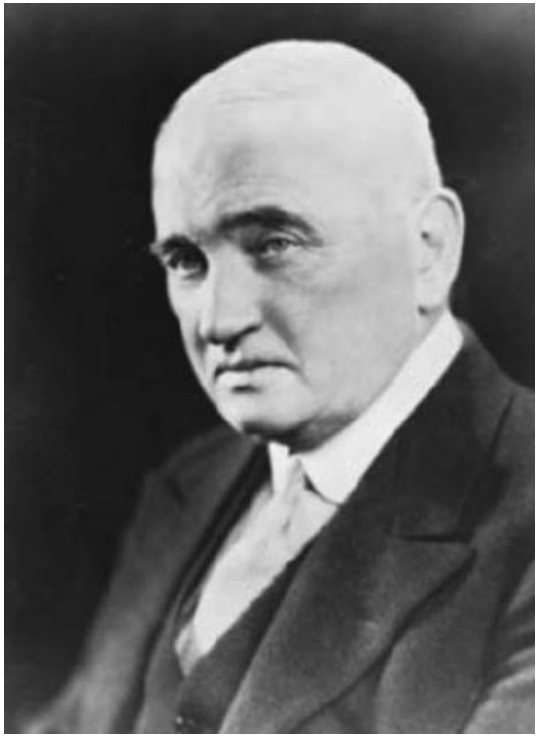
1ο Πανελλήνιο Συνέδριο Κολοπρωκτολογίας
Τεκμηριωμένη γνώση - εξατομικευμένη προσέγγιση

Λαπαροσκοπική προσπέλαση για τον καρκίνο του ορθού:

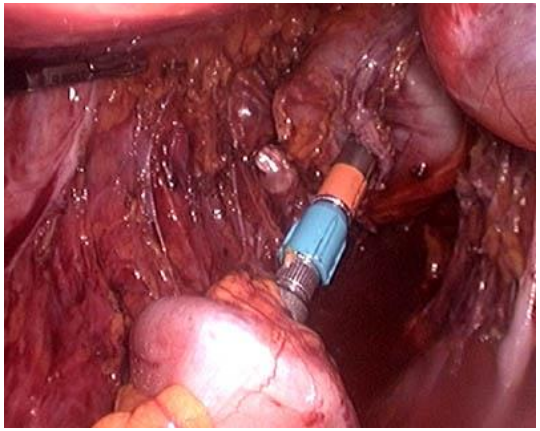
Σύγχρονες αντιλήψεις, πλεονεκτήματα και μειονεκτήματα έναντι της «ανοικτής»

Δημήτρης Π. Κορκολής
Χειρουργός
Γ.Α.Ο.Ν.Α. «Άγιος Σάββας»

Λαπαροσκοπική Χειρουργική στον καρκίνο του ορθού



William Ernest Miles (1868-1947)



Πλεονεκτήματα

- Μικρότερη απώλεια αίματος
- Ταχύτερη ανάρρωση
- Λιγότερος μετεγχειρητικός πόνος
- Λιγότερες επιπλοκές από το χειρουργικό τραύμα
- Ταχύτερη επάνοδος της εντερικής λειτουργίας
- Καλύτερο αισθητικό αποτέλεσμα
- Γρηγορότερη έξοδος από το νοσοκομείο

Vennix S, et al. Cochrane Database Syst Rev 2014
Zheng J, et al. Oncotarget 2017

Πλεονεκτήματα

- Ακριβέστερη παρασκευή των ιστών λόγω μεγέθυνσης
- Μικρότερος κίνδυνος ενδοκοιλιακών συμφύσεων
- Μειωμένη ανοσοκατασταλτική δράση στον ογκολογικό ασθενή
- Ταχύτερη έναρξη επικουρικής χημειοθεραπείας!!!
    - *25 days (50.1 days [laparoscopic] vs 75.2 days [open], P<.0001)*

Strouch MJ, et al. Dis Colon Rectum 2013

Μειονεκτήματα

- Τεχνικά απαιτητική επέμβαση
- Μακρά καμπύλη εκμάθησης
- Παρατεταμένος χειρουργικός χρόνος
- Κόστος
- Ογκολογική ασφάλεια σε σχέση με ανοικτή TME???

Celentano V, et al. Int J Colorectal Dis 2017
Velazco JC, et al. Ann Surg 2016
Gyung MC, et al. Ann Coloproctol 2019

