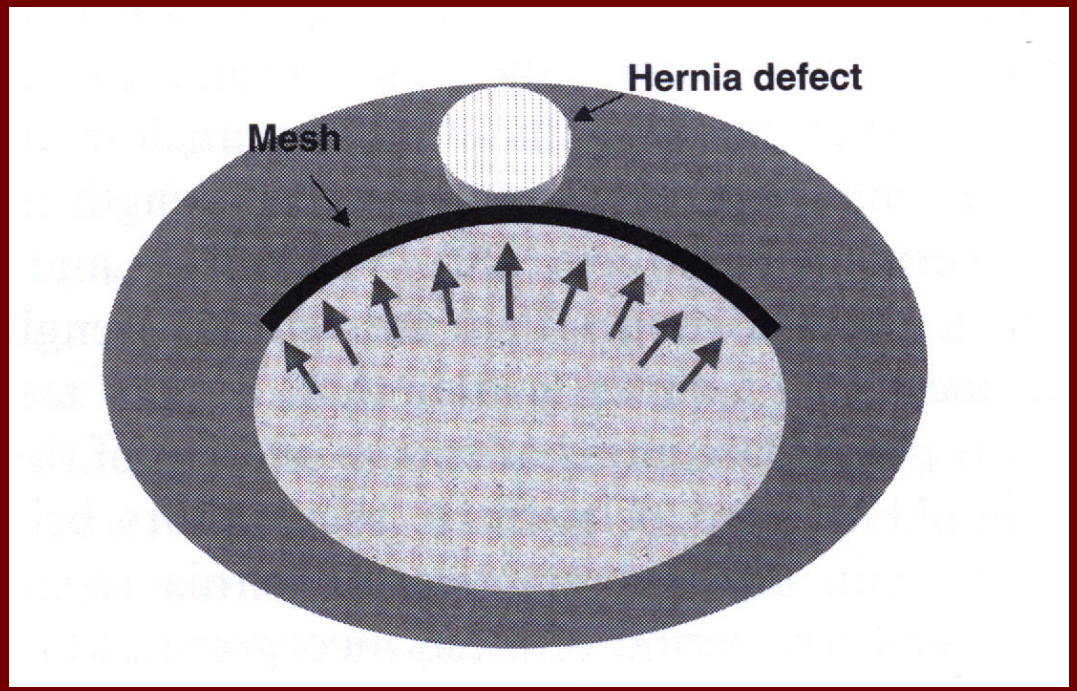
- No advantage lap versus open

Tzovaras, Surg Endosc, 2010

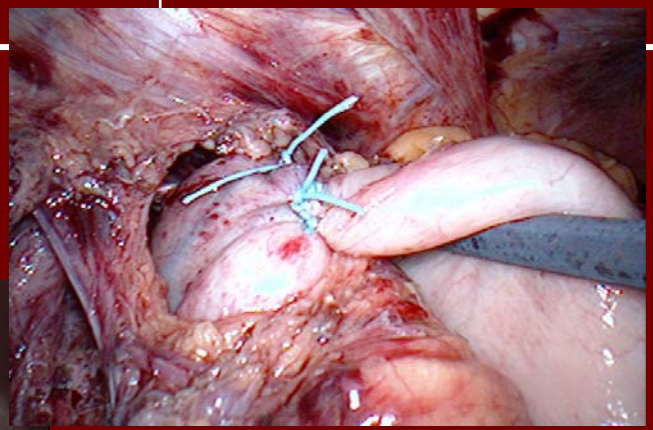
Inguinal Hernia repair	**Mesh** Recurrent, Antero-Post Bilateral TAP-TEP Recurrence = Morbidity, Return to work, Chronic groin pain < Seroma, operative time, cost >	I a	Mccormak Cochrane dsr 2005 Simons, EHS, 2008 Wauschkuhn, Surg End, 2010 (2800 pat)

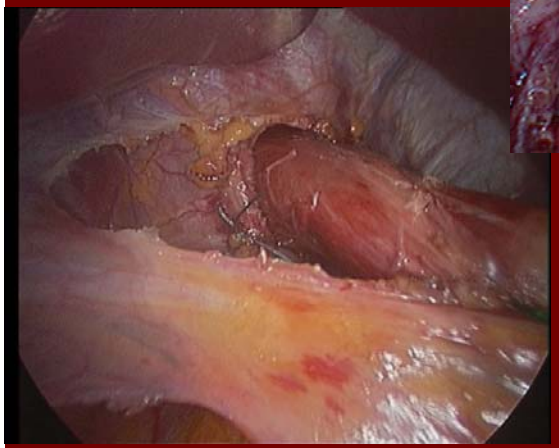


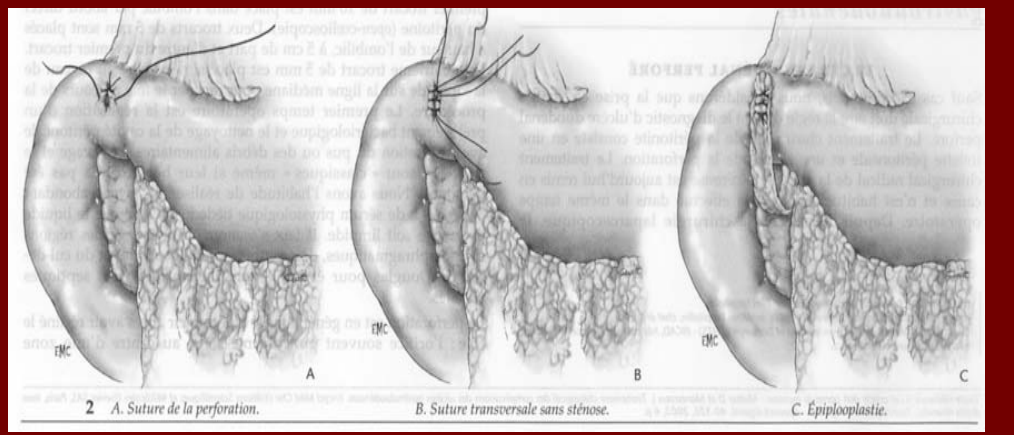
Ventral hernia repair	Lap? Medial, <10cms Rectus muscle medialization? Obese, elderly, ...	2 c	Jin, SCNA, 2008

