The main issues of the rectal resection for carcinoma

- Level of the vessels transection and mobilisation of the splenic flexure
- Lymphadenectomy
- Distal margin
- Parietal invasion of rectal wall
- …Functional results

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Level of the section of IMA ?

- **Pezim ME & al. Ann Surg 1984; 200 (6): 729-33**

Retrospective study. 1370 patients

Rectal and sigmoïd cancers. Dukes A,B,C

- ligature of the IAM at its origin vs distally
- No SD on survival at 5 years

- **Surtees P & al.Br J Surg 1990; 77 (6): 618-21**

Retrospective study 250 Dukes C / 4250 pts

Rectal cancer

- No SD on survival at 5 years

Mobilisation of the splenic flexure

- Is mandatory for no tension on the anastomosis
- Is the first step of the procedure
- Should need the transection of the inferior mesenteric vein
- By laparoscopy the medial approach is helpful

The medial-to-lateral approach dissection sequence

- Is the most appropriate procedure for laparoscopic resection of rectosigmoid cancers
- in a randomized controlled study versus a traditional lateral-to-medial (67 patients)
- in terms of operating time, costs and is possibly less invasive with a similar recurrence rate

Liang JT, World J Surg, 2003,27,190

LYMPHADENECTOMY

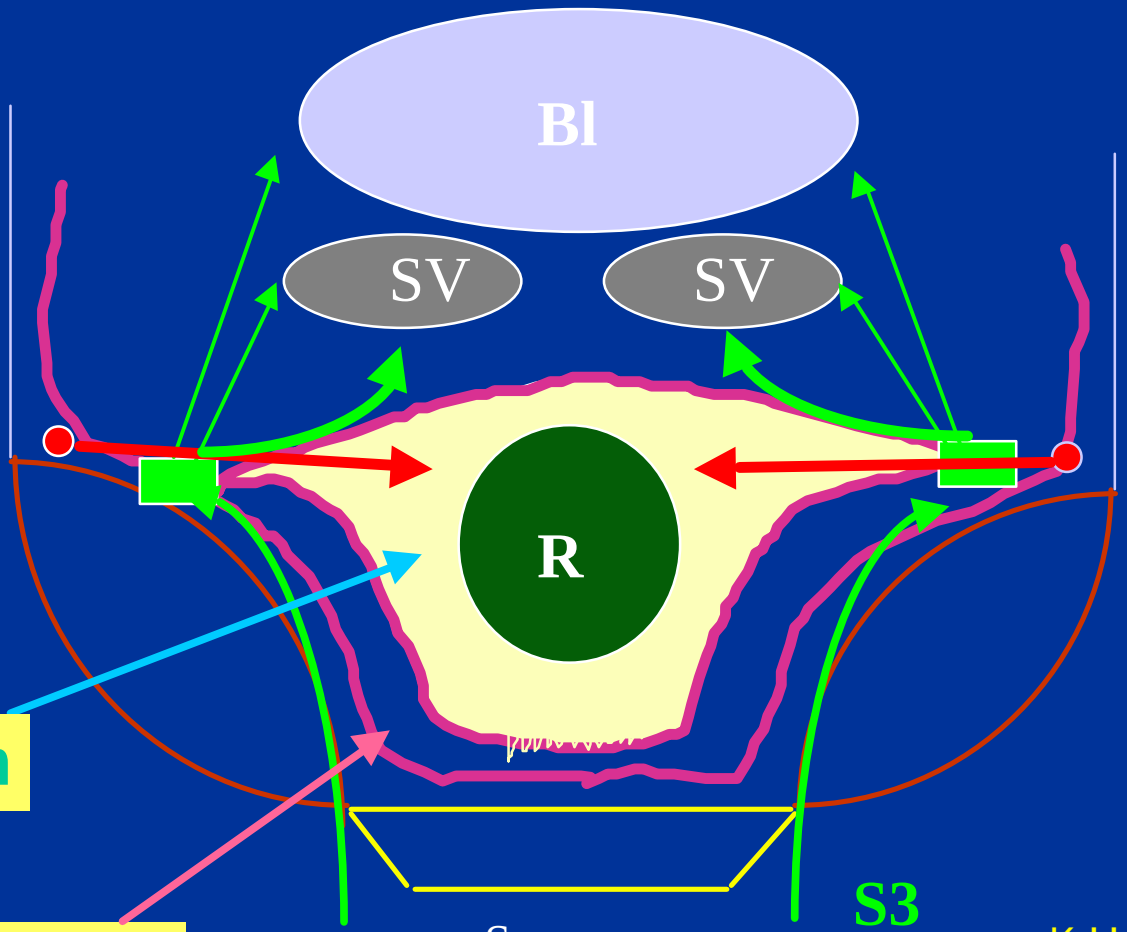
- One japonese article concludes to its interest (Watanabe,Surgery,2002,132,27).
- Another randomized study on 51 patients with preoperative radiotherapy concludes that extensive lymphadenectomy is useless in terms of survival and favours more urinary and sexual dysfunction (Nagawa, Dis Colon Rectum, 2001,44,1274).

