

Ρομποτική προσπάθεια : Πλεονεκτήματα & μειονεκτήματα έναντι της λαπαροσκοπικής

Μ.Γ. Πραματευτάκης MD PhD FICS MSCS
Επίκουρος Καθηγητής Χειρουργικής ΑΠΘ
Εξειδ. Χειρουργός Παθήσεων Παχέος
Εντέρου/Πρωκτού - SRC-Cert.

1^ο Πανελλήνιο
Συνέδριο



ΣΤΡΟΓΓΥΛΗ ΤΡΑΠΕΖΑ

ΤΑ ΑΠΟΤΕΛΕΣΜΑΤΑ ΤΗΣ ΝΕΑΣ ΦΙΛΟΣΟΦΙΑΣ ΚΑΙ ΤΩΝ ΤΕΧΝΟΛΟΓΙΚΩΝ
ΚΑΙΝΟΤΟΜΙΩΝ ΣΤΗ ΧΕΙΡΟΥΡΓΙΚΗ ΑΝΤΙΜΕΤΩΠΙΣΗ ΤΟΥ ΟΡΘΟΚΟΛΙΚΟΥ
ΚΑΡΚΙΝΟΥ

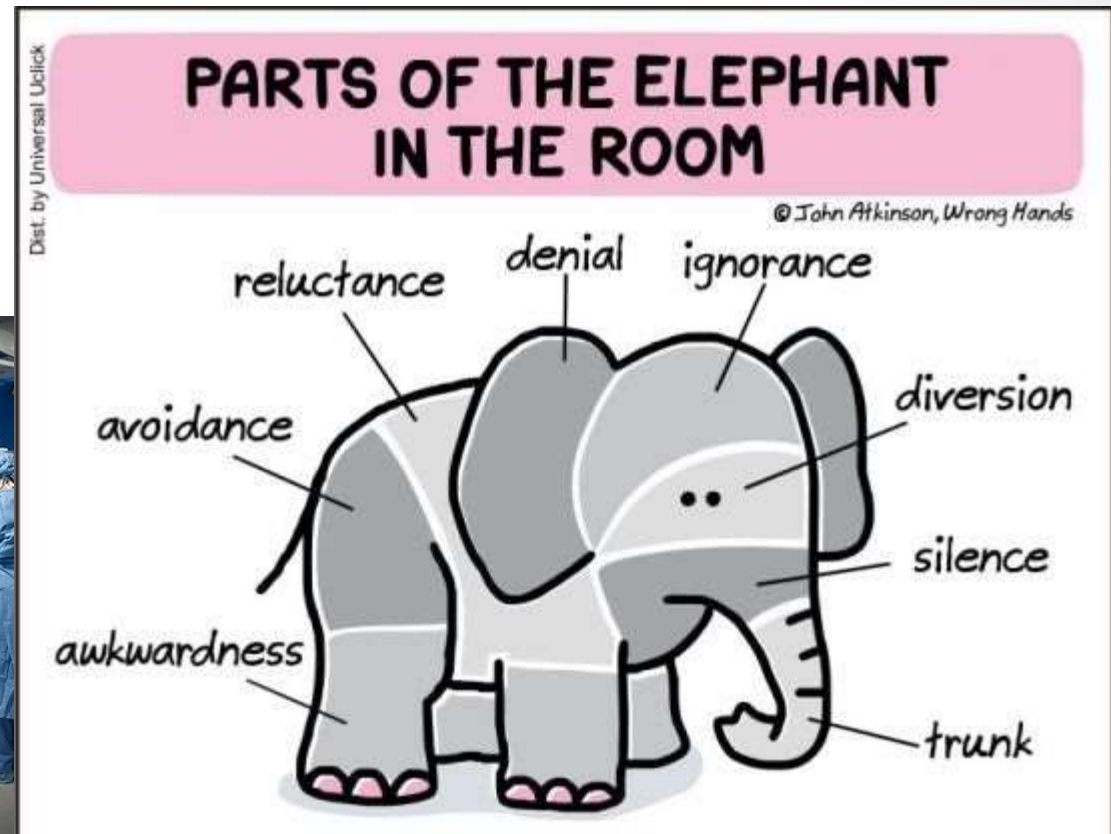
Προεδρείο: Ι. Παρασκευόπουλος, Ν. Σικαλιάς

Καμία σύγκρουση συμφερόντων

SRC - Medtronic

Ρομποτική Χειρουργική

- Κόστος;;;
- Ανάγκη;;;
- Marketing;;;
- Διαφήμιση;; (GR)



Facts

RTME vs LTME*

1 Randomized Control Trial

27 συγκριτικές μελέτες

5547 ασθενείς

*Έως Δεκέμβριο 2018

PubMed

robot general surgery



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[Robotics in general surgery: an evidence-based review.](#)

1.

Baek SJ, Kim SH.

Asian J Endosc Surg. 2014 May;7(2):117-23. Review.

PMID: 24877247

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Αύξηση κλινικών στοιχείων / αποτελεσμάτων

ORIGINAL CONTRIBUTION

DISEASES OF THE COLON & RECTUM VOLUME 54: 2 (2011)

Robotic vs Laparoscopic Resection of Rectal Cancer: Short-Term Outcomes of a Case-Control Study

Jung Myun Kwak, M.D. • Seon Hahn Kim, M.D. • Jin Kim, M.D.

Jaek, M.D. • Jae Sung Cho, M.D.

Surg Endosc (2010) 24:2888–2894
DOI 10.1007/s00464-010-1134-7

Robotic versus laparoscopic total mesorectal excision for rectal cancer: a comparative analysis of oncological safety and short-term outcomes

Surg Endosc (2011) 25:521–525
DOI 10.1007/s00464-010-1204-x

P. P. Bianchi • C. Ceriani • A. Locatelli •
G. Spinoglio • M. G. Zampino • A. Sonzogni •
C. Crosta • B. Andreoni

Robotic and laparoscopic total mesorectal excision for rectal cancer: a case-matched study

Jeong-Heum Baek • Carlos Pastor •
Alessio Pigazzi

Int J Med Robot. 2014 Sep;10(3):300-5. doi: 10.1002/rcs.1583. Epub 2014 Apr 1.