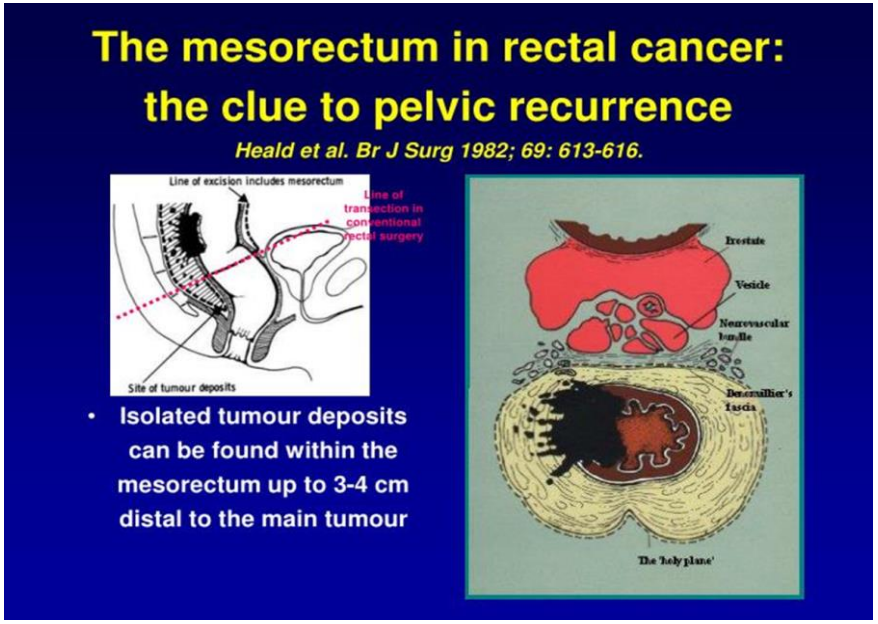
Τεχνικά Μειονεκτήματα

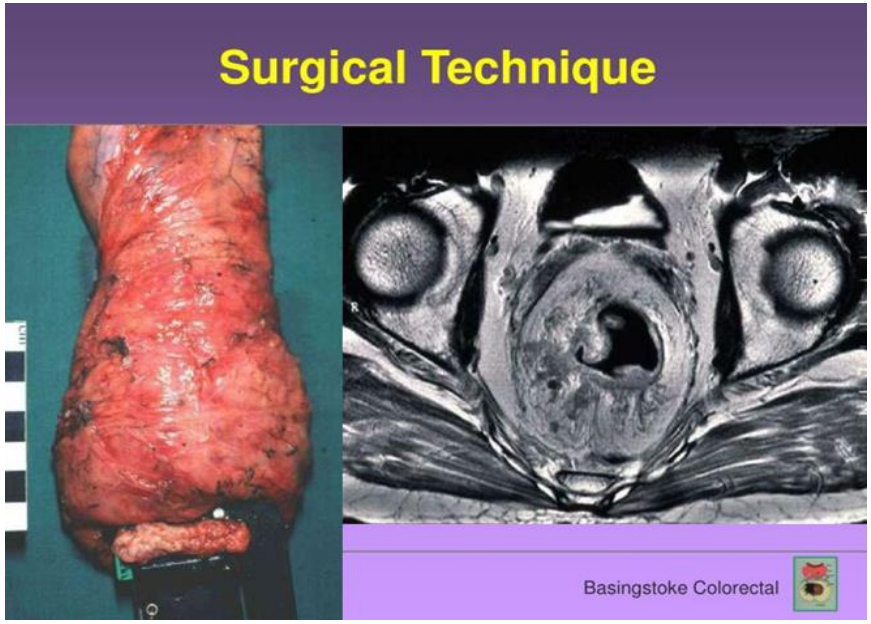
- Συγκέντρωση εργαλείων στη στενή πύελο
- Καπνός που εμποδίζει την όραση
- Δυσχερής χειρισμός του ορθού
- Αδυναμία αναγνώρισης του όγκου
- Τεχνικά δύσκολη διατομή του ορθού
- Άκαμπτα εργαλεία
- Πνευμοπεριτόναιο

Κρίσιμα Σημεία στη Χειρουργική του Ορθού

- TME ως “the gold standard”
- CRM – Περιμετρικό όριο εκτομής >1mm
- Περιφερικό όριο εκτομής (fresh) >1cm
- Επαρκής λεμφαδενεκτομή ≥12 nodes
- ‘MRI-guided’ χρήση της PCRT
- Διαφύλαξη των αυτόνομων νευρικών πλεγμάτων
- Διατήρηση του σφικτηριακού μηχανισμού
- MDTs

Ολική Εκτομή του Μεσοορθού



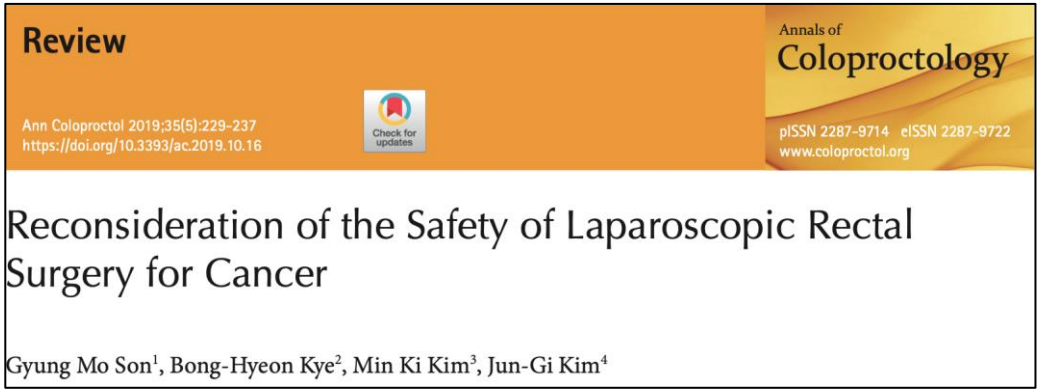


Heald RJ, et al. Br J Surg 1982

Αξιολόγηση Χειρουργικού Παρασκευάσματος

Complete Near-complete Incomplete

Nagtegaal ID, et al. J Clin Oncol 2002
Quirke P, et al. Lancet 1986



Risk - adjusted cumulative sum analysis:

- Change point for conversion — Case 61
- Turning point for postop complications — Case 79
- Operative time / Transfusion volumes stabilizes — Cases 61-75

- Master learning curve for Lap TME — Cases 60-80

Standardized Surgical Technique!!!

Ann Coloproctol 2019

Major RCTs of laparoscopic vs open TME

Study	Type	n	Stages	Preoperative XRT	Location		Endpoint	Conclusion
CLASICC,[9] 2005	RCT	794	Colon and rectum Stage I–IV	Not reported	Not reported		Multiple	"…impaired short-term outcomes after laparoscopic-assisted anterior resection for cancer of the rectum do not yet justify its routine use."
CLASICC,[10] 2012							OS, DFS, LR	"Long-term results continue to support the use of laparoscopic surgery for both colonic and rectal cancer."
COREAN,[12] 2014	RCT noninferiority 15% margin	340	Rectum (0–9 cm) Stage II–III	100%	0–3 cm 3–6 cm 6–9 cm	21% 39% 41%	3-y DFS	"…laparoscopic resection for locally advanced rectal cancer after preoperative chemoradiotherapy provides similar outcomes for disease-free survival as open resection, thus justifying its use."
COLOR II,[13] 2015	RCT noninferiority 5% margin	1044	Rectum (0–15 cm) Stage I–III	59%	0–5 cm 5–10 cm 10–15 cm	29% 39% 32%	3-y LR	"…laparoscopic surgery is as safe and effective as open surgery in patients with rectal cancers without invasion of adjacent tissues."
Z6051,[14] 2015	RCT noninferiority 6% margin	486	Rectum (0–12 cm) Stage II–III	100%	0–5 cm 5–10 cm 10–15 cm	51% 35% 14%	Composite (neg DM, neg CRM, complete or near-complete TME)	"…the findings do not support the use of laparoscopic resection in these patients."
ALaCaRT,[15] 2015	RCT noninferiority 8% margin	475	Rectum (0–15 cm) Stage I–IV	50%	0–5 cm 5–10 cm 10–15 cm	35% 43% 22%	Composite (neg DM, neg CRM, complete TME)	"…these findings do not provide sufficient evidence for the routine use of laparoscopic surgery."