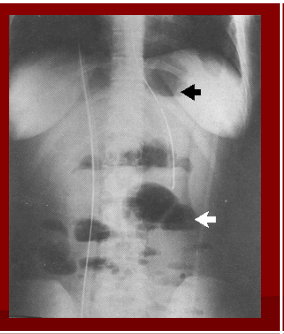
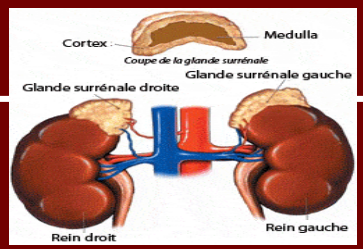


Antireflux Surgery *Dallemagne - 1991*	Same results < pain, > recovery, > op time	I b	Laine surg end 97 Heikkenein, Surg end 00 Nisson, BJS, 00 Broeders, Ann Surg, 2009
Perforated peptic ulcer	Safe and effective + Eradication HP	I b	Malkov, J Am Coll Surg, 2004 Bertleff, Surg End, 2010 Siu, Ann Surg, 2002

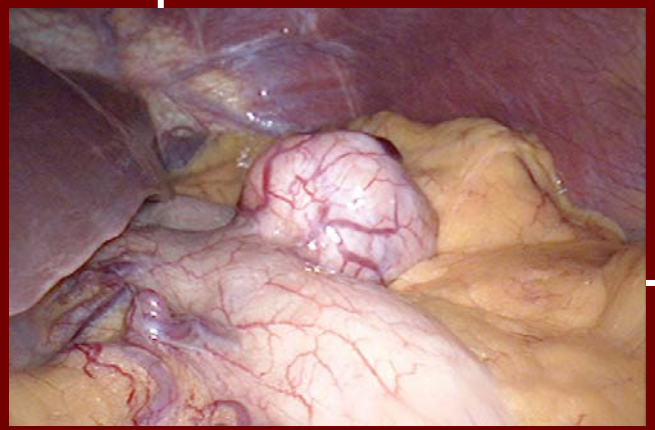




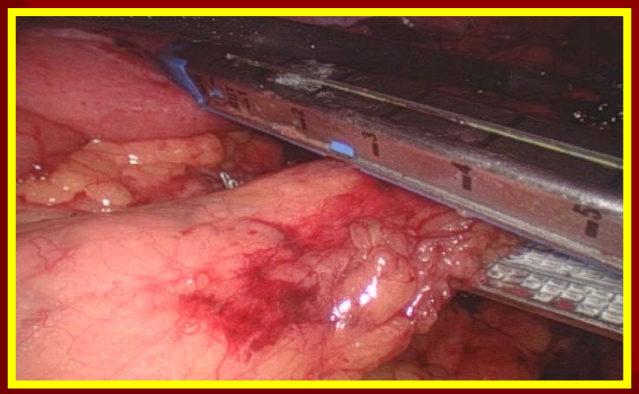


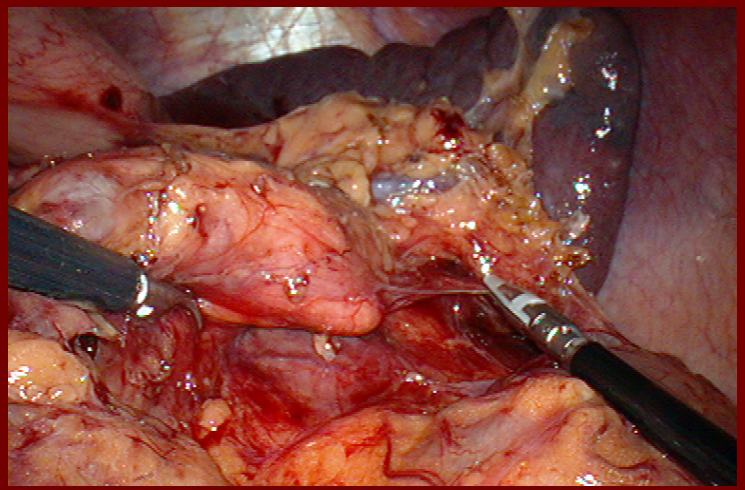
SB Occlusion 	Single band, Mcburney, gyneco	3	Wullstein, BJS, 03
Splenectomy *Delaitre - 91* 	Benign dis, hematologic malignancy Size (<22cm, 1600 g)	3	Walsh, Surg End, 04 Burch, Cancer, 05 Maurus, world j surg, 08
Adrenal *Gagner - 92* 	Incidentaloma, pheo, cushing, aldoster. Size ? Cancer	3	Assalia, BJS, 04 NIH Consens State Statements 02 Ilias, End Rel Cancer, 07

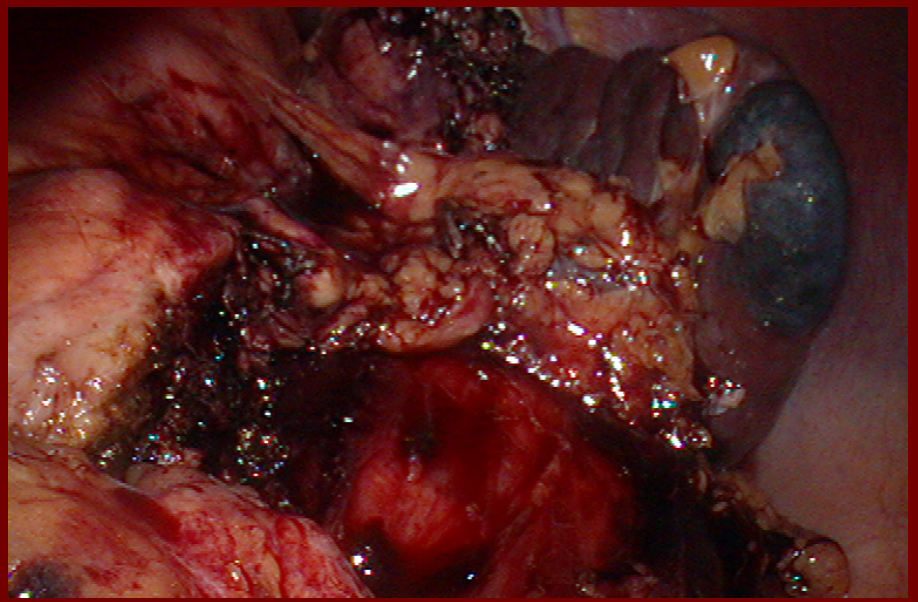
Gastric tumors	Gist, Leiomyoma, Sarcoma, Gastrectomy for C ? = morbidity, = mortality Prognosis ? = ?	3 2 b	Kitano, S C N Am, 2005 Mochiki, Surg End, 2002 Liakakos, Surg End, 2009 Kim, Ann Surg, 2010 (Cancer)
Esophagectomy	Mortality, morbidity, Lymph node resection = Open Prognosis ? = ?	2 b	Gemmill, Br J Surg, 2007 Schoppmann, Surg End, 2010