Robotic versus laparoscopic rectal resection: is there any real difference? A comparative single center study.

Ielpo B¹, Caruso R, Quijano Y, Duran H, Diaz E, Fabra I, Oliva C, Olivares S, Ferri V, Ceron R, Plaza C, Vicente E.

Author information

¹Sanchinarro University Hospital, General Surgery Department, San Pablo University, CEU, Madrid, Spain.

Διαρκής Αύξηση Κλινικών Στοιχείων

META-ANALYSIS

[Ann Surg.](#) 2017 Oct 3.

Robotic Versus Laparoscopic Minimally Invasive Surgery for Rectal Cancer

A Systematic Review and Meta-analysis of Randomized Controlled Trials

Francesco Paolo Prete, MD, MSc, PhD,*† Angela Pezzolla, MD,* Fernando Prete, MD,‡
Mario Testini, MD,§ Rinaldo Marzaioli, MD,* Alberto Patrì, MD,¶ Rosa Maria Jimenez-Rodriguez, MD, PhD,||
Angela Gurrado, MD, PhD,§ and Giovanni F. M. Strippoli, MD, PhD, MPH, MM†**††

1. Baik 2008
2. Jimenez-Rodriguez 2011
3. Patrì 2009
4. ROLARR 2017
5. Wang 2017

Conclusion: Evidence of moderate quality supports that robotic surgery for rectal cancer produces similar perioperative outcomes of oncologic procedure adequacy to conventional laparoscopic surgery. Robotic surgery portrays lower rate of conversion to open surgery, while operating time is significantly longer than by laparoscopic approach.

Now Available: [Final Rule for FDAAA 801 and NIH Policy on Clinical Trial Reporting](#)

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RObotic Versus LAParoscopic Resection for Rectal Cancer (ROLARR)

This study is ongoing, but not recruiting participants.

Sponsor:

University of California, Irvine

Collaborator:

University of Leeds

Information provided by (Responsible Party):

Alessio Pigazzi, University of California, Irvine

ClinicalTrials.gov Identifier:

NCT01736072

First received: November 15, 2012

Last updated: November 30, 2015

Last verified: November 2015

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No Study Results Posted

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No Study Results Posted on ClinicalTrials.gov for this Study

[About Study Results Reporting on ClinicalTrials.gov](#)

Study Status:	This study is ongoing, but not recruiting participants.
Estimated Study Completion Date:	June 2018
Estimated Primary Completion Date:	December 2017 (Final data collection date for primary outcome measure)

Now Available: Final Rule for FDAAA 801 and NIH Policy on Clinical Trial Reporting

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RObotic Versus LAParoscopic Resection for Rectal Cancer (ROLARR)

471 randomized patients

Conversion

Lap: 12.2%

Rob: 8.1%

$P=0.16$

CRM+

Lap: 6.3%

Rob: 5.1%

$P=0.56$

Costs

Rob +1132 dol

$P> 0.05$

Op times:

Rob +35 min

$P> 0.05$



A. 2017;318(16):1569-1580

cores

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cores

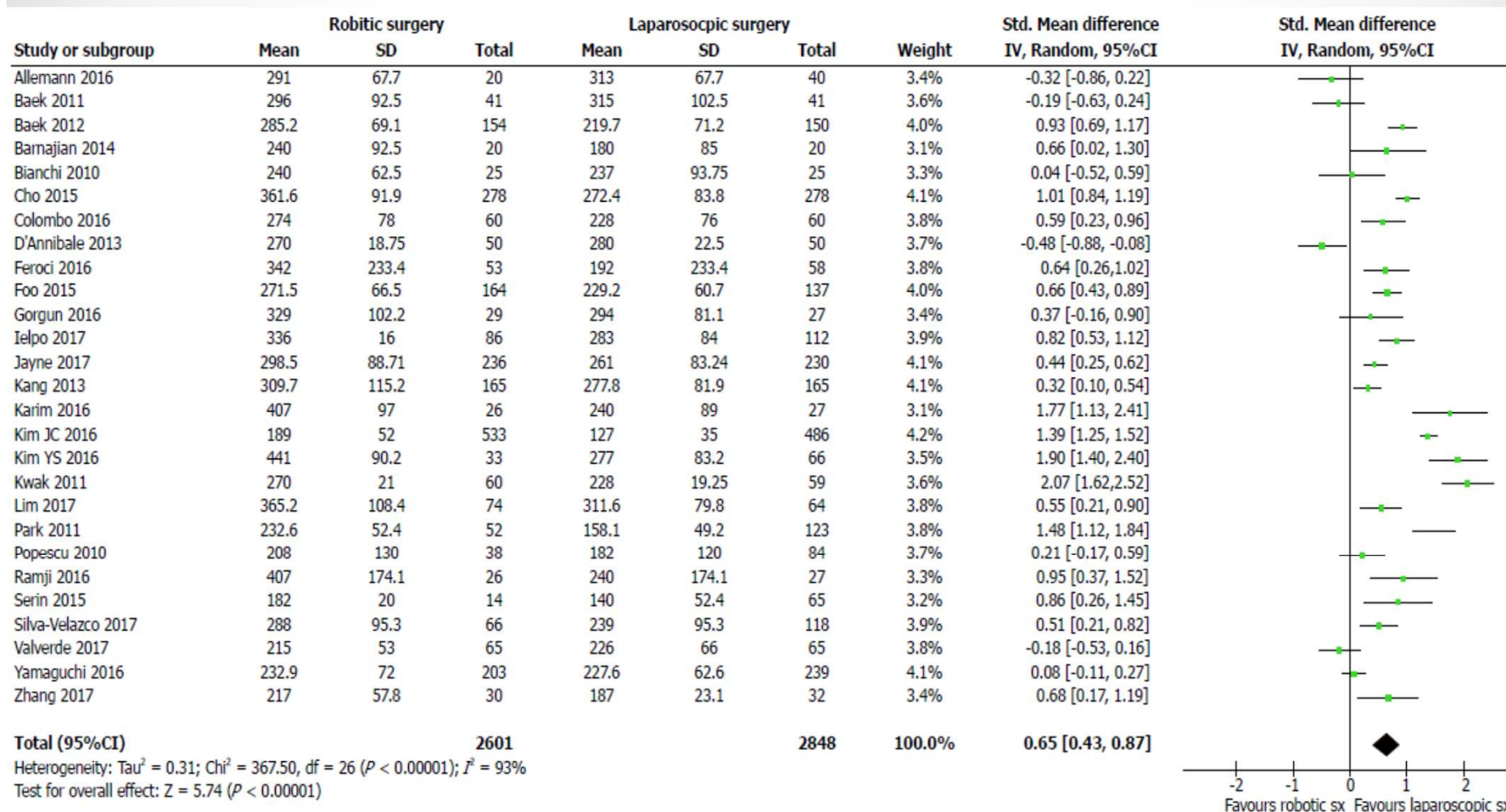
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Robotic total meso-rectal excision for rectal cancer: A systematic review following the publication of the ROLARR trial