Short-term endpoints of conventional versus laparoscopic-assisted surgery in patients with colorectal cancer (MRC CLASICC trial): multicentre, randomised controlled trial

*Pierre J Guillou, Philip Quirke, Helen Thorpe, Joanne Walker, David G Jayne, Adrian M H Smith, Richard M Heath, Julia M Brown, for the MRC CLASICC trial group**

Lancet 2005

Both colon and rectal CA

No attempt to standardize surgical technique

Rectal CA (50%):
CRM+ Lap 12%
Open 6% (p=0.19)

Conversion rate: 34%!!!

Randomized clinical trial

Five-year follow-up of the Medical Research Council CLASICC trial of laparoscopically assisted *versus* open surgery for colorectal cancer

D. G. Jayne[1], H. C. Thorpe[3], J. Copeland[3], P. Quirke[2], J. M. Brown[3] and P. J. Guillou[1]

Br J Surg 2010

Original article

Long-term follow-up of the Medical Research Council CLASICC trial of conventional *versus* laparoscopically assisted resection in colorectal cancer

B. L. Green[1], H. C. Marshall[1], F. Collinson[1], P. Quirke[2], P. Guillou[3], D. G. Jayne[3] and J. M. Brown[1]

Br J Surg 2013

No difference in OS, DFS, and LR at 3rys and 10yrs follow-up

Open versus laparoscopic surgery for mid-rectal or low-rectal cancer after neoadjuvant chemoradiotherapy (COREAN trial): survival outcomes of an open-label, non-inferiority, randomised controlled trial

Seung-Yong Jeong, Ji Won Park, Byung Ho Nam, Sohee Kim, Sung-Bum Kang, Seok-Byung Lim, Hyo Seong Choi, Duck-Woo Kim, Hee Jin Chang, Dae Yong Kim, Kyung Hae Jung, Tae-You Kim, Gyeong Hoon Kang, Eui Kyu Chie, Sun Young Kim, Dae Kyung Sohn, Dae-Hyun Kim, Jae-Sung Kim, Hye Seung Lee, Jee Hyun Kim, Jae Hwan Oh

RCT non-inferiority 15%
340 pts
3 institutions
Clinical stage II – III
Mid – to – Low (0 – 9cm) form anal verge
All PCRT
Conversion rate 1.2% BMI 24

TME:	92% lap	
	88% open	p=0.41
CRM+	2.9% lap	
	4.1% open	p=0.77

No diff in OS, DFS, and LR

Lancet Oncol 2014

ORIGINAL ARTICLE

A Randomized Trial of Laparoscopic versus Open Surgery for Rectal Cancer

H. Jaap Bonjer, M.D., Ph.D., Charlotte L. Deijen, M.D., Gabor A. Abis, M.D., Miguel A. Cuesta, M.D., Ph.D., Martijn H.G.M. van der Pas, M.D., Elly S.M. de Lange-de Klerk, M.D., Ph.D., Antonio M. Lacy, M.D., Ph.D., Willem A. Bemelman, M.D., Ph.D., John Andersson, M.D., Eva Angenete, M.D., Ph.D., Jacob Rosenberg, M.D., Ph.D., Alois Fuerst, M.D., Ph.D., and Eva Haglind, M.D., Ph.D., for the COLOR II Study Group*

N Engl J Med 2015

Table 2. Involved Circumferential Resection Margin and Locoregional Recurrence.

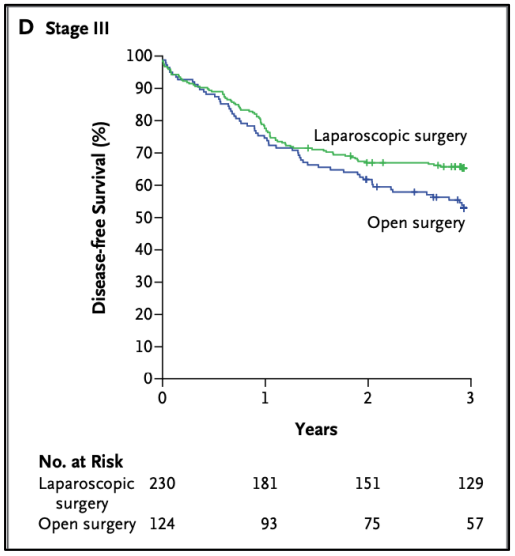
Type of Lesion and Surgery	Involved Circumferential Resection Margin*		Locoregional Recurrence in Intention-to-Treat Population		Locoregional Recurrence in As-Treated Population	
	Patients with Finding†	Between-Group Difference‡	Rate	Between-Group Difference‡	Rate	Between-Group Difference‡
	no./total no. (%)	*percentage points (95% CI)*	%	*percentage points (90% CI)*	%	*percentage points (90% CI)*
All lesions						
Laparoscopic surgery	56/588 (10)	−0.5 (−4.9 to 3.5)	5.0	0.0 (−2.6 to 2.6)	4.3	−2.0 (−4.7 to 0.7)
Open surgery	30/300 (10)		5.0		6.3	
Upper rectal lesion						
Laparoscopic surgery	18/196 (9)	−0.1 (−8.2 to 6.4)	3.5	0.6 (−2.9 to 4.1)	3.0	−0.9 (−4.6 to 2.8)
Open surgery	9/97 (9)		2.9		3.9	
Middle rectal lesion						
Laparoscopic surgery	22/228 (10)	6.2 (0.1 to 11.2)	6.5	4.1 (0.7 to 7.5)	5.7	1.6 (−2.3 to 5.5)
Open surgery	4/115 (3)		2.4		4.1	
Lower rectal lesion						
Laparoscopic surgery	15/164 (9)	−12.4 (−23.2 to −3.0)	4.4	−7.3 (−13.9 to −0.7)	3.8	−8.9 (−15.6 to −2.2)
Open surgery	17/79 (22)		11.7		12.7	

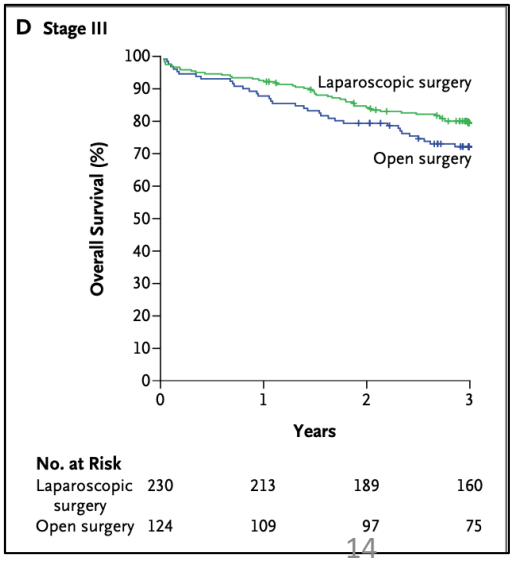
RCT non-inferiority 5%
1044 pts
30 centers in Europe/South Korea
Stage I – III within 15cm from anus