DISTAL MARGIN

- Involvment of rectal wall beside 5cm is unfrequent.
- For 80 % of tumors, the microscopic margin is the macroscopic one.
- In 15 % the microscopic extension is only at a few millimeters of the inferior limit of the tumor.
- A 2 cm distal margin is sufficient in the majority of the cases.

N. WILLIAMS, Br. J. Surg. 1984, 71, 575

THE MESO-RECTUM



Inf Hypog Plexus

Mid H° Art

Mesorectum

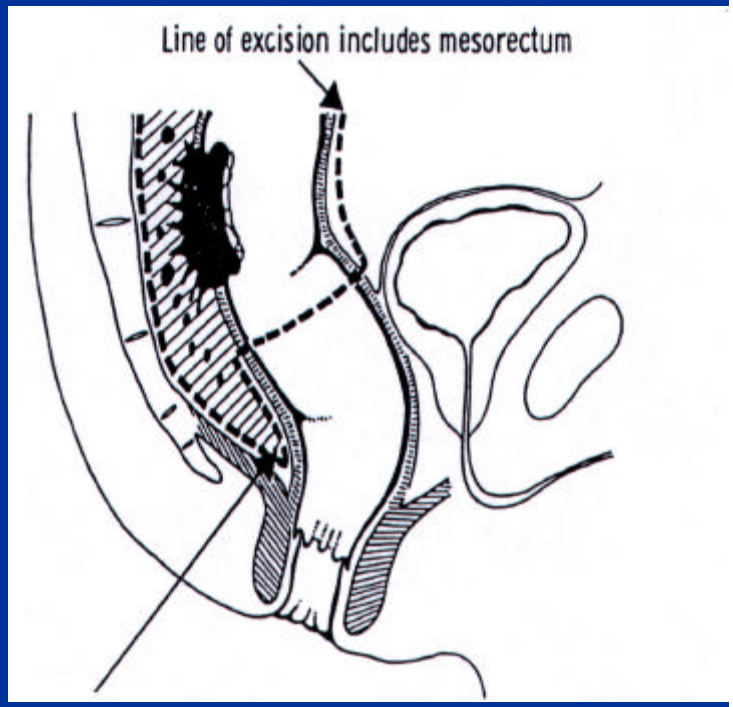
Recto sacral Fascia

K Havenga Br J Surg 1996, 83,384-388

TOTAL MESORECTAL EXCISION 1

Technic :

- Careful dissection of autonomous nerves
- No touch the tumor
- « Holy » avascular plan
- Total mesorectum resection
- Distal rectal Clearance (2-4 cm)
- High vascular ligation
- Pathological control of the distal section



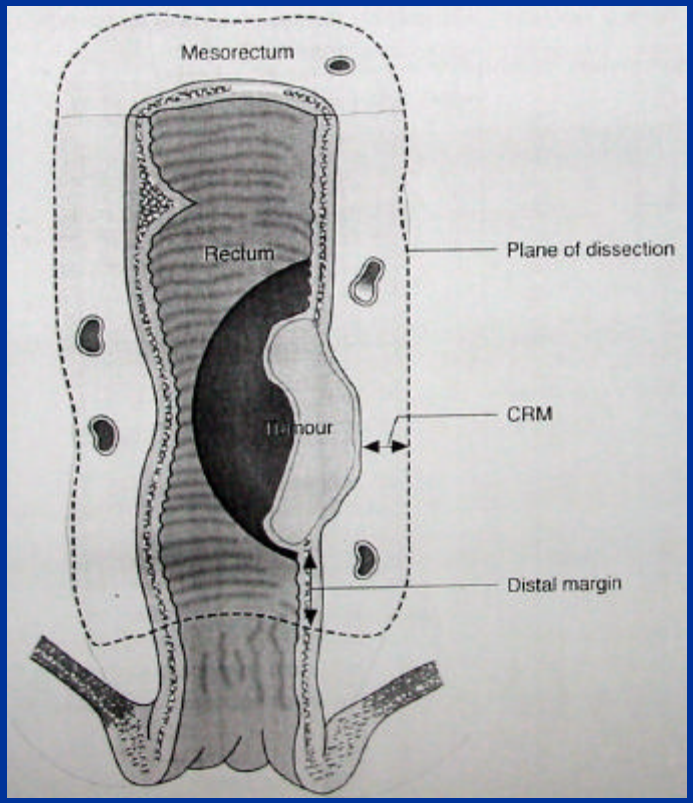
RJ Heald & al. Br J Surg 1982; 69: 613-16.
Mac Farlane & al. Lancet 1993; 341: 467-70