Katie Jones, Mohamed G Qassem, Parv Sains, Mirza K Baig, Muhammad S Sajid



Forest plot for duration of operation following rectal resection by robotic surgery vs conventional laparoscopic surgery.

Robotic total meso-rectal excision for rectal cancer: A systematic review following the publication of the ROLARR trial

Katie Jones, Mohamed G Qassem, Parv Sains, Mirza K Baig, Muhammad S Sajid

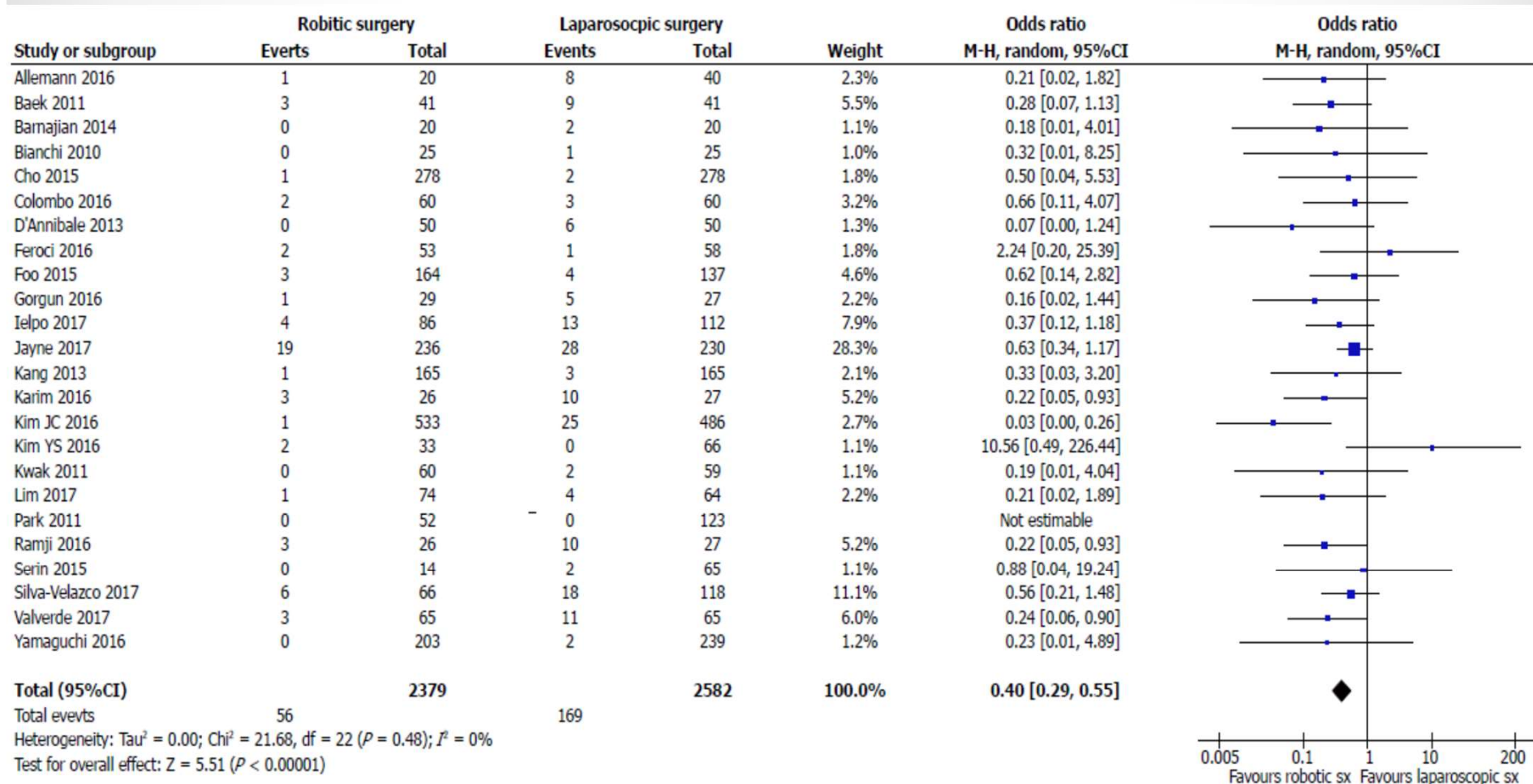


Figure 3 Forest plot for conversion following rectal resection by robotic surgery vs conventional laparoscopic surgery. Odds ratio is shown with 95% CIs.