Pancreas	Staging – Kysto-gastro Enucleation, resection Pancreatic stump!!!	3	Sussman, Anz j surg, 1996 Mabrut, surgery, 2005 Melman, Surg C N Am, 08 Abu Hilal, Surg End, 09





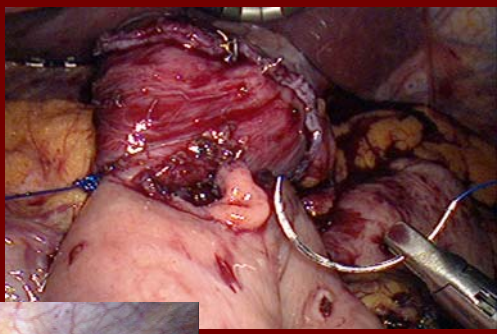


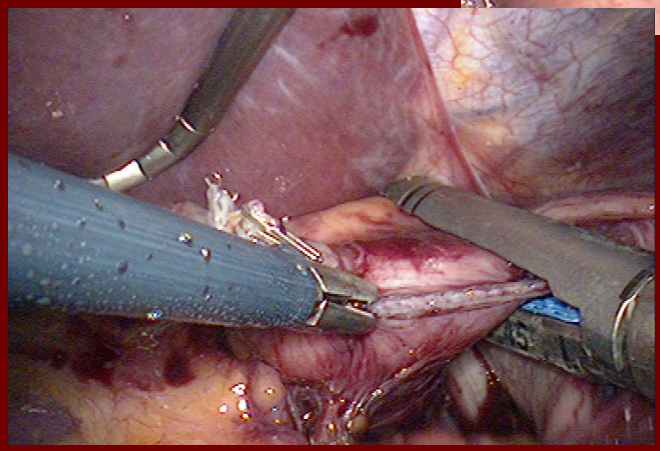
Open or Laparoscopic bariatric surgery

- ***Indications IA***
- ***All procedures feasible via lap – IIA***

- ***More advantageous for Gast Band***

- ***By-pass : EWL similar***
  More frequent anastomotic fistulas ? Internal hernias?
  Hospital stay shorter, Hernia, Work,…
  > 90 % - USA-
  Morbidity higher - redo ???





Nguyen, J Am Coll Surg, 00 – Am Surg, 01
Westling, Obes Surg, 01
Lujam, Ann Surg, 04
Sundbom, Br J Surg, 04
Cottam, Surg End, 05
SAGES, Surg End, 2008
Lim, Obes Surg, 2009

Crohn's disease

Milsom JW et al. Dis Colon Rectum 2001; 44: 1-8
Maartense S et al. Ann Surg 2006; 243: 143-9

II

- Ileocolic resection
- Monocentric randomized

  29/31, 30/30, open / laparoscopic

- Conversion rate 6 or 10%
- Short term:
  - ↗operation time, ↙ hosp stay, ↙ morbidity ↙ pulmonary recovery time

Rectal prolapse

Ashari LH et al. Dis Colon Rectum 2005; 48: 982-7
Kariv Y et al. Surg Endosc 2006; 20: 35-42

- Retrospective single centre study
  Resection rectopexy 117 pts

II

- Retrospective single centre case-control study
  Mesh or suture rectopexy, resection rectopexy 111 pts
- Short-term: Benefits for laparoscopy
- Long-term: No difference in recurrence rate or functional results

Colorectal Cancer

But, … I never once had a patient ask me about the size of the

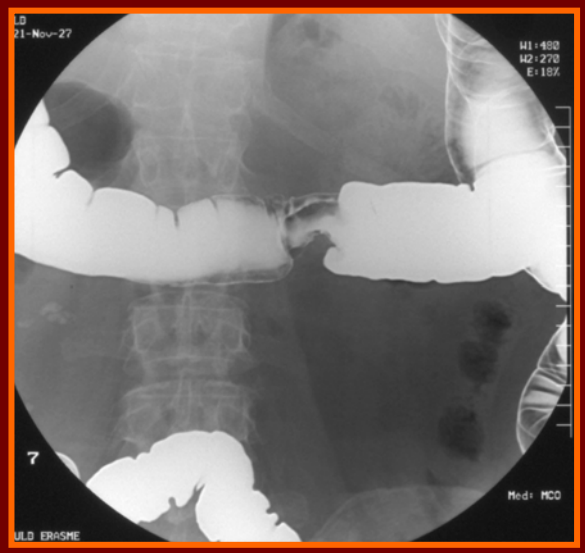
incision, but rather

What are the chances of survival ?

Henri Bismuth, Paris

Colorectal Cancer

Tumour seeding – Port-site metastases



- Early reports frequency 0-4%
- Learning curve, technical mistakes
- Still unable to identify a specific cause
  clearly prevent recurrence
  recognise patients or surgeons at risk

- *Recent randomized studies:*
  Frequency not higher than after laparotomy

Colon cancer

COLOR study group – short term results
Lancet Oncol 2005; 6: 477-84

- Multicentric randomized

  621 open / 627 laparoscopic
- Conversion rate 19%

- Short term:
  - No difference in technical results (nodes, margins)
  - Improved short-term outcome

More recent update (median F-up 7 years) : Equivalent overall survival. (Fleshman – Ann Surg, 2007)

Same conclusions : Koopmann, Surg Clin N Am, 2008

Octogenerians

Vignali A et al. Dis Colon Rectum 2005; 48: 2070-5

- Case-matched 61 open, 61 laparoscopic
- Cancer only, mean age 82.3y
- Conversion 6.1%
- Morbidity:
  - 21.5% laparoscopy / 31.1% open *P*=0.30
- Hospital stay:
  - 9.8% laparosc / 12.9 open *P*=0.001
- Better preservation of postop independence *P*=0.02

Timely conversion

To go as far as possible?? No, especially in cancer.