TOTAL MESORECTAL EXCISION 2
lateral margin

Independant pronostic factor

- On local recurrence
- On distant metastasis
- On survival rate

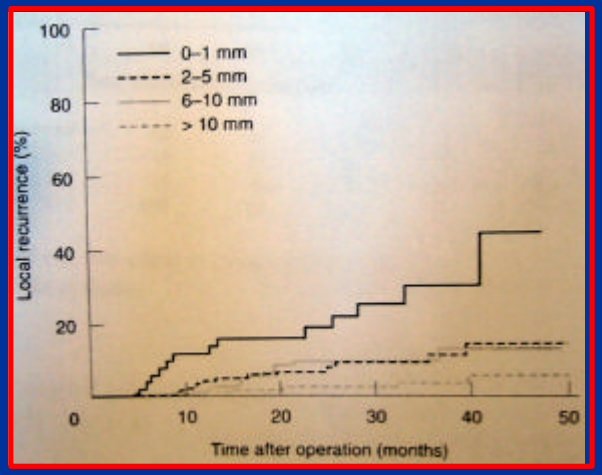
Analysis of the specimen on fixed tumor is mandatory

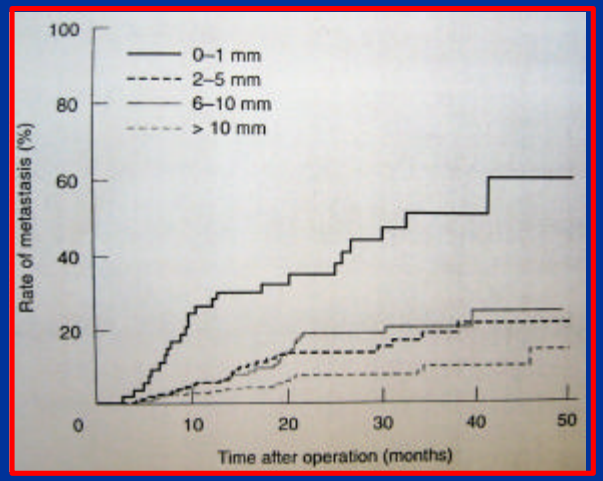


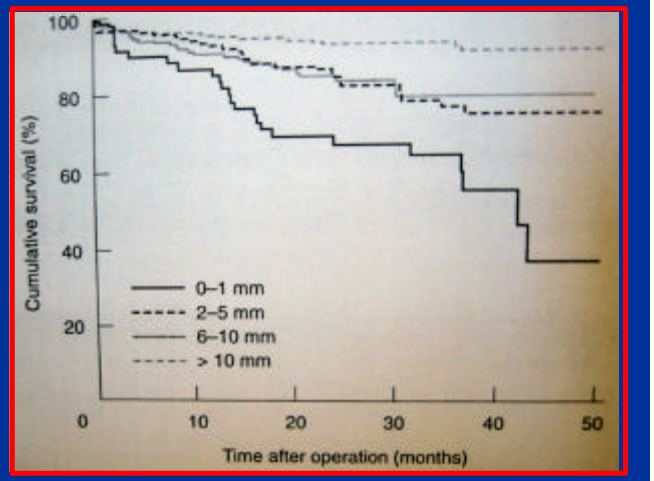
J Am Coll Surg 1997; 184: 84-92

TOTAL MESORECTAL EXCISION 3
lateral margin

Prospective study 686 patients TME Median follow-up 29 months