Conversion rate: 16%

33% of lap pStage I
32% 10 -15cm
29% 0 – 5cm
59% only PCRT

No diff in TME, 3yr OS, DFS





Original Investigation

Effect of Laparoscopic-Assisted Resection vs Open Resection of Stage II or III Rectal Cancer on Pathologic Outcomes

The ACOSOG Z6051 Randomized Clinical Trial

James Fleshman, MD; Megan Branda, MS; Daniel J. Sargent, PhD; Anne Marie Boller, MD; Virgilio George, MD; Maher Abbas, MD; Walter R. Peters Jr, MD; Dipen Maun, MD; George Chang, MD; Alan Herline, MD; Alessandro Fichera, MD; Matthew Mutch, MD; Steven Wexner, MD; Mark Whiteford, MD; John Marks, MD; Elisa Birnbaum, MD; David Margolin, MD; David Larson, MD; Peter Marcello, MD; Mitchell Posner, MD; Thomas Read, MD; John Monson, MD; Sherry M. Wren, MD; Peter W. T. Pisters, MD; Heidi Nelson, MD

JAMA 2015

RCT non-inferiority 5%
35 centers in US and Canada
Stage II-III within 12 cm
40 Surgeons with OP report and video
PCRT 100%
More than half in low rectum
Hand-assisted/ robotic: 17% / 14%

Conversion rate: 11.3%
Leak: 2.2%

Composite pathologic endpoint:
a. DM
b. CRM
c. Complete/near complete TME

Table 2. Surgical Success Outcomes

	Laparoscopic Resection (n = 240)	Open Resection (n = 222)	Difference (95% CI)	*P* Value
Composite Outcome, No. (%)				
Total mesorectal excision complete				
CRM ≤1 mm, DM(+)	1 (0.4)	0		
CRM ≤1 mm, DM(−)	16 (6.7)	14 (6.3)		
CRM >1 mm, DM(+)	2 (0.8)	3 (1.4)		
CRM >1 mm, DM(−)	156 (65.0)	164 (73.9)		
Total mesorectal excision nearly complete				
CRM ≤1 mm, DM(+)	0	1 (0.5)		
CRM ≤1 mm, DM(−)	6 (2.5)	0		
CRM >1 mm, DM(−)	40 (16.7)	29 (13.1)		
Total mesorectal excision incomplete				
CRM ≤1 mm, DM(−)	6 (2.5)	2 (0.9)		
CRM >1 mm, DM(+)	1 (0.4)	0		
CRM >1 mm, DM(−)	12 (5.0)	9 (4.1)		
Percentage (95% CI)[a]				
CRM >1 mm or distance = NA	87.9 (83.8 to 92.0)	92.3 (88.8 to 95.8)	−4.4 (−9.8 to 0.98)	.11[b]
Distal margin negative	98.3 (96.7 to 99.95)	98.2 (96.5 to 99.95)	−0.1 (−2.3 to 2.5)	.91[b]
Complete or nearly complete total mesorectal excision	92.1 (88.7 to 95.5)	95.1 (92.2 to 97.9)	−3.0 (−7.4 to 1.5)	.20[b]
Successful resection[d]				
Modified intent to treat	81.7 (76.8 to 86.6)	86.9 (82.5 to 91.4)	−5.3 (−10.8 to ∞)[c]	.41
Per protocol[e]	81.7 (76.5 to 86.9)	86.9 (82.5 to 91.4)	−5.3 (−11.0 to ∞)[c]	.41

Original Investigation

Effect of Laparoscopic-Assisted Resection vs Open Resection on Pathological Outcomes in Rectal Cancer

The ALaCaRT Randomized Clinical Trial

Andrew R. L. Stevenson, MB BS, FRACS; Michael J. Solomon, MB BCh, MSc, FRCSI, FRACS; John W. Lumley, MBBS, FRACS; Peter Hewett, MB BS, FRACS; Andrew D. Clouston, MB BS, PhD, FRCPA; Val J. Gebski, MStat; Lucy Davies, MSc; Kate Wilson, BA, MPH; Wendy Hague, MB BS, PhD, MBA; John Simes, BSc (Med), MB BS, SM, FRACP, MD; for the ALaCaRT Investigators

JAMA 2015

RCT non-inferiority 8%
24 centers in Australia/New Zealand
26 accredited surgeons
Stage I-IV within 15cm
35% of tumors 0-5cm from anus
Only 50% had PCRT

Conversion rate: 9%

Composite pathologic endpoint:
a. DM
b. CRM
c. Complete TME

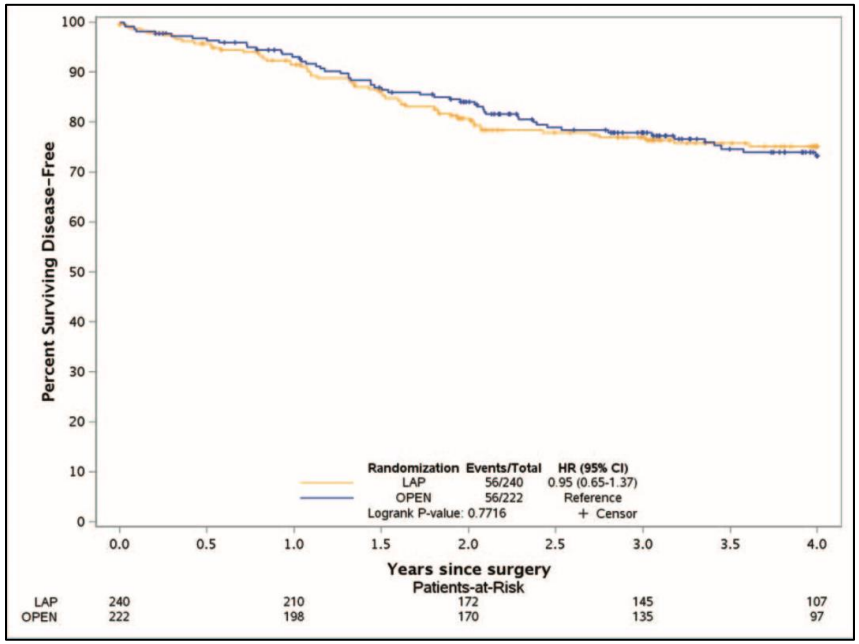
Table 2. Pathological Assessment of Patients in the ALaCaRT Trial