The priority must remain

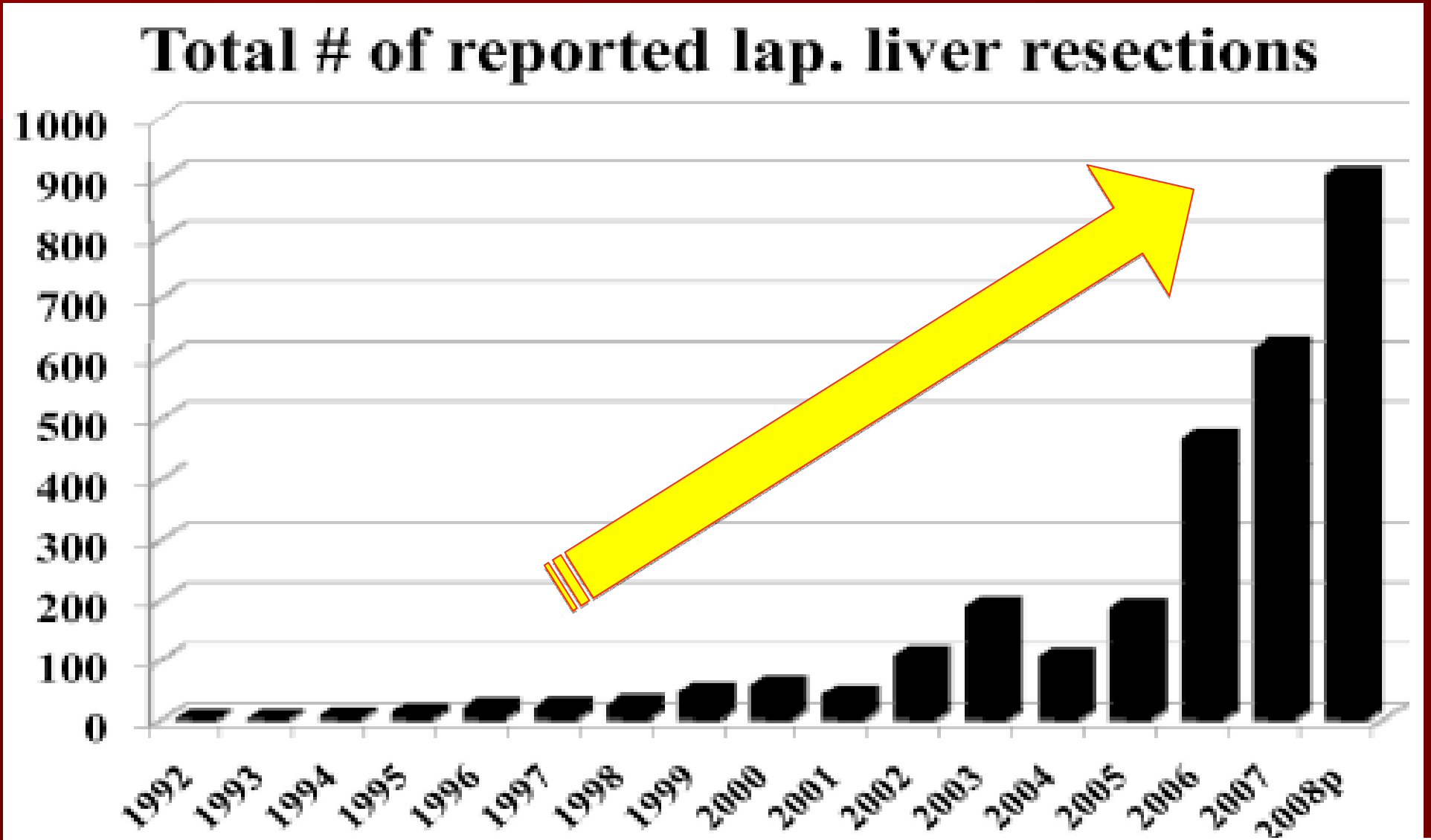
- Quality of the internal procedure
- Respect of the surgical principles and oncologic rules

As soon as a doubt emerges concerning
the implementation of one of these principles,

conversion must be considered.