LR Recurrence

5% if > 1mm

22% if < 1mm

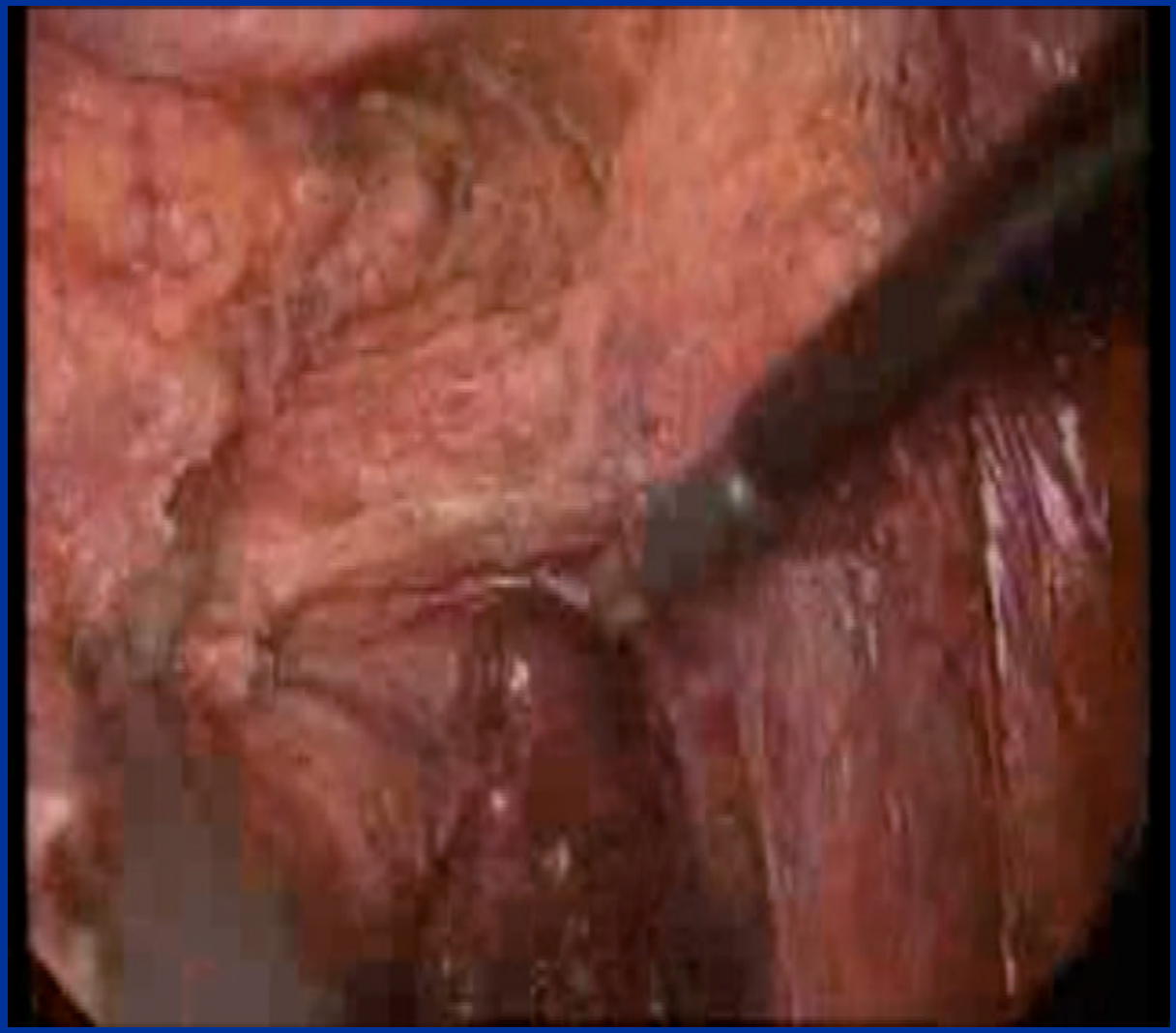
Metastatic risk at distance : X4,7 si < 1mm

Mortality due to the cancer : X3,7 si < 1mm

Norwegian Rectal Cancer Group, Br J Surg 2002, 89: 327-34

Total mesorectal excision is optimal surgery for rectal cancer

R Heald Br J Surg 1995,82,1297



TOTAL MESORECTAL EXCISION

When it is systematically done, the risk of local recurrence decreases from 11% to 3 %