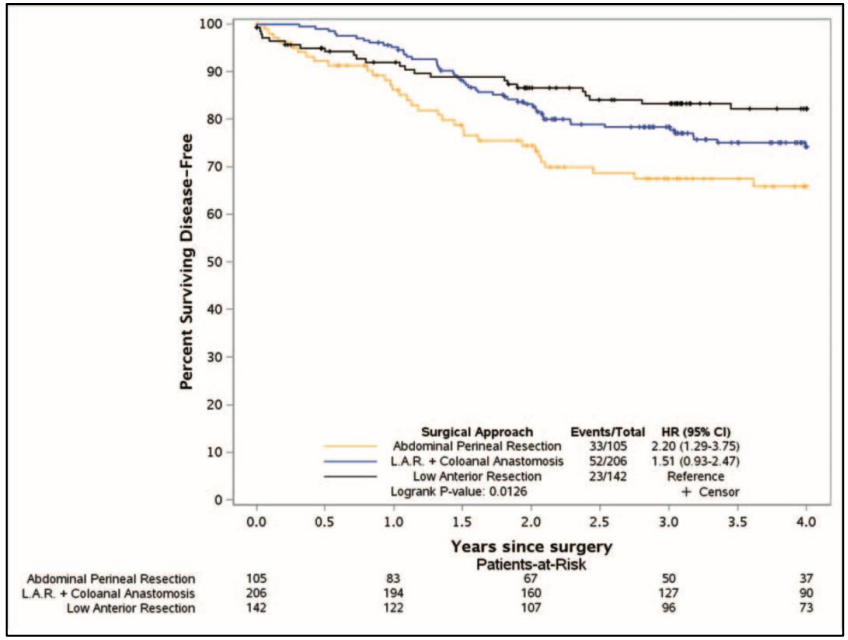
	Laparoscopic Rectal Resection (n = 238)	Open Laparotomy and Rectal Resection (n = 235)	Risk Difference, % (95% CI)	*P* Value
Primary Outcome				
No. (%) with negative circumferential and distal margins and complete total mesorectal excision	194 (82)	208 (89)	−7.0 (−12.4 to ∞)	.38[a]
Primary Outcome Components				
Circumferential resection margin, median (IQR), mm	10 (6-20)[b]	12 (6-20)[c]		.43[d]
No. (%) with negative margin (≥1 mm)	222 (93)	228 (97)	−3.7 (−7.6 to 0.1)	.06
Distal resection margin, median (IQR), mm	26 (15-45)[b]	30 (16-40)[c]		.50[d]
No. (%) with negative margin (≥1 mm)	236 (99)	234 (99)	−0.4 (−1.8 to 1.0)	.67
Total mesorectal excision, No. (%)				
Complete	206 (87)	216 (92)	−5.4 (−10.9 to 0.2)	
Nearly complete	24 (10)	17 (7)	2.8 (−2.2 to 7.9)	.06
Incomplete	8 (3)	2 (1)	2.5 (−0.06 to 5.1)	

Disease-free Survival and Local Recurrence for Laparoscopic Resection Compared With Open Resection of Stage II to III Rectal Cancer

Follow-up Results of the ACOSOG Z6051 Randomized Controlled Trial

Ann Surg 2019





"Factors that negatively impact DFS after resection of rectal cancer include operation (APR), low position of the tumor, rectal perforation during the resection, and unsuccessful operation based on circumferential radial margin positivity."

Disease-free Survival and Local Recurrence After Laparoscopic-assisted Resection or Open Resection for Rectal Cancer

The Australasian Laparoscopic Cancer of the Rectum Randomized Clinical Trial

Ann Surg 2019

TABLE 2. Summary Outcomes: Events During Follow-up and Difference in Disease-free Survival and Overall Survival Actuarial Rates at 2 years

Characteristic	Laparoscopic Surgery (n = 225)	Open Surgery (n = 225)	Difference at 2 yrs	95% CI for Difference
Follow-up (IQR), yrs	3.2 (3.0–4.1)	3.3 (3.0–4.2)		
Recurrences	53 (24)	42 (19)	−2.0%*	−9.3% to 5.4%
Locoregional	15	9		
Distant	44	39		
Deaths	27 (12)	26 (12)	0.9%	−3.6% to 5.4%
Rectal cancer	18	14		
Treatment	1	0		
Other	8	12		

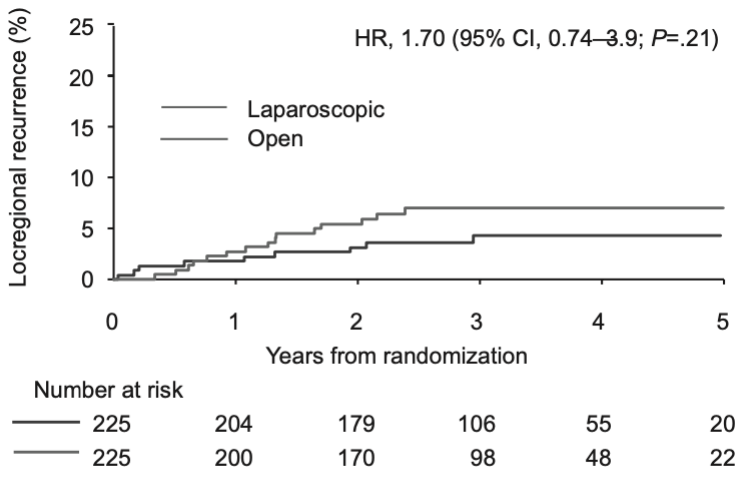


FIGURE 2. Cumulative incidence of locoregional recurrence by surgical group.