World Review of Laparoscopic Liver Resection—2,804 Patients

Kevin Tri Nguyen, MD, PhD, T. Clark Gamblin, MD, MS, and David A. Geller, MD



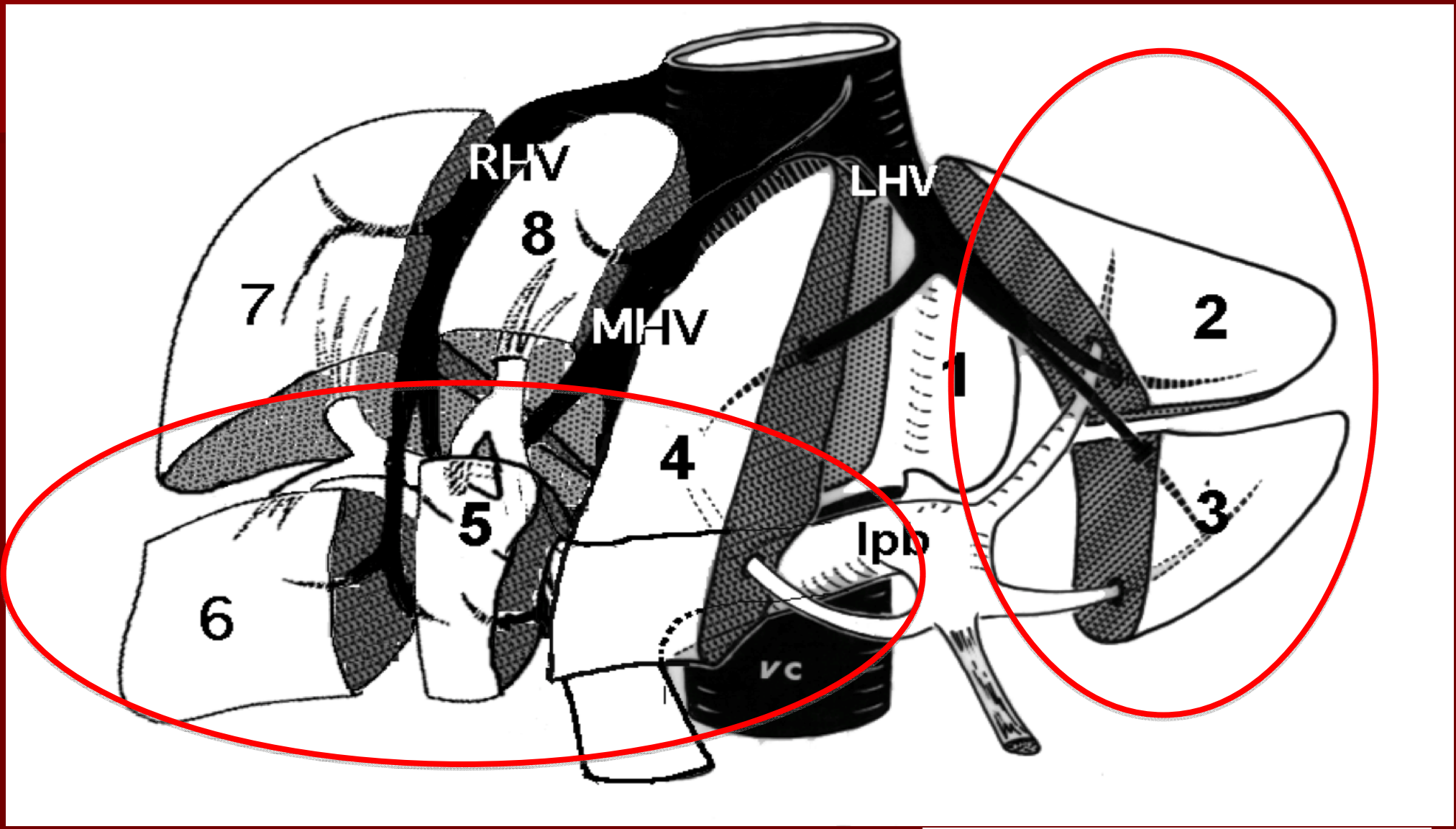
Nguyen KT Ann Surg 2009;250

Laparoscopic hepatectomy: Patient Selection

- High rate of benign tumors
- Mostly small tumors
- Doubtful Surgical indication in confirmed (modern imagery) small benign lesion such as FNH, Hemangioma, Cyst ??
- Mainly claimed as symptomatic (?)
- Does the technique change the indications ??

- **Indication of hepatectomy has to be strictly the same than open technique!!!**

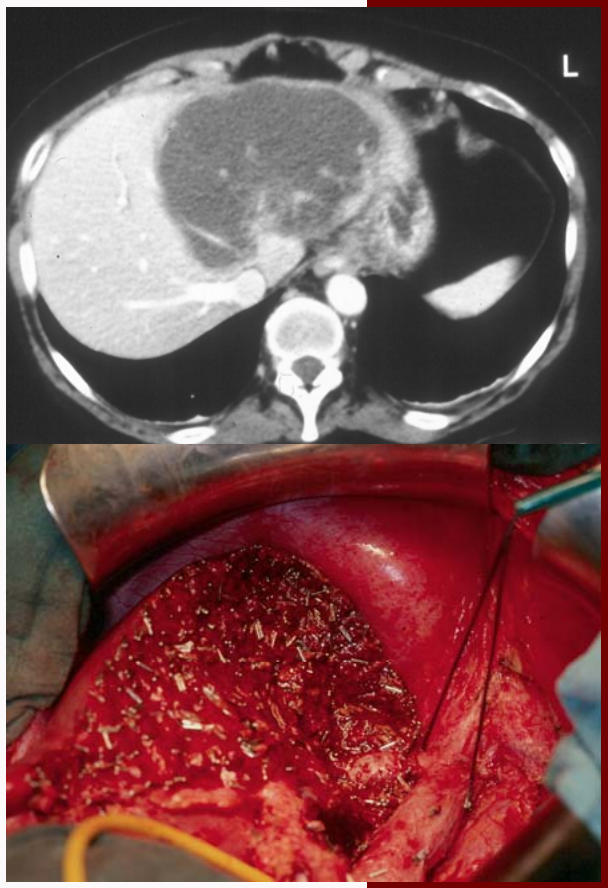
« Laparoscopic » segments of the liver



Cherqui D. Ann Surg 2000;232:753

TABLE 3. Indications and Contraindications for Laparoscopic Liver Resection

Contraindications
Any contraindications to open liver resection : high-risk patients, liver failure, severe coagulopathy
Patients who cannot tolerate pneumoperitoneum : cardiac failure, persistent foramen ovale
Dense adhesions that cannot be lysed laparoscopically : increase the risk of conversion !
Lesion too close to major vasculature **or the hilum**
Lesion too large to be safely manipulated laparoscopically **(invasive, large tumor)**
Resection that requires extensive portal lymphadenectomy : **vascular or biliary reconstruction**



Left extended hemihepatectomy for intrahepatic cholangioK

Nguyen KT Ann Surg 2009;250

Laparoscopic hepatectomy :

1. LLR is a beneficial procedure if :
   - performed by **experienced teams**
   - in well **selected cases**, i.e. tumor at distance from large central vessels

2. No **oncological** disadvantage has been demonstrated untill now
3. Need of long-term oncological datas
4. **Indications** should not be influenced by minimal invasive approach

Diagnosis Laparoscopic for Trauma - Indications

- Suspected intra-abdo injury after blunt or penetrating trauma
- Suspected intra-abdo injury despite negative work-up after blunt trauma
- Abdo gunshot wounds doubtful intraabdo trajectory
- Abdo stab wounds with proven penetration of fascia
- Diagnosis of diaphragmatic injury

Level I - III

SAGES Guidelines, Surg Endosc, 2008

Diagnosis Laparoscopic for Trauma - Contraindications

- Hemodynamic instability PAS < 90 mm HG
- Frank peritonitis, hemorrhagic shock, evisceration
- Posterior penetrationg trauma with high likehood of bowel injury

- Limited laparoscopic expertise

Level I - III

SAGES Guidelines, Surg Endosc, 2008

Laparoscopic approach during pregnancy ...