Robotic total meso-rectal excision for rectal cancer: A systematic review following the publication of the ROLARR trial

Katie Jones, Mohamed G Qassem, Parv Sains, Mirza K Baig, Muhammad S Sajid

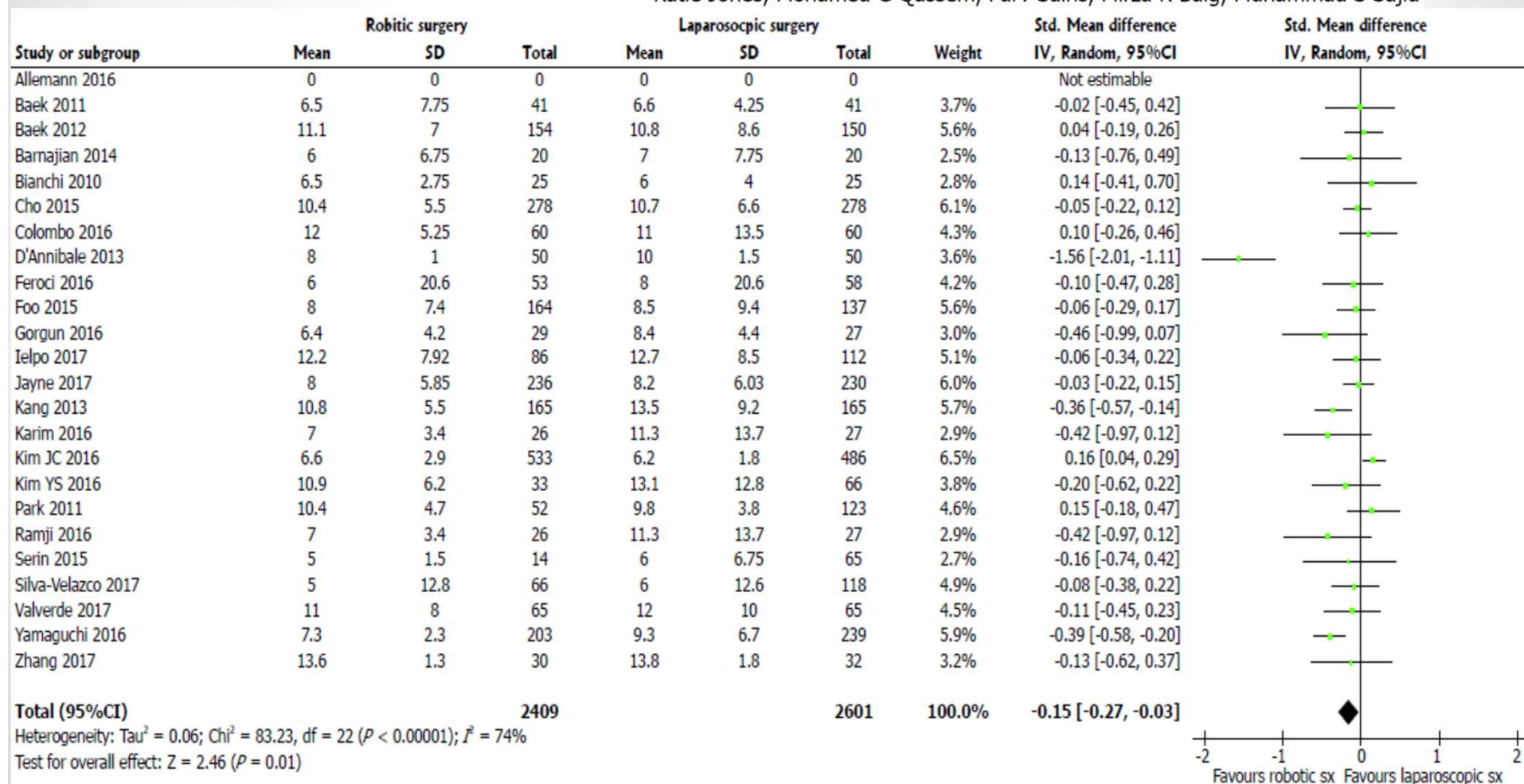


Figure 5 Forest plot for duration of hospital stay following rectal resection by robotic surgery vs conventional laparoscopic surgery. Standardized mean difference is shown with 95% CIs.

World J Gastrointest Oncol 2018 November 15; 10(11): 449-464

Robotic total meso-rectal excision for rectal cancer: A systematic review following the publication of the ROLARR trial

Katie Jones, Mohamed G Qassem, Parv Sains, Mirza K Baig, Muhammad S Sajid

Σημαντική διαφορά

Ανάγκη μετατροπής σε ανοικτό
Παραμονή στο νοσοκομείο
Κινητικότητα εντέρου

Μη σημαντική διαφορά

Θετικό CRM
Όρια εκτομής
Αριθμός λεμφαδένων
Κίνδυνος υποτροπής

Πλεονεκτήματα

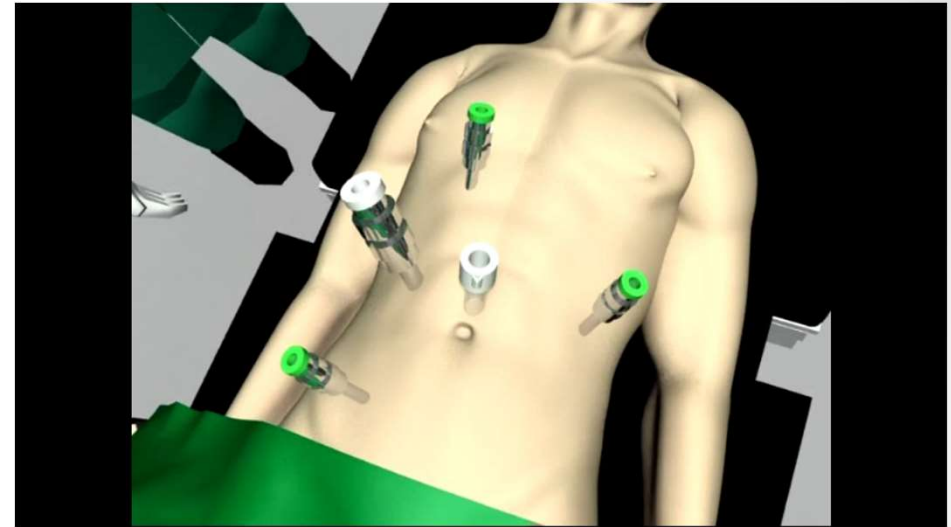


- **4 χέρια**

- ο Ιδανική οπτική εικόνα
- ο Σταθερή τάση και αντίσταση
- ο Αρθρώσεις μεγάλων γωνιών
- ο Η παρασκευή απολύτως στα χέρια του χειρουργού



