Laparoscopic vs Robotic Rectal Cancer Surgery: Making it better!

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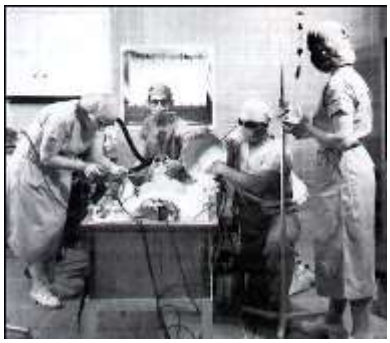
In all situations:
We have to use the right tool for the job

The wrong tool will cause serious problems

The right person has to do it!

The times are changing!

- In the mid 90's
  Only 6% of surgeons would have a laparoscopic surgery for rectal cancer themselves.
  Steve Wexner DCR 1995:38:723
- The same question was asked at a recent Colorectal Meeting in Taiwan in 2010
- Everyone present including Steve Wexner said they would choose laparoscopic surgery if there was a skilled surgeon to do it



The laparoscopic approach to rectal cancer has definite short term advantages and no disadvantage in terms of local recurrence.
Standacher & Vignali
World J Gast Surg 2010 2(9):275-82.

The place of laparoscopic surgery: COLOR ll trial Rectal Cancer

- The COLOR II trial: Lap 699 vs Open 345 eligible patients.
- The use of laparoscopic rectal resection by skilled surgeons resulted in similar safety
- **Resection margins and completeness of excision cf to open surgery with improved recovery.**
- Van der Pas et al Lancet Oncol 2013 14:210-8

Meta-analysis Laparoscopic colorectal cancer

- Medline, Embase, and Cochrane Library were systematically reviewed **Fifteen trials with 4,207 patients were included.**
- The combined results of the individual trials showed no statistically significant difference for overall recurrence (P = 0.34), local recurrence (P = 0.20), distant metastasis (P = 0.95), wound-site recurrence (P = 0.16), colorectal cancer-related mortality (P = 0.07), colon cancer-related mortality (P = 0.20), rectal cancer-related mortality (P = 0.16), and overall mortality (OR 0.87, 95% CI, 0.73-1.73, P = 0.11) between the laparoscopic surgery and open surgery groups**. The overall complications in the laparoscopic surgery group were much lower than that in the open surgery group** (OR 0.71, 95% CI, 0.58-0.87, P = 0.001). This meta-analysis showed that the successful laparoscopic colorectal resection for colorectal cancer was as effective as open surgery in terms of the oncological outcomes, thereby suggesting that **laparoscopic surgery can be continued In patients with colorectal cancer.**
- Med Oncol. 2010 May 11. Shanghai China

Laparoscopic Rectal Resection

- **Patients who underwent elective LAR or open proctectomy for cancer during 2005 to 2009 were identified from the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) database.**
- **5,420 patients underwent surgery for rectal cancer, 4,380 underwent open proctectomy and 1,040 (19.2%) LAR.** The LAR group had a lower frequency of blood transfusion (12.3% versus 4.3%; $p < 0.0001$) and a longer mean operative time (242 versus 219 minutes; $p < 0.0001$). Median length of stay was 5 days after LAR and 7 days after open resection ($p < 0.0001$). Although no difference in 30-day mortality was detected, the frequency of complications was less after LAP (20.5% versus 28.8%; $p < 0.0001$). Specifically, the frequencies of superficial surgical site infection, sepsis, respiratory complications, renal failure, and venous thromboembolism were each lower in the LAR group. After adjusting for potential confounders, the likelihood of **30-day morbidity was significantly greater in open versus laparoscopic proctectomy** (odds ratio = 1.41; 95% CI, 1.19-1.68).
- Compared with open proctectomy, LAR is associated with decreased length of stay and 30-day morbidity. If ongoing randomized clinical trials confirm oncologic equivalency, **LAR might eventually replace open resection as the standard of care for the treatment of patients with resectable rectal cancer.**
- J Am Coll Surg. 2011 May;212(5):844-54 Greenblatt et al Wiconsin USA