- Indications = non-pregnant patient
- 1 Pat / 635
- Lap can be safely done during any trimester
- Historical recommendations : T2
- Risk of abortion : T1 and T3

- Patient positioning (LLP), initial port placement (Hassan), insuflation pressure < 15

Level II

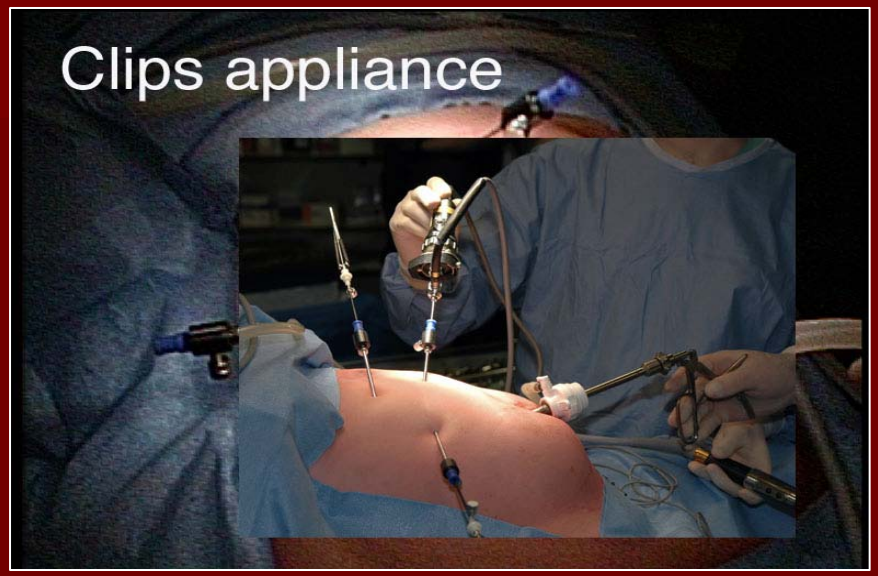
Jackson, Surg Endosc, 2008
Corneille, Am J Surg, 2010

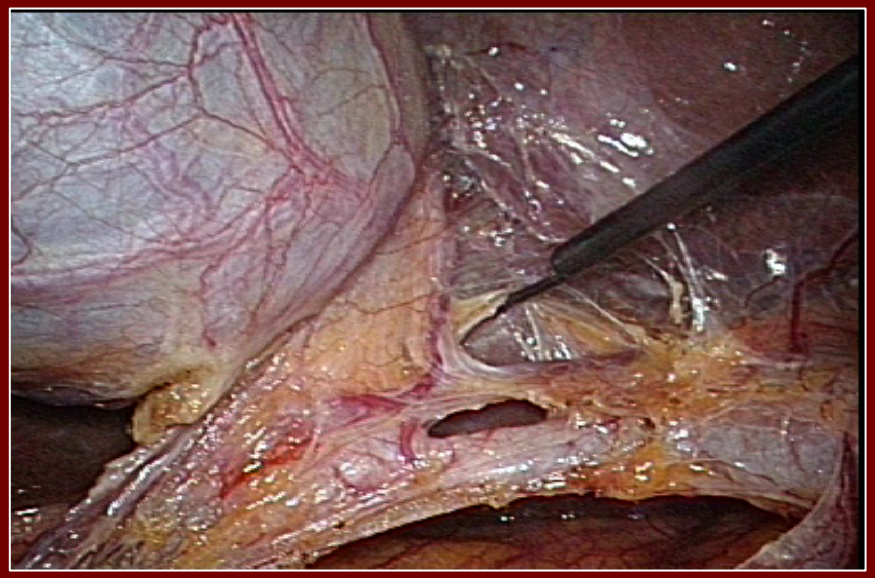
Table 11. LAPAROSCOPIC OPERATIONS DEGREE OF DIFFICULTY SCALE (1 TO 10, 10 MOST DIFFICULT)

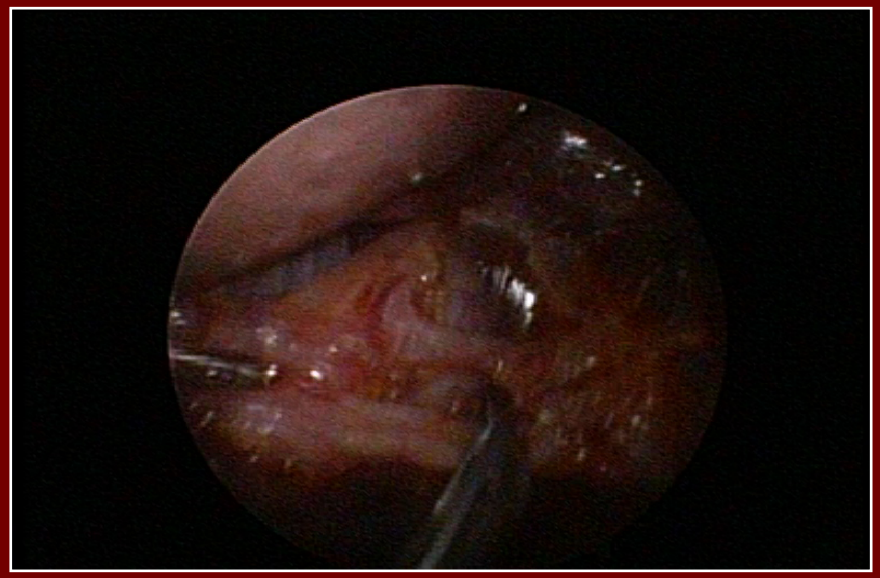
Lap cholecystectomy	3.0
Lap appendectomy	3.0
Lap hernia	4.0
Lap nissen	6.0
Lap splenectomy	7.0
Lap adrenalectomy	7.0
Lap colectomy	8.0
Lap esophagectomy	9.5
Lap gastric bypass	9.5

Schauer, Surg Clin North Am, 01

Needlescopic cholecystectomy ?