"… caution is still needed in recommending laparo- scopic procedures and, laparo- scopic resection could not be advocated as routine standard treatment…"

Laparoscopy for rectal cancer is oncologically adequate: a systematic review and meta-analysis of the literature

Alberto Arezzo · Roberto Passera · Alessandro Salvai · Simone Arolfo · Marco Ettore Allaix · Guido Schwarzer · Mario Morino

8 RCTs – 19 Non RCTs
2000 – 2013
10861 pts

No significant difference in:

a. TME
b. CRM
c. DM
d. LNs
e. DFS
f. 5-year Local Recurrence rate

Surg Endosc 2015

Pathologic Outcomes of Laparoscopic vs Open Mesorectal Excision for Rectal Cancer
A Systematic Review and Meta-analysis

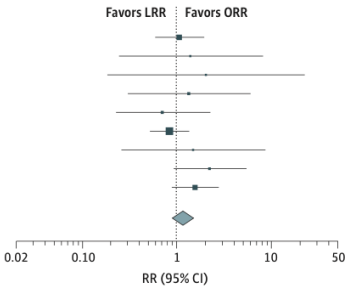
Aleix Martínez-Pérez, MD; Maria Clotilde Carra, PhD; Francesco Brunetti, MD; Nicola de'Angelis, MD, PhD

Figure 2. Forest Plots of the Primary Outcomes

A Circumferential resection margin involvement

Source	LRR No. of Events	LRR Participants	ORR No. of Events	ORR Participants	RR (95% CI)
Guillou et al,[15] 2005	30	193	14	97	1.08 (0.60-1.93)
Ng et al,[35] 2008	3	51	2	48	1.41 (0.25-8.09)
Ng et al,[33] 2009	2	76	1	77	2.03 (0.19-21.88)
Luján et al,[34] 2009	4	101	3	103	1.36 (0.31-5.92)
Kang et al,[14] 2010	5	170	7	170	0.71 (0.23-2.21)
van der Pas et al,[13] 2013	43	588	26	300	0.84 (0.53-1.35)
Ng et al,[30] 2014	3	40	2	40	1.50 (0.26-8.50)
Stevenson et al,[21] 2015	16	238	7	235	2.26 (0.95-5.39)
Fleshman et al,[20] 2015	29	240	17	222	1.58 (0.89-2.79)
Total	**135**	**1697**	**79**	**1292**	**1.17 (0.89-1.53)**

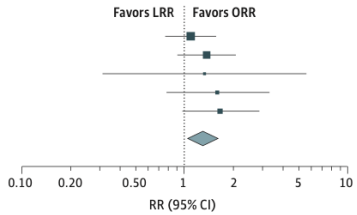
Heterogeneity $\tau^2 = 0.00$, $\chi^2_8 = 6.32$ ($P = .61$), $I^2 = 0\%$
Test for overall effect: $Z = 1.13$ ($P = .26$)



B Noncomplete mesorectal excision

Source	LRR No. of Events	LRR Participants	ORR No. of Events	ORR Participants	RR (95% CI)
Kang et al,[14] 2010	47	170	43	170	1.09 (0.77-1.56)
van der Pas et al,[13] 2013	77	666	28	331	1.37 (0.91-2.06)
Ng et al,[30] 2014	4	40	3	40	1.33 (0.32-5.58)
Fleshman et al,[20] 2015	19	240	11	222	1.60 (0.78-3.28)
Stevenson et al,[21] 2015	32	238	19	235	1.66 (0.97-2.85)
Total	**179**	**1354**	**104**	**998**	**1.31 (1.05-1.64)**

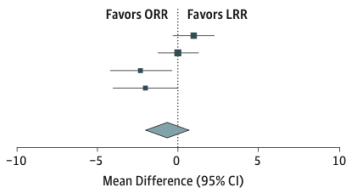
Heterogeneity $\tau^2 = 0.00$, $\chi^2_5 = 2.11$ ($P = .71$), $I^2 = 0\%$
Test for overall effect: $Z = 2.36$ ($P = .02$)



B Distance to radial margin

Source	Distance, mm LRR Mean	LRR (SD)	LRR Total	ORR Mean	ORR (SD)	ORR Total	Mean Difference (95% CI)
Kang et al,[14] 2010	9	(5.92)	170	8	(5.92)	170	1.00 (−0.26 to 2.26)
van der Pas et al,[13] 2013	10	(9.62)	588	10	(8.14)	300	0.00 (−1.21 to 1.21)
Fleshman et al,[20] 2015	10.5	(9.2)	240	12.8	(11.2)	222	−2.30 (−4.18 to −0.42)
Stevenson et al,[21] 2015	10	(10.37)	211	12	(10.37)	201	−2.00 (−4.00 to 0.00)
Total			**1209**			**893**	**−0.67 (−2.16 to 0.83)**

Heterogeneity $\tau^2 = 1.69$, $\chi^2_3 = 11.46$ ($P = .009$), $I^2 = 74\%$
Test for overall effect: $Z = 0.87$ ($P = .38$)



Key Points

Question What are the pathologic outcomes of laparoscopic rectal resection compared with open rectal resection for rectal cancer?

Finding Based on this systematic review and meta-analysis of 14 randomized clinical trials, the risk of achieving a noncomplete (incomplete or nearly complete) mesorectal excision is significantly higher in patients undergoing laparoscopic compared with open rectal resections.

Meaning These pathologic findings challenge the oncologic safety of laparoscopy for the treatment of rectal cancer.

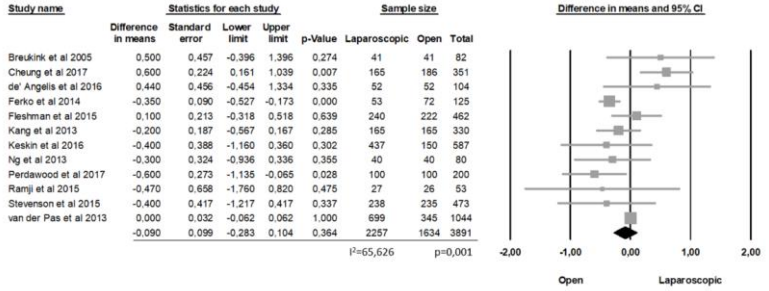
Noncomplete (incomp/nearcomp) TME

lap	13.2%	
open	10.4%	p=0.02

JAMA 2017

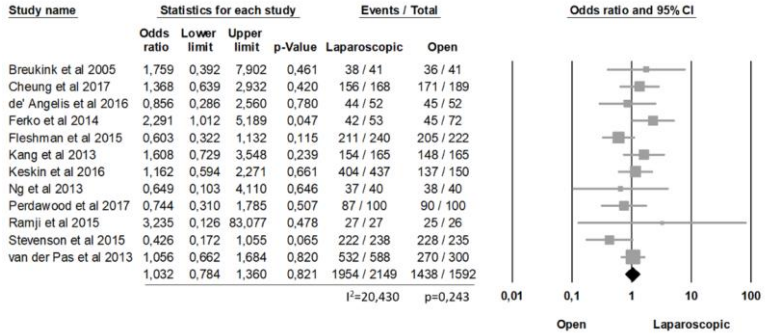
Surgical resection for rectal cancer. Is laparoscopic surgery as successful as open approach? A systematic review with meta-analysis