Arbmann G Br. J. Surg.,1996,83,375

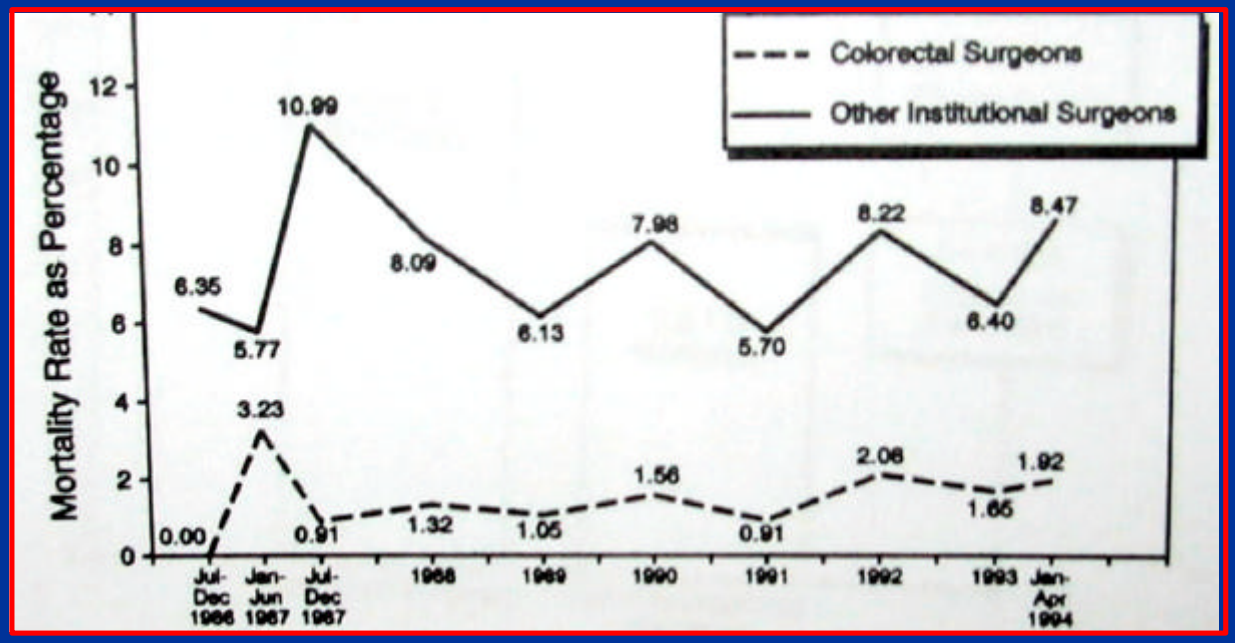
IMPACT of SURGEON and INSTITUTION Postoperative mortality

Rosen & al, Dis Colon Rectum 1996, 39 (2), 129-35.

2805 colorectal carcinoma (1986-1994) :

✍ comparison of postoperative mortality rate between ;

- colorectal surgeons : 1,4 %
- general surgeons : 7,3%



IMPACT of SURGEON and Institution on oncologic prognostic

Studies Stockholm I et II, Holm & al, Br J Surg 1997, 84, 657-63.

	Ajusted hazard ratio	
	Local recurrence	Mortality
Surgeons		
Years in practice		
< 10 y	1.0	1.0
> 10 y	0.8 (0.6-1.0)	0.8 (0.7-0.9)
Nbr. of procedures/y		
1- 3	1.0	1.0
> 3	0.9 (0.7-1,2)	0.9 (0.7-1.1)
Institution		
Nbr. of procedures/y		
< 5	1.0	1.0
>10	0.7 (0.5-1.1)	0.9 (0.7-1.1)
Teaching Hosp	0.7 (0.5-0.9)	0.8 (0.7-1.0)
GI Hosp	1.0	1.0

IMPACT of SURGEON Continuous Medical Education !

Lehander Martling & al, Lancet 2000; 356: 93-96

Swedish trial.

381 patients CR operated by surgeons in CME : *study compared to the* Stockholm I et II trials

	CME	Stockholm I	Stockholm II	p
Miles (%)	27	55	60	< 0,0001
LRR (%)	6	15	14	< 0,002
Death (%)	9	15	16	