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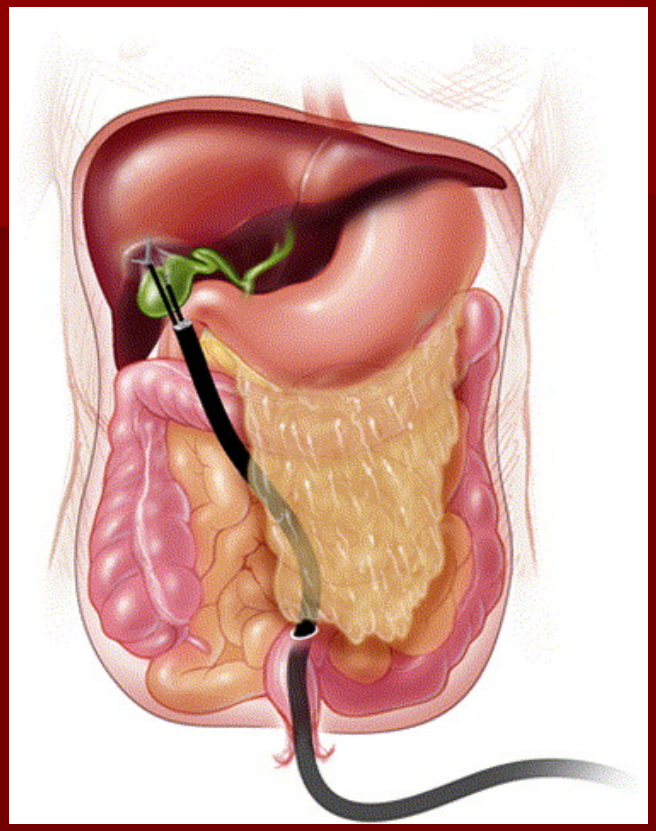
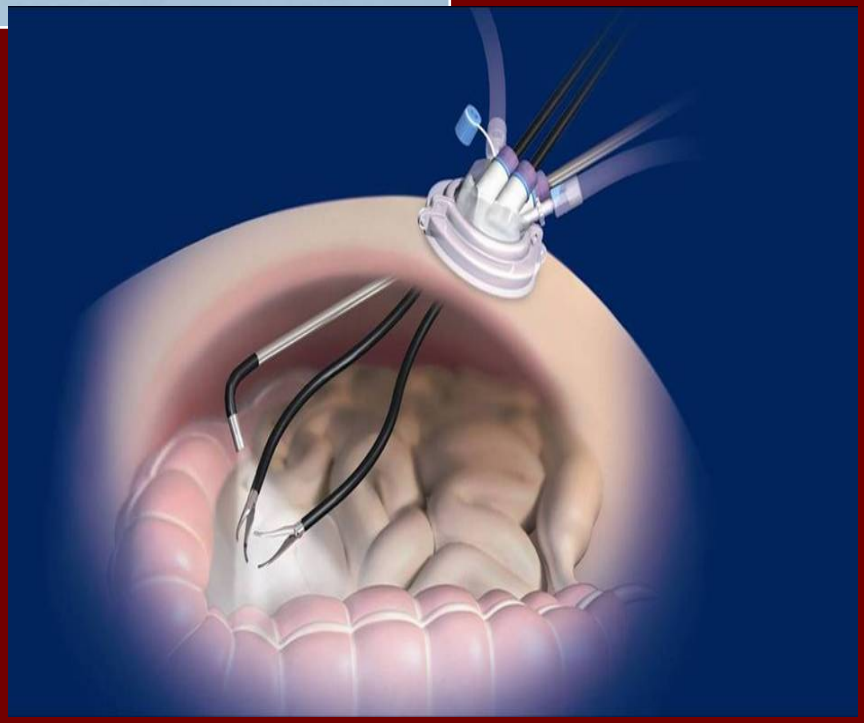
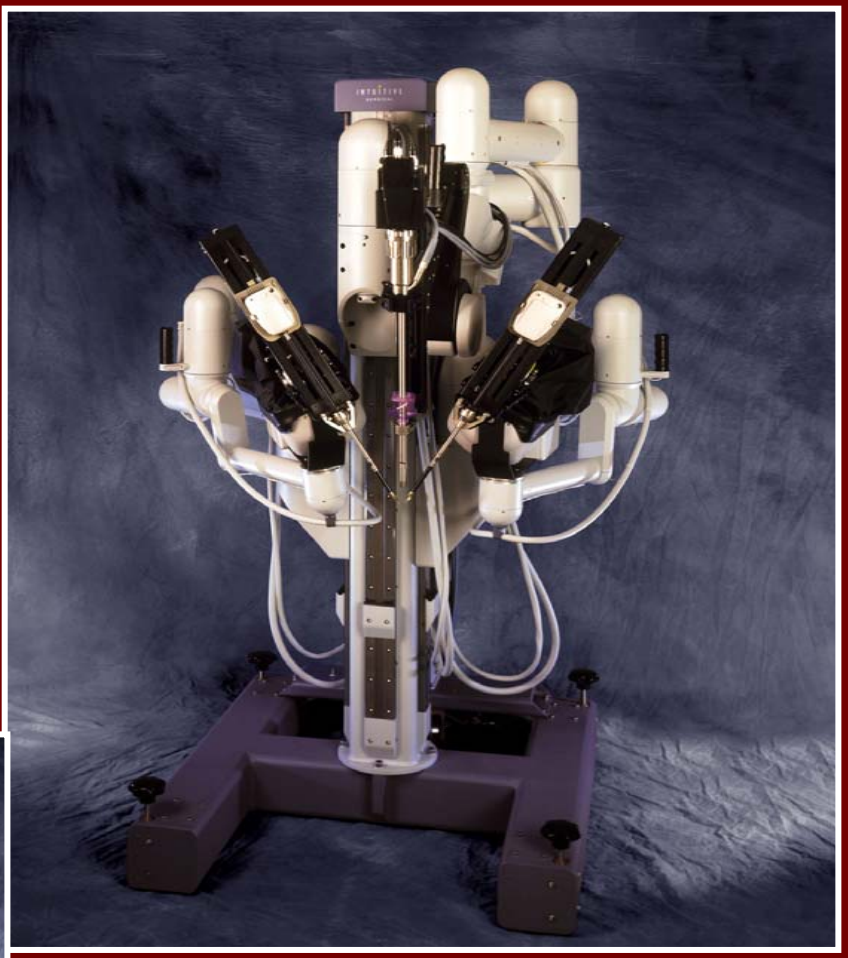


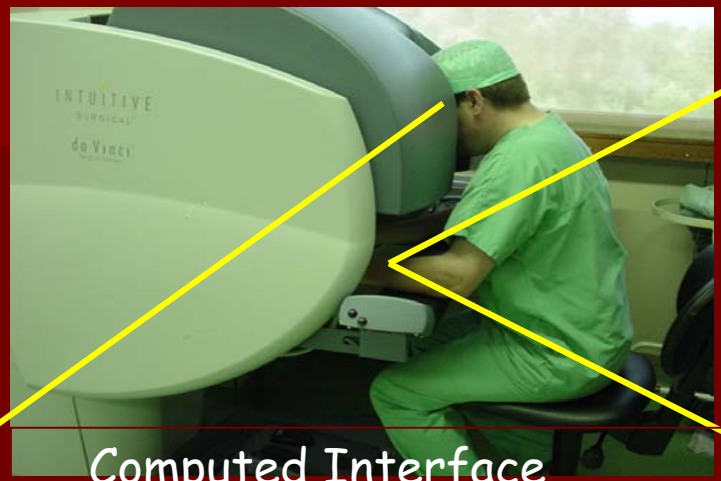


NOTES – SILS ?