Πλεονεκτήματα

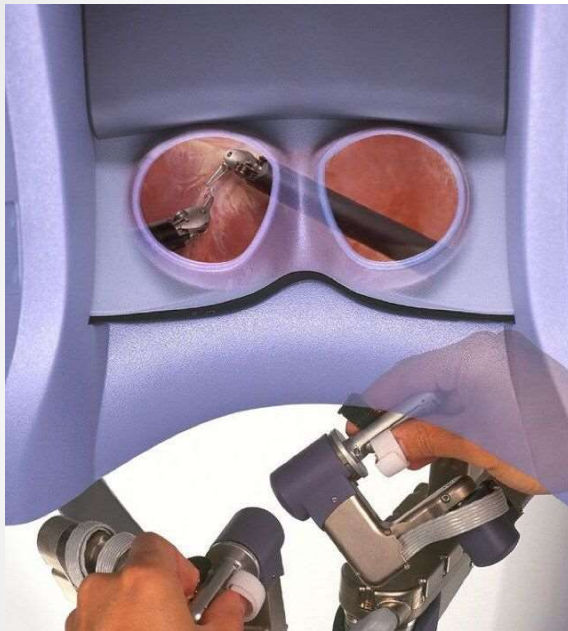


Comfort / Ευκολία



Πλεονεκτήματα

3D Vision



Surgical team parameters	Mean Score after 2D group	Mean Score after 3D group	p-value
Variables of surgical outcome ^a			
- Precision	3.2 (range 2–4)	4.6 (range 3–5)	<.05
- Definition of planes	3.0 (range 2–4)	4.8 (range 4–5)	<.05
- Depth perception	2.5 (range 1–4)	4.8 (range 4–5)	<.05
Residents and medical students			
Variables of surgical outcome ^a			
- Precision	2.3 (range 2–4)	4.8 (range 4–5)	<.05
- Definition of planes	2.1 (range 2–3)	4.7 (range 4–5)	<.05
- Depth perception	1.8 (range 2–4)	4.8 (range 4–5)	<.05

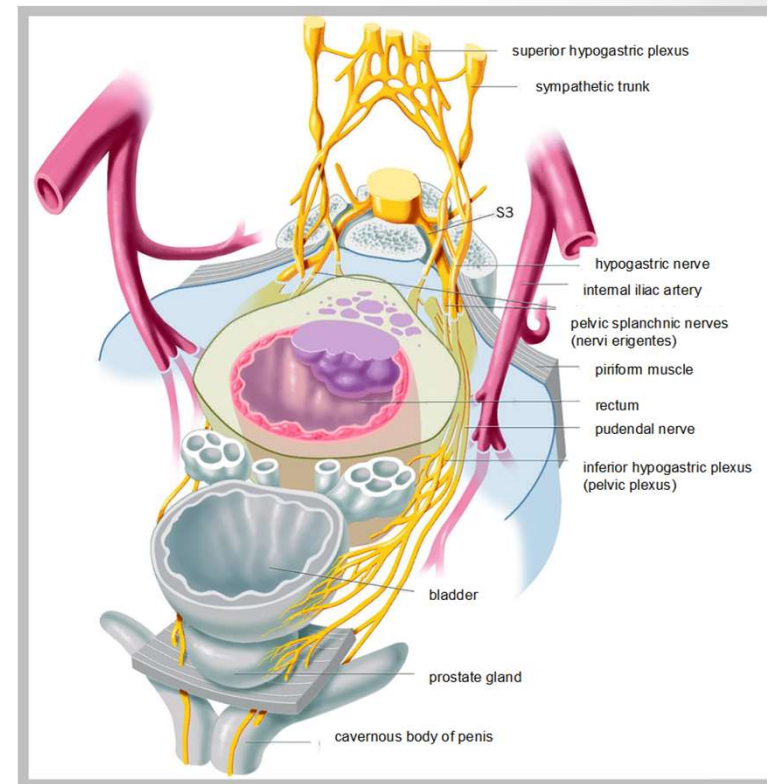
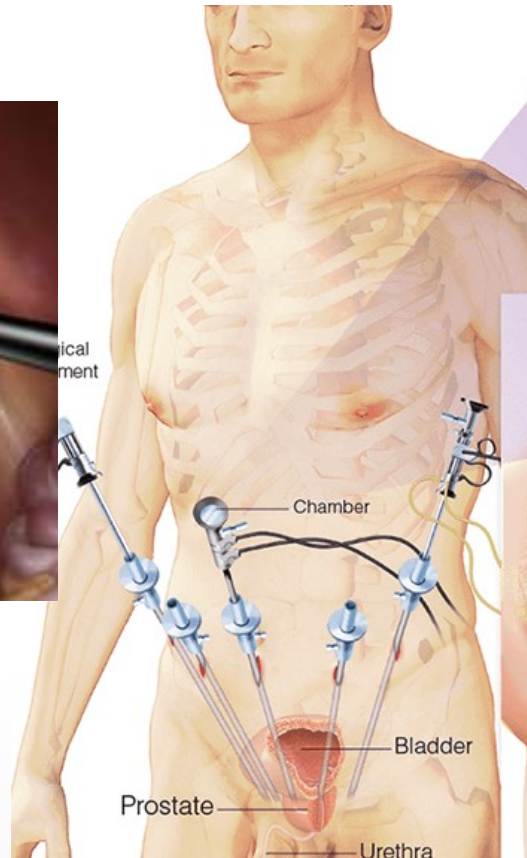
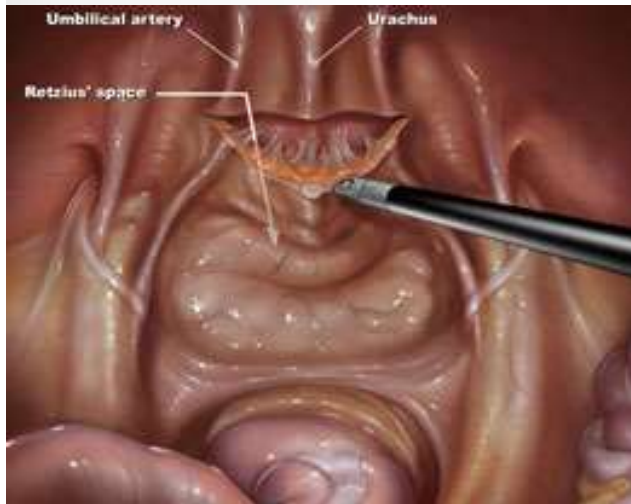
3D laparoscopic surgery: a prospective clinical trial