TME

for Dukes B and C the recurrence rate is 5% to 8 % without adjuvant radiotherapy

W. Encker, Cancer 1996, 78, 1847

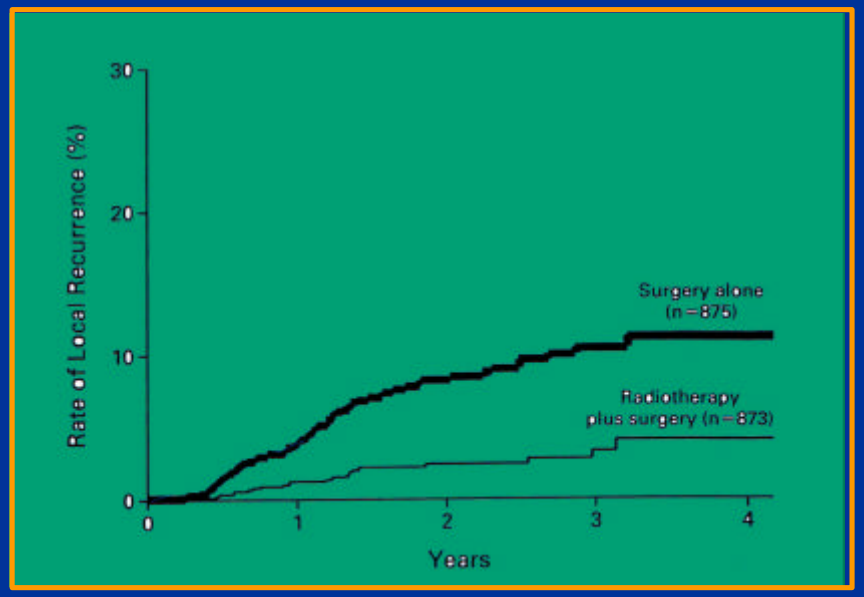
R. Heald, Lancet 1993, 341, 457

Preoperative radiotherapy

Dutch Colorectal Cancer Group. N Engl J Med 2001; 345: 638-646.

- 1805 CRC, stage 0-IV : 897 RTE + TME vs. 908 TME
- Survival 2 years : 82% vs. 81,8%. p= 0,84
- **LR recurrences** : **2,4**% vs. **8,2**%. p < 0,001
  - < 5 cm / MA
  - 5,1 – 10 cm / MA
  - Stage TNM II-III

…, the decision not to irradiate before surgery should be carefully considered.



Functional results after radiotherapy

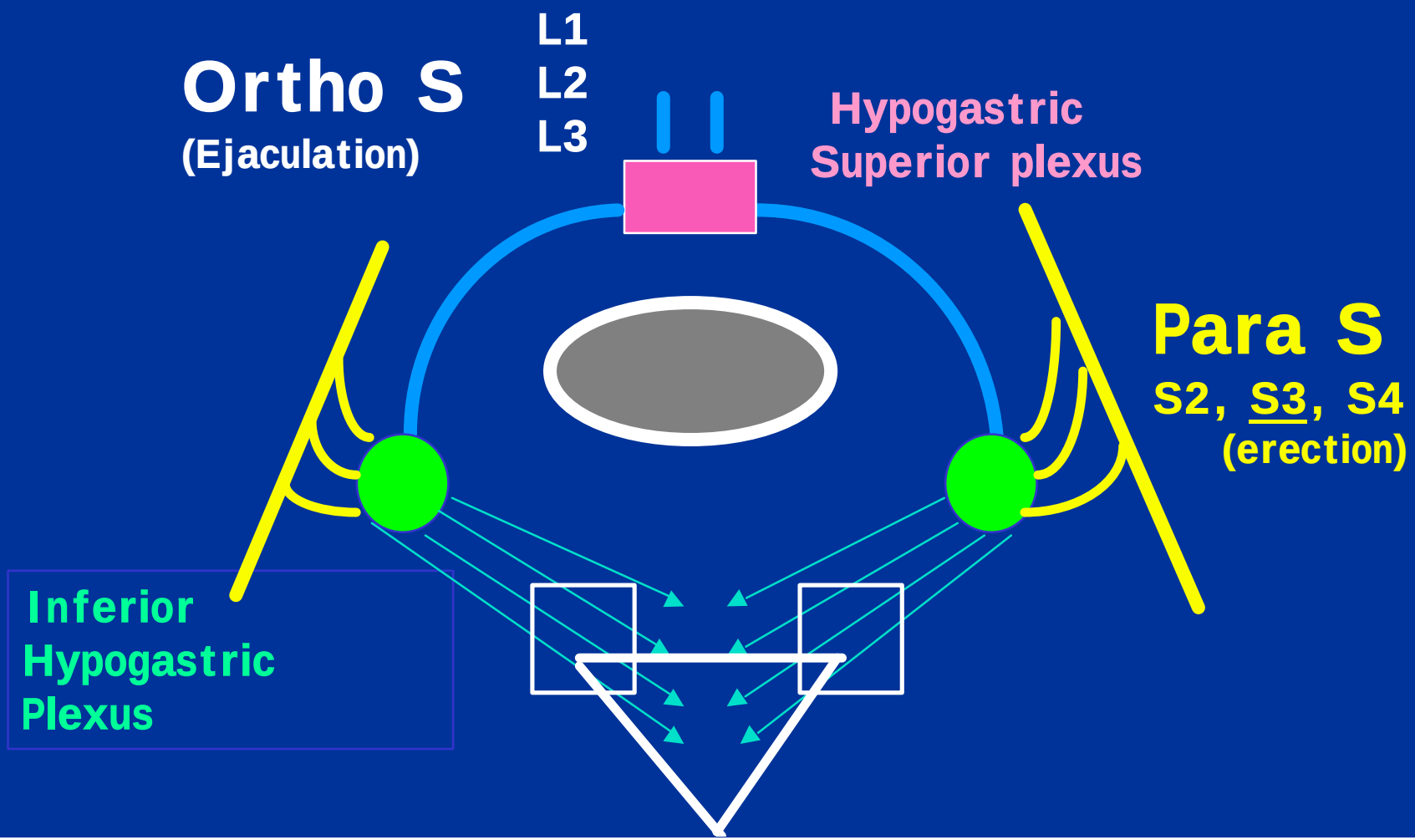
- Number of stools ($p<0,001$)
- Incontinence and urgencies ($p<0,001$)
- Difficulty for exoneration ($p<0,05$)
- Quality of life impaired for 30% of irradiated patients vs 10% ($p<0,01$)