Marco Milone[1]*, Michele Manigrasso[1], Morena Burati[1], Nunzio Velotti[1], Francesco Milone[1], Giovanni Domenico De Palma[2]



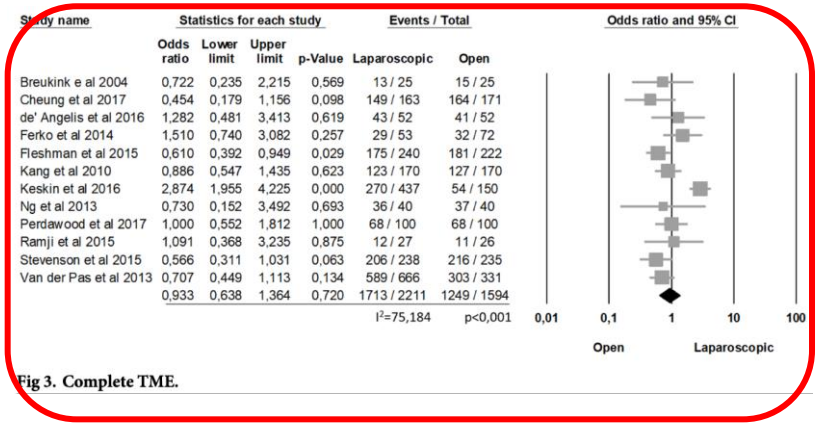
Study name	Difference in means	Standard error	Lower limit	Upper limit	p-Value	Laparoscopic	Open	Total
Breukink et al 2005	0,500	0,457	-0,396	1,396	0,274	41	41	82
Cheung et al 2017	0,600	0,224	0,161	1,039	0,007	165	186	351
de' Angelis et al 2016	0,440	0,456	-0,454	1,334	0,335	52	52	104
Ferko et al 2014	-0,350	0,090	-0,527	-0,173	0,000	53	72	125
Fleshman et al 2015	0,100	0,213	-0,318	0,518	0,639	240	222	462
Kang et al 2013	-0,200	0,187	-0,567	0,167	0,285	165	165	330
Keskin et al 2016	-0,400	0,388	-1,160	0,360	0,302	437	150	587
Ng et al 2013	-0,300	0,324	-0,936	0,336	0,355	40	40	80
Perdawood et al 2017	-0,600	0,273	-1,135	-0,065	0,028	100	100	200
Ramji et al 2015	-0,470	0,658	-1,760	0,820	0,475	27	26	53
Stevenson et al 2015	-0,400	0,417	-1,217	0,417	0,337	238	235	473
van der Pas et al 2013	0,000	0,032	-0,062	0,062	1,000	699	345	1044
	-0,090	0,099	-0,283	0,104	0,364	2257	1634	3891

Fig 1. Distance from distal margin of the specimen (DRM).



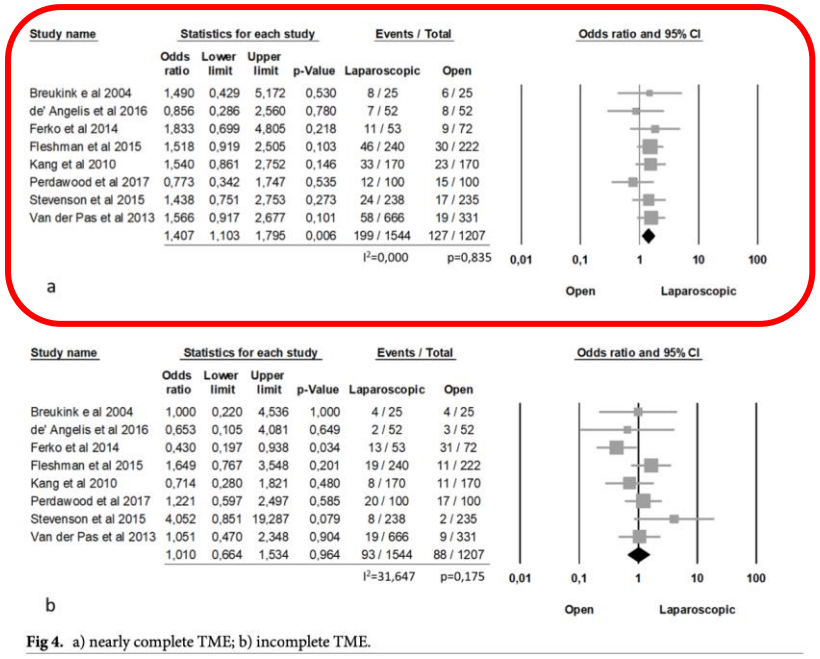
Study name	Odds ratio	Lower limit	Upper limit	p-Value	Laparoscopic	Open
Breukink et al 2005	1,759	0,392	7,902	0,461	38 / 41	36 / 41
Cheung et al 2017	1,368	0,639	2,932	0,420	156 / 168	171 / 189
de' Angelis et al 2016	0,856	0,286	2,560	0,780	44 / 52	45 / 52
Ferko et al 2014	2,291	1,012	5,189	0,047	42 / 53	45 / 72
Fleshman et al 2015	0,603	0,322	1,132	0,115	211 / 240	205 / 222
Kang et al 2013	1,608	0,729	3,548	0,239	154 / 165	148 / 165
Keskin et al 2016	1,162	0,594	2,271	0,661	404 / 437	137 / 150
Ng et al 2013	0,649	0,103	4,110	0,646	37 / 40	38 / 40
Perdawood et al 2017	0,744	0,310	1,785	0,507	87 / 100	90 / 100
Ramji et al 2015	3,235	0,126	83,077	0,478	27 / 27	25 / 26
Stevenson et al 2015	0,426	0,172	1,055	0,065	222 / 238	228 / 235
van der Pas et al 2013	1,056	0,662	1,684	0,820	532 / 588	270 / 300
	1,032	0,784	1,360	0,821	1954 / 2149	1438 / 1592

Fig 2. Clear CRM.