Antonino Agrusa¹, Giuseppe Di Buono¹, Salvatore Buscemi¹, Gaspare Cucinella², Giorgio Romano¹ and Gaspare Gulotta¹

Oncotarget, 2018, Vol. 9,

Ιδανικές Συνθήκες

- Περιορισμένα Διαμερίσματα

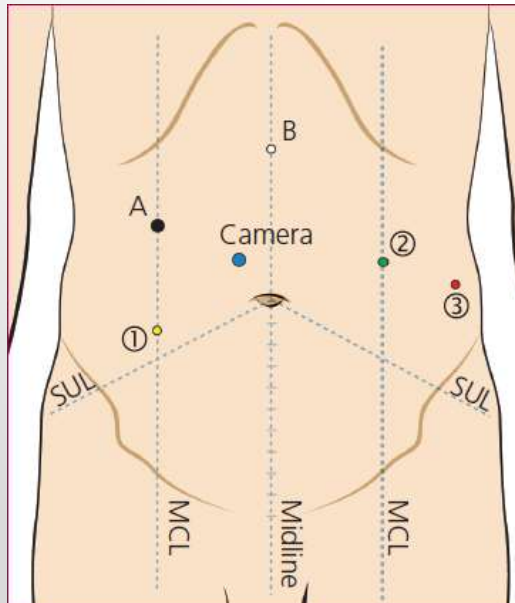
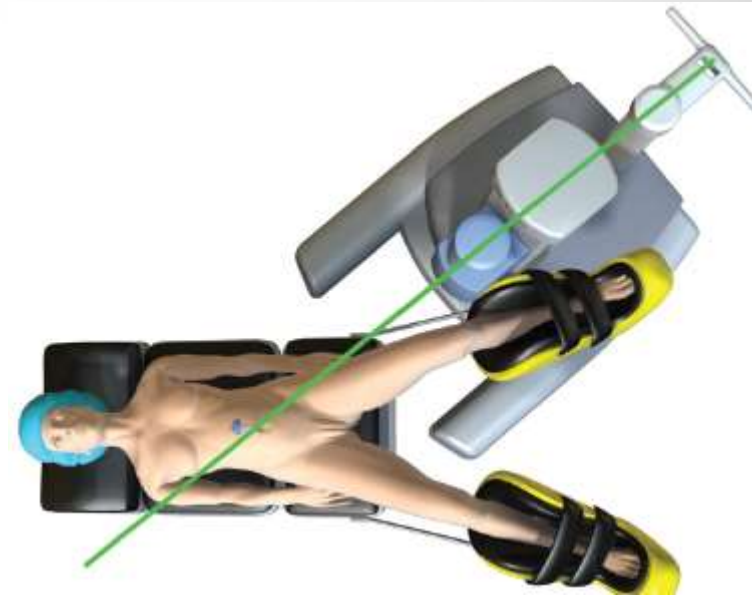


Μειονεκτήματα

- Κόστος
- Καμπύλη εκμάθησης
 - Διαφορετική από την λαπαροσκόπηση
 - Setup, Trocars, Docking
 - 30-35 cases
- Διαθεσιμότητα εξοπλισμού
- Αναγκαιότητα;;