ROBOT ?

Robot- Assisted Surgery



3D - Vision

Computed Interface

Degree of freedom

Dexterity

Stabilization

Extension of

Minimal Invasive Surgery

World's First Telesurgery

PROJECT LINDBERGH

New York

Strasbourg

7 Sept. 2001

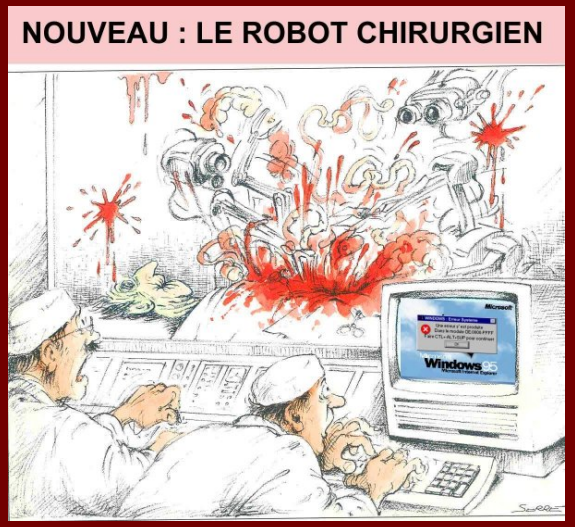
14000 Km (8750 Miles)

OC 3 Asynchronous Transfer Mode

10 Megabytes /sec fiberoptic

155 +- 40 millisec. delay

Robot ... ?



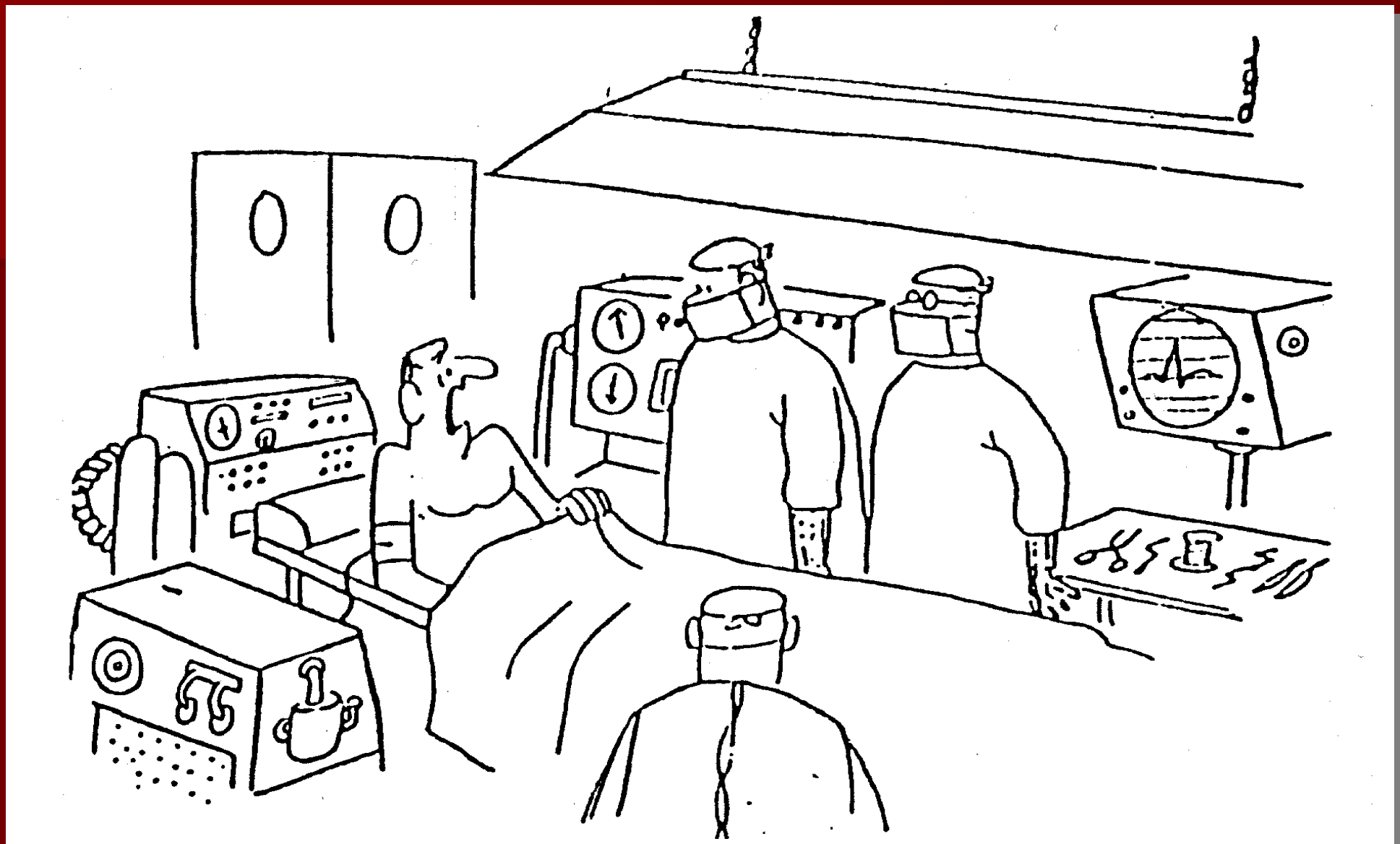
- Robot system (da Vinci,...)

  No advantages

  More time consuming, more expensive

Level III

Hubens, Surg Endosc, 2008
El Nakadi, Closset, WJS, 2006
Scozzari, Surg End, 2011



I don't care how many doctors are here!
Is there an electrical engineer, too?

HOPITAL ERASME

Intranet

Merci pour votre attention …