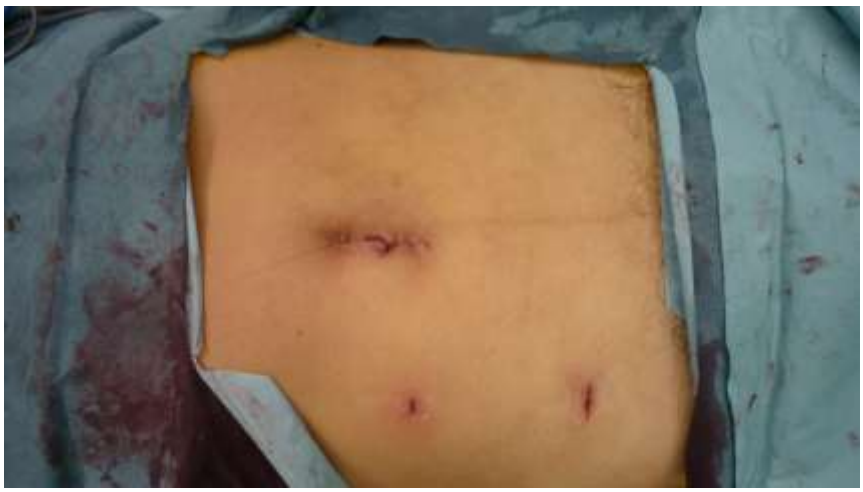
Previous laparoscopic wounds

The use of an extra LIF wound for extraction subtracts from the cosmesis of lap ULAR

Present Laparoscopic wounds

AR 3 ports

ULAR-3 ports



AR 3-ports

33 yo F T3N1

Laparoscopic ULAR: How I do it

- 3 port technique
- 10 mm umbilical port for camera
- RIF 10/12 port medial to ASIS
- 5 mm in between these two
- LIF port usually not needed
- One nurse assistant

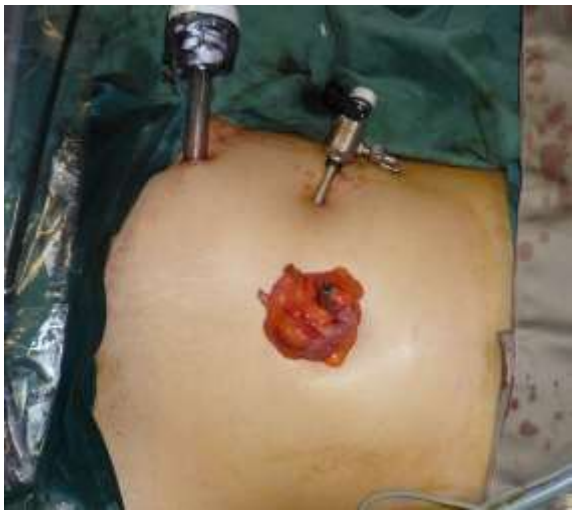
External uterine manipulator

Uterine manipulator

Exteriorizing colon after camera removal

Transecting rectum after exteriorization

Introduction of colon into abdomen



Re-insertion of camera port

Ultra low anterior resection

So why are many surgeons still not doing laparoscopic rectal surgery?

- Long term outcomes are still uncertain including cancer survival, urinary and sexual function
- It is technically demanding
- It is too expensive

The problem with laparoscopic surgery

- Of 488 laparoscopically assisted procedures attempted, 143 (29.3 per cent) were converted to open operation.
- Multivariate analysis showed that **intraoperative conversion was more likely with larger BMI, in men, patients with lower rectal cancer, those graded ASA III or when there was greater local tumour spread.**
- Br J Surg. 2008 Feb;95(2):199-205 Thorpe et al Leeds UK

So what about Robotic Rectal Surgery

Systematic review and meta-analysis Robotic vs Laparoscopic rectal surgery 1

- **Systematic review** including electronic searches and communications at robotic meetings.
- **Five Case controls studies with 486 patients (203 RAR vs 283 LAR).**
- **Conversion rate lower for RAR;** RR=0.31; 95% CI 0.12,078)
- **No significant differences in oncological outcomes, hospital stay or anastomotic leakages**