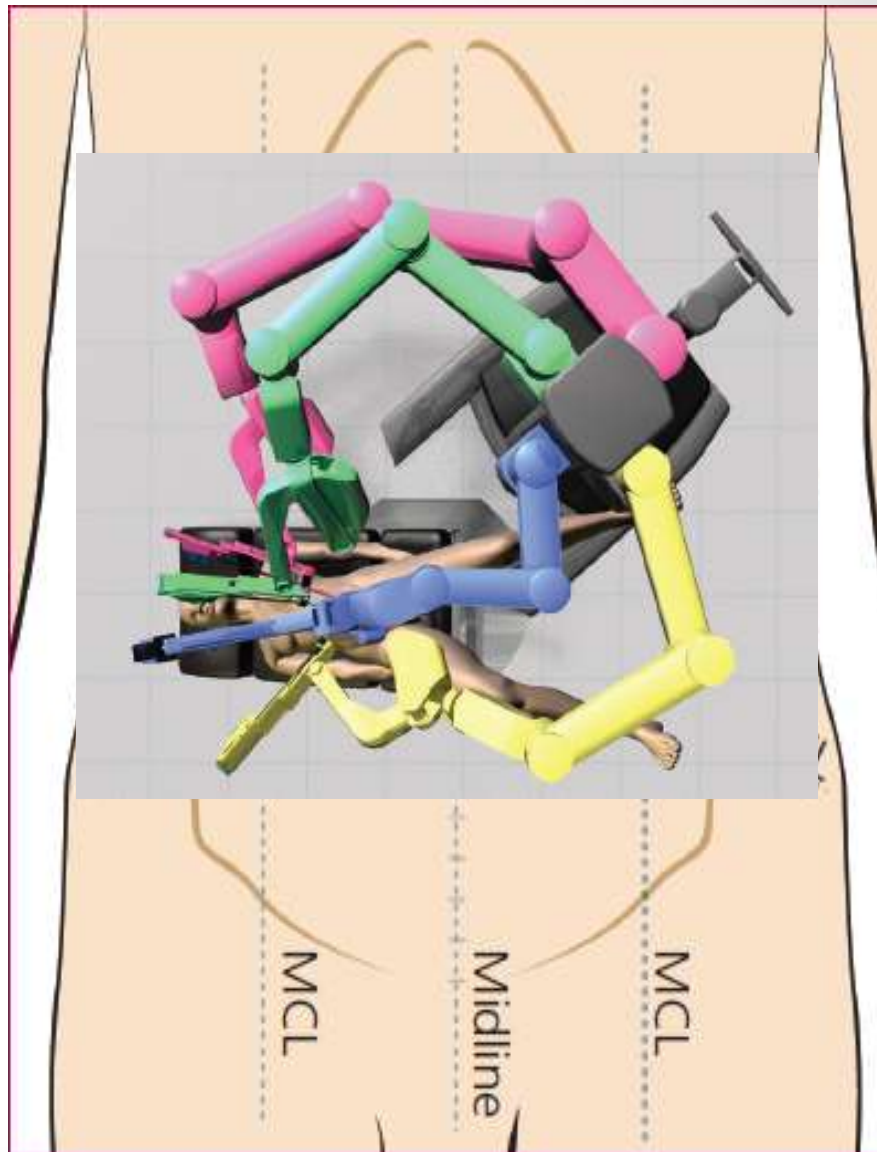
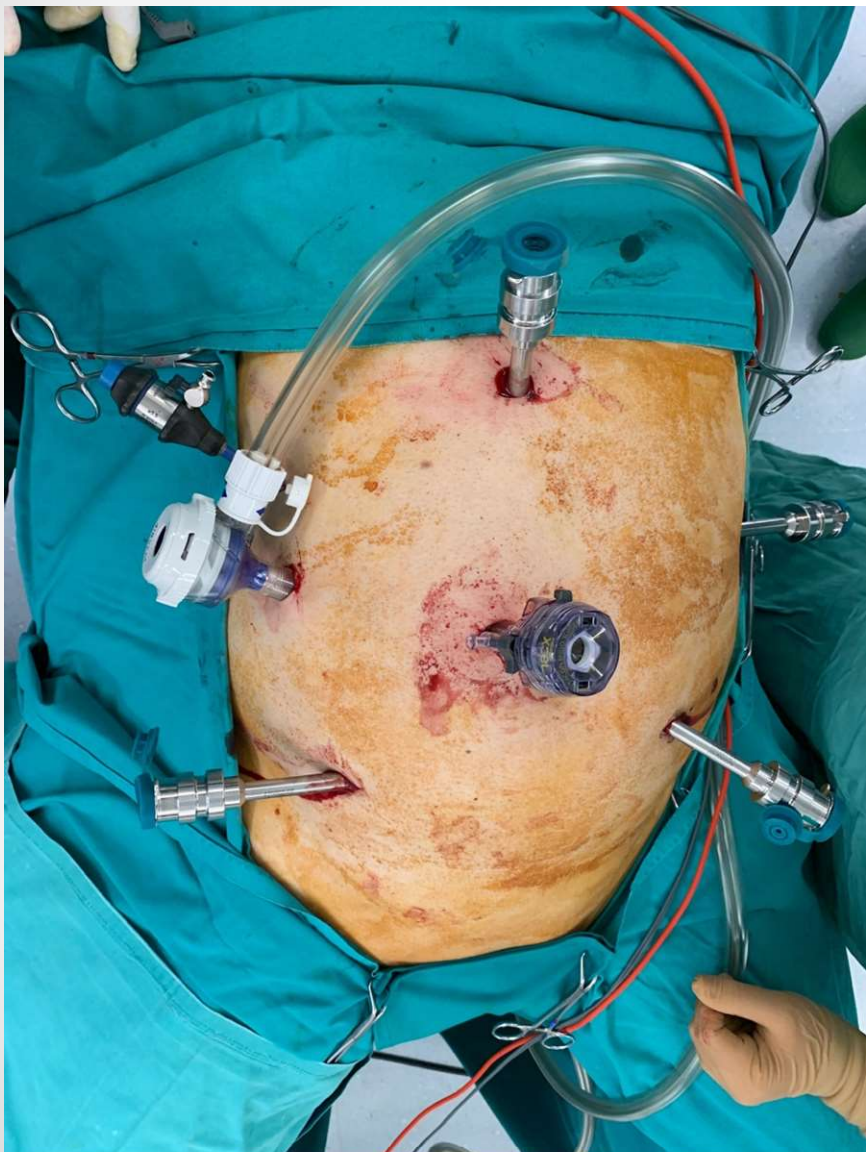