Dahlberg M, Dis Colon Rectum,1998,41,543

FUNCTIONAL RESULTS

- Nerve sparing
- Sphincter save operation
- Colonic J pouch

PELVIC NERVES



Sexual and urinary preservation

Preservation of the innervation diminishes dysfunction

	Total	Partial	No
•Nl erection	8/10	4/18	0/11
•Nl ejaculation	6/10	1/18	0/11

K. Hojo, Dis. Colon Rectum 1991, 34, 532

Sexual and urinary nerve preservation

- The best way to preserve the nerves is the dissection and a clear visualisation of the nerves
- TME has an oncologic interest and a fonctional one as well

DENONVILLIERS FASCIA

- Classification for the anterior dissection
  - *close to the rectum
  - *mesorectal outside of the propria fascia
  - *outside of the mesorectum
- Oncologic need or Quality of the functional results ?

Lindsey I,Br J Surg, 2000,87,1288

Preservation of the sphincter

- No better results for a margin more than 2cm

  W. Pollet, Ann. Surg. 1983, 70, 159

- Low colorectal and coloanal anastomosis are helped by mechanical staplers and by an endoanal approach

  R. Heald, Dis. Colon Rectum 1997, 40, 747

  M. Huguier, Am. J. Surg. 1997, 174, 11

Colonic pouch ?

- Quality and number of the stools are an important issue after low colorectal or coloanal anastomosis
- A J shape reservoir decreases the risk of fistula
- Fistulas : 30 to 5 % (Slow.Choen Br. J. Surg 1995, 82, 608)
- n of stools > 4 73 to 33 % (Ortiz Dis.Colon Rectum 1995, 38, 375)

O. Hallböck, Ann. Surg. 1996, 224, 58

	reservoir	no reservoir
	45	52
• n of stools	2	3,5
• Night stools	7%	24%
• Urgencies	7%	45%
• Fistulas	2%	15%

LAPAROSCOPY and RECTAL RESECTION

- In 2001 (Chapman,Ann.Surg,234,590), the australian study (ASERNIP-S) reviewed 52 articles to compare open surgery and laparoscopic approach : the latter has postoperative advantages but no conclusion for long-term follow-up.
- A randomized study (269 pts, 56 carcinoma of the rectum operated in 20 months) has shown better results for postoperative morbidity in laparoscopic group. (Braga M,Ann.Surg,2002,236,759).

QUALITY OF TME

- The quality of the resection is the same (margin, number of lymph nodes)
- 21 laparoscopy vs 22 laparotomies : conversion rate 50% (**Hartley J, Dis Colon Rectum,2001,44,315)**
- 101 laparoscopy vs 233 open (**Anthuber M, Dis Colon Rectum,2003,46,1047**)
- Survival and recurrence rates are similar

Laparoscopy Versus Open for rectal Cancer

- PubMed:
  - 317 articles, 15 PR, 2 meta analysis
- CLASSIC trial
  - « Impaired short-term outcomes after assisted anterior resection do not justufy its routine use »
    - More conversion
    - Positive lateral margin : 12% vs 6%
- Meta analysis : Aziz et aL. Ann Surg Oncol 2006
  - 20 articles 1993 - 2004
  - 2071 patients : 909 Lap (44%) vs 1162 Open (56%)
  - 13/20 > 20 patients in each group
  - 7/20 follow-up > 24 months
  - Conversion : 0% - 34%