Ortiz-Oshiro et al Madrid Spain, Int J Med Robot 2012; 8:360-70

Systematic review and meta-analysis Robotic vs Laparoscopic rectal surgery 2

- A systematic review of all e databases: Pubmed, EMBASE, OVID, Medline, Cochrane Database of Systematic Reviews, EBM reviews and CINAHL
- **Eight non randomized studies with 854 patients: 344 (40.2%) in robotic group and 510 (59.7%) in the laparoscopic group** were found
- **Meta- analysis showed that conversion to open surgery was significantly lower in robotic group**(OR=0.26, 95%CL:0.12-0.57. p=0.0007)
- **No significant differences in operation time, LOS, time to diet, postoperative morbidity or mortality and the oncological accuracy of resection**

Trastulli et al Perugia Italy Colorect Dis 2012: 14:134-56.

Improved early post-operative results with Robotic rectal surgery

- A systematic review in electronic databases (pubmed, Science Direct, Google Scholar) from 2007 to 2011 looking for laparoscopic, robotic and rectal surgery
- **Robotic surgery associated with increased cost and OT time but lower conversion rate even in obese people, low rectal cancer, pre-operative chemoradiation regardless of the experience of the surgeon**
- **Marginally better outcome in anastomotic leak rates, circumferential resection margin positivity & perservation of autonomic nerve function**

Scarpinata R, Aly EH. Aberdeen, UK Dis Colon Rectum 2013; 56:253-62

Long Term Oncologic Outcomes

- **A total of 180 patients (sigmoid colon cancer stages 1-3) received either R-AR (n = 34) or L-AR (n = 146) between April 2006 and September 2008.**
- In this study, R-AR showed safety and feasibility in terms of perioperative clinical and long-term oncologic outcomes. **However, the advanced technologies of R-AR did not translate into better long-term oncologic outcomes compared with L-AR.**

Lim DR et al Surg Endosc 2013 Apr;27(4):1379-8 5Yonsei University College of Medicine, Seoul, South Korea

So in summary

- Laparoscopic surgery is equivalent if not better than open surgery for rectal cancer; especially in terms of short term recovery
- Robotic surgery is equivalent to laparoscopic surgery for most cases of rectal cancer but there is less conversion for the difficult low rectal cancers but there is no difference in oncological results.

My technique for robotic surgery in low rectal cancer

Left sided patient console docking
Ports inserted as shown
Gloved SILS device as shown
Totally Robotic surgery to anorectal junction
Removal of Patient console
Double stapling of AN junction
Exteriorization of rectum and cancer
Transection of tumour and creation of J pouch
Laparoscopic anastomosis performed
Creation of defunctioning ileostomy and closure

One docking for total robotic AR

Indications for robotic rectal surgery

- Very low Rectal Cancer
- Sexual Function important
- Male patients
- Obese patients
- Pre-operative Chemoradiation
- Large tumours

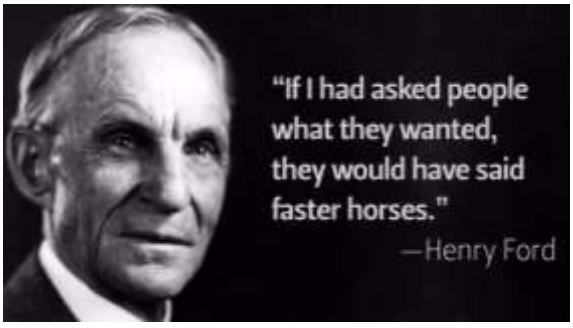
Master and Slave Unit

Some people think they are robotic surgeons

They frown on those who don't use the robot from start to end

Others don't use it!

- Others say we are great laparoscopic surgeons; we don't need the robot



Are you a robotic or Laparoscopic surgeon?

- Why do we need to choose?

Hybrid Robotic/Laparoscopic Surgery

- We are the master not the slave
- Use the techniques or combination of techniques that best serves the situation

Technology is getting more useful but the most important question is not whether we are using the latest technology!

Hybrid Robot/Lap/Reverse TME

- Why do we worry about mixing technology
- Why do we worry that others say we are not “pure” robotic or Lap surgeons

The more important question is: are we using them appropriately?

- Technology is good
- Surgical skill is important
- But intelligent usage is primary
- So mix and match to get the best result