Study name	Odds ratio	Lower limit	Upper limit	p-Value	Laparoscopic	Open
Breukink e al 2004	0,722	0,235	2,215	0,569	13 / 25	15 / 25
Cheung et al 2017	0,454	0,179	1,156	0,098	149 / 163	164 / 171
de' Angelis et al 2016	1,282	0,481	3,413	0,619	43 / 52	41 / 52
Ferko et al 2014	1,510	0,740	3,082	0,257	29 / 53	32 / 72
Fleshman et al 2015	0,610	0,392	0,949	0,029	175 / 240	181 / 222
Kang et al 2010	0,886	0,547	1,435	0,623	123 / 170	127 / 170
Keskin et al 2016	2,874	1,955	4,225	0,000	270 / 437	54 / 150
Ng et al 2013	0,730	0,152	3,492	0,693	36 / 40	37 / 40
Perdawood et al 2017	1,000	0,552	1,812	1,000	68 / 100	68 / 100
Ramji et al 2015	1,091	0,368	3,235	0,875	12 / 27	11 / 26
Stevenson et al 2015	0,566	0,311	1,031	0,063	206 / 238	216 / 235
Van der Pas et al 2013	0,707	0,449	1,113	0,134	589 / 666	303 / 331
	0,933	0,638	1,364	0,720	1713 / 2211	1249 / 1594

Fig 3. Complete TME.



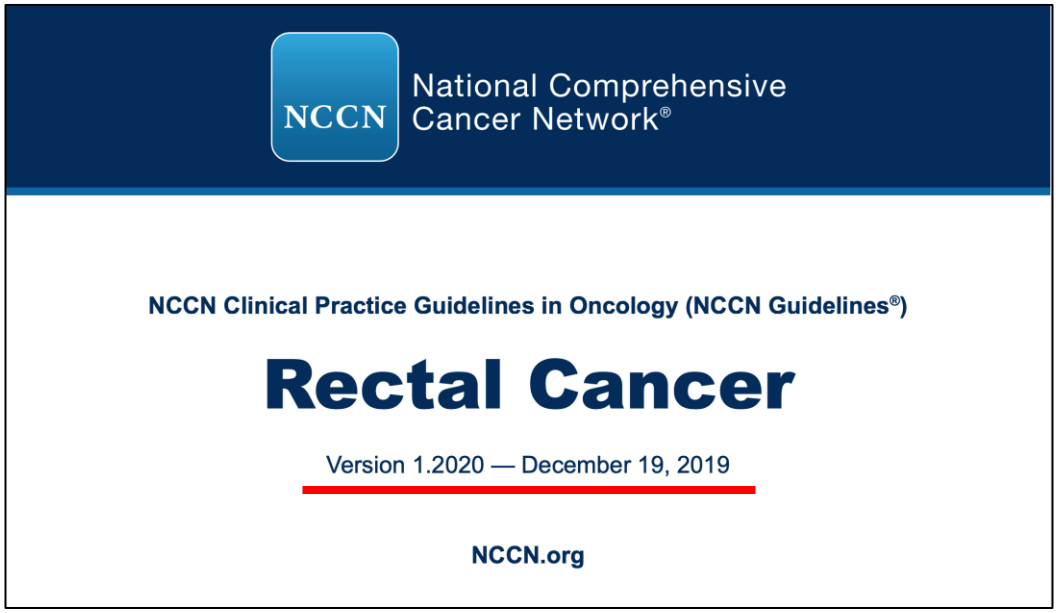
Study name	Odds ratio	Lower limit	Upper limit	p-Value	Laparoscopic	Open
Breukink e al 2004	1,490	0,429	5,172	0,530	8 / 25	6 / 25
de' Angelis et al 2016	0,856	0,286	2,560	0,780	7 / 52	8 / 52
Ferko et al 2014	1,833	0,699	4,805	0,218	11 / 53	9 / 72
Fleshman et al 2015	1,518	0,919	2,505	0,103	46 / 240	30 / 222
Kang et al 2010	1,540	0,861	2,752	0,146	33 / 170	23 / 170
Perdawood et al 2017	0,773	0,342	1,747	0,535	12 / 100	15 / 100
Stevenson et al 2015	1,438	0,751	2,753	0,273	24 / 238	17 / 235
Van der Pas et al 2013	1,566	0,917	2,677	0,101	58 / 666	19 / 331
	1,407	1,103	1,795	0,006	199 / 1544	127 / 1207

Study name	Odds ratio	Lower limit	Upper limit	p-Value	Laparoscopic	Open
Breukink e al 2004	1,000	0,220	4,536	1,000	4 / 25	4 / 25
de' Angelis et al 2016	0,653	0,105	4,081	0,649	2 / 52	3 / 52
Ferko et al 2014	0,430	0,197	0,938	0,034	13 / 53	31 / 72
Fleshman et al 2015	1,649	0,767	3,548	0,201	19 / 240	11 / 222
Kang et al 2010	0,714	0,280	1,821	0,480	8 / 170	11 / 170
Perdawood et al 2017	1,221	0,597	2,497	0,585	20 / 100	17 / 100
Stevenson et al 2015	4,052	0,851	19,287	0,079	8 / 238	2 / 235
Van der Pas et al 2013	1,051	0,470	2,348	0,904	19 / 666	9 / 331
	1,010	0,664	1,534	0,964	93 / 1544	88 / 1207

Fig 4. a) nearly complete TME; b) incomplete TME.

"…mesorectal shearing caused by traction with rigid instruments in the narrow pelvic cavity during laparoscopic TME…"

PLoS One 2018



- **Some studies have shown that laparoscopy is associated with similar short- and long-term outcomes when compared to open surgery,[3] whereas other studies have shown that laparoscopy is associated with higher rates of circumferential margin positivity and incomplete TME.[4,5] Therefore, minimally invasive resection may be considered based on the following principles:**
  - ◊ **The surgeon should have experience performing minimally invasive proctectomy with TME.**
  - ◊ **It is not indicated for locally advanced disease with a threatened or high-risk circumferential margin based on staging. For these high-risk tumors, open surgery is preferred.**
  - ◊ **It is not generally indicated for acute bowel obstruction or perforation from cancer.**
  - ◊ **Thorough abdominal exploration is required.**

Συμπεράσματα

- Lap TME μπορεί να γίνει με ασφάλεια
- Χειρουργική εμπειρία και εξειδίκευση
- Τυποποιημένη τεχνική
- Καλύτερα βραχυπρόθεσμα αποτελέσματα
- Ικανοποιητική έκβαση σε όγκους άνω/μέσου 3μορίου
- CA κάτω 3μορίου???
- Μακροπρόθεσμες Επιβιώσεις…
- Μετα – Αναλύσεις…
- Εξατομικευμένη προσέγγιση!