Parameters	N articles	No	Lap / Open	OR/WMD	P
Operation		Lap / Open	Lap / Open		
Operative duration	12	324 /467	–	40.18	S
positive lateral margfin	8	359 / 424	9.5% / 10.8%	.93	NS
No. nodes	17	550 / 925	–	- .87	NS
Complications postop précoces					
Mortality	12	425 / 838	3.1%, / 3.2%	.6	NS
Hémorrage	7	422 / 428	5.7%, / 4.4%	1.24	NS
Fistula	8	533 / 627	8.4%, / 6.7%	1.28	NS
Complications perineal	5	101 / 235	2.3% / 16.2%	1.03	NS
Sepsis parietal	12	496 / 388	8.9% / 10.1%	.84	NS
Infection respiratory	10	448 / 333	7.4% / 4.5%	1.47	NS
Ileus	7	156 / 167	5.1% / 8.4%	.62	NS
Thrombosis, pulmonary embolism	4	330 / 328	6% / 1.9%	.58	NS
Urinary retention	9	223 / 358	7.7% / 10.3%	.91	NS
Postoperative rehablitation					
Transit (stomy)	5	96 / 215	3.2d vs 4.4d	- 1.52	S
Transit	5	98 / 99	3d vs 4d	- .72	S
Delay for drinking	5	108 / 222	–	- 1.57	NS
Delay for feeding	9	269 / 409	–	- .92	S
Duration of analgesy IV	6	132 /137	–	- .44	NS
Duration stay	16	476 / 892	–	- 2.67	S
Late complications					
Obstruction	5	114 / 233	1.8%, / 5.6%	.40	NS
Incisional hernia	6	144 / 269	4.2% / 3%	1.28	NS

Bladder and sexual dysfunction following laparoscopically assisted and conventional open mesorectal resection for cancer.

Quah HM & al. Br J Surg 2002, 89: 1551-56.

Prospective study

- 111 patients => 80 answers (40 / 40)
- Groups : similar
- Urinary sequella : 2 vs 0 NS
- Sexual sequella (men) : 7/15 vs 1/22 p: 0,004
- No difference for women

- Particularly for huge and low tumors

Bladder and sexual function following resection for rectal cancer in CLASSIC Trial. Jayne DG et al. Br J Surg 2006

- CLASSIC Trial
  - 794 patients
    - 347 included. 247 questionnaires
    - Questionnaires
      - I-PSS (international Prostatic Syndrom Score), IIEF (International Index of Erectile Function), FSFI (Female Sexual Function Index)

	Lap AR	Open AR	Lap Colect.
N	74 RA / 20 AAP	34 RA / 12 AAP	99
Delay : Surgery/ Questionnaire			
0-12 months	26%	26%	17%
>12 months	74%	74%	83%
TME	**80%**	62%	
Conversion	34%	12%	
Normal urinary function	65%	65%	79%
Distance : cancer / anal margin	**10 (5-15)**	10 (5-15)	

Bladder and sexual function following resection for rectal cancer in CLASSIC Trial. **Jayne DG et al. Br J Surg 2006**

- Urinary function
  No difference Lap vs Open

- Sexual activity
  - Men
    - Severe modifications : 41% (Lap RA), 23% (Open RA), 4% (Lap Colect)
    - Erectie function and ejaculation
    - No improvement

  - Women
    - Severe modifications : 28% in Lap AR, 18% in Open AR, 8% in Open CR
    - No différence Lap vs Open

- Predictive factors
  - Conversion
  - TME > PME

Survival after Laparoscopy

	Year	N	AR /Miles	Mort.	Morb.	Local recurrenc	Parietal recurrenc	Follow-up	Survival
Yamamoto	2002	70	93%/ 7%	0%	18.6%	2.9%	0%	17.5	100%
Poulin	2002	80	65%/35%	2.5%	19%	3.7%	0%	23	65.1%
Scheidbach	2002	380	39%/61%	2%	37.6%	0%	0%	14	100%
Feliciotti	2003	81	74%/26%	0%		21%	0%	43.8	62.5%
Leroy	2003	102	85%/15%	2%	27%	6%	0%	36	65% (5y)
Morino	2003	100	100%/-	2%	12%	4.2%	1.4%	45.7	74%(5y)
Leung	2004	203	100%/-	2.5%	23.2%	6.6%	0%	52.7	76%(5y)
Bretagnol	2005	144	100%/-	1%	34%	1.4%	0%	18	89%
Lechaux	2005	179	154/23	1.5%	29%	3.9%	0.8%	76	78%(5y)
Bärlehner	2005	194	91%/8%	0%	20%	4.1%	0.5%	46.1	78.9(5y)
Dulucq	2005	142	100%/-			6.8%	0%	57	67%(5y)
Tsang	2006	105	100%/-	0%	24%	4.8%	0%	26.9	81%(5y)

CONCLUSIONS

- Total mesorectal excision is done in very good condition
- Short follow-up is the same for laparoscopy and laparotomy
- For long term follow-up the first monocentric studies are encouraging
- Functional results ?