Set-Up

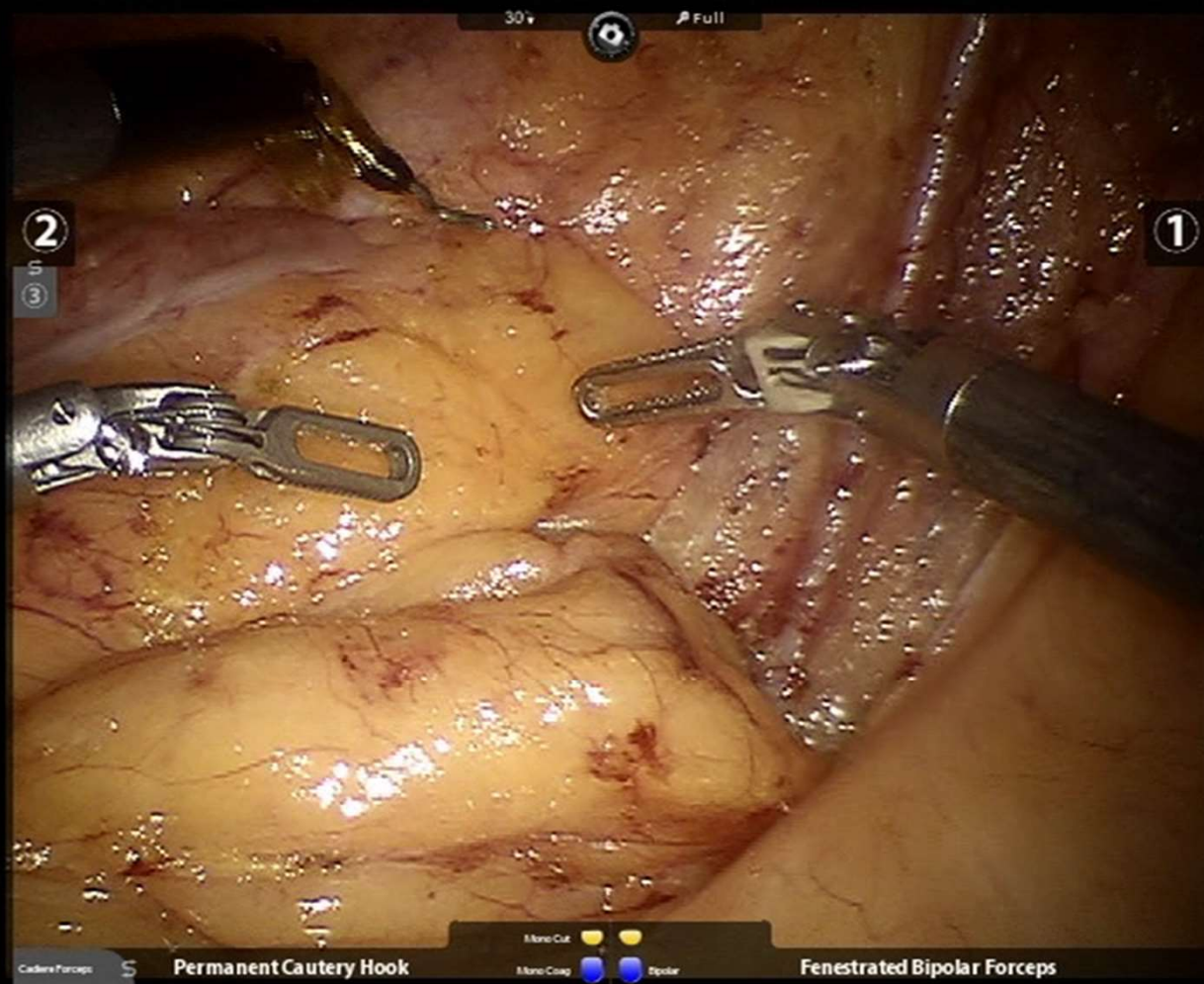


Intuitive ProcCard - LAR

Set-Up







Evidence – When to go robotic....

- Μικρότερα ποσοστά υποτροπής αλλά όχι στατιστικά σημαντικά αποτελέσματα
- Πιθανά πλεονεκτήματα σε άρρενες παχύσαρκους ασθενείς
- Ποσοστά ποιότητας χειρουργείου (CRM+) ανάλογα της λαπαροσκοπικής

Robotic colorectal surgery: more than a fantastic toy?

Innov Surg Sci 2018; 3(1): 65–68

First author	Year	Journal	Study design	Level of evidence	CRM involvement	TME quality	Conversion to open
Jayne	2017	<i>JAMA</i>	Randomized controlled trial (n=471; 237 robotic, 234 laparoscopic)	Level 2	Similar (OR=0.78, p=0.56)	–	Similar (OR=0.61, p=0.16)
Prete	2017	<i>Ann Surg</i>	Meta-analysis (n=681 from 5 studies)	Level 1a	Similar	–	Lower in robotic: 7.3% (RR=0.58, 95% CI 0.35–0.97, p=0.04)
Li	2017	<i>Medicine (Baltimore)</i>	Meta-analysis (n=3601 from 17 studies)	Level 1b	Similar (OR=0.80, p=0.256)	–	Lower in robotic: 7.3% (OR=0.35, p<0.001)
Sun	2016	<i>World J Surg Oncol</i>	Meta-analysis (n=592 from 8 studies)	Level 1b	Lower in robotic (OR=0.5, 95% CI 0.25–1.01, p=0.05)	–	Lower in robotic (OR=0.08, 95% CI 0.02–0.31, p=0.0002)
Wang	2016	<i>Surg Laparosc Endosc Percutan Tech</i>	Meta-analysis (n=1229 from 8 studies)	Level 1b	Lower in robotic (OR=0.44, 95% CI 0.20–0.96, p<0.05)	–	Lower in robotic (OR=0.23, 95% CI 0.10–0.52, p<0.01)
Speicher	2015	<i>Ann Surg</i>	US National Cancer Database (n=6403 in 2011–2012; 956 robotic)	Level 3b	Similar (5.5% vs. 4.7%)	–	Lower in robotic (9.5% vs. 16.4%, p<0.001)
Xiong	2015	<i>J Gastrointest Surg</i>	Meta-analysis (n=1229 from 8 studies)	Level 1b	Lower in robotic (2.7% vs. 5.8%; OR=0.44, 95% CI 0.20–0.96, p=0.04)	–	Lower in robotic (OR=0.23, 95% CI 0.10–0.52, p=0.0004)

Εμπειρία / Learning Curve

- Πόσες ρομποτικές ΧΠΕ χρειάζονται για proficiency?
- *Ou et al 2014 → όρια εκτομής προστάτη ελαττώθηκαν σημαντικά μετά από 250 επεμβάσεις....*
- Περιθώρια εκπαίδευσης ΚΑΙ διατήρησης ρομποτικών ικανοτήτων
- Οι περισσότεροι CR χειρουργοί της γενιάς μας είναι ΈΜΠΕΙΡΟΙ λαπαροσκόπιοι και ΆΠΕΙΡΟΙ ρομποτικοί χειρουργοί
- Εμπειρία μόνο από χειρουργική ορθού;;;



Lessons learned....

- 1982-1984, Γερμανία

to date. We thus face the following fundamental question: Do the advantages of endoscopic operations—avoidance of laparotomy, diminishing the pain of the incision, early mobilization, and avoidance of post-operative adhesions—outweigh the disadvantages—greater expenditure on technology and more complicated methods of operating?¹⁹

ture shock,” for a complete reworking of surgical concepts.¹⁴ Additionally, surgeons had an aversion to granting



*Kurt Semm, 1927-
2003, gynaecologist*

Robotic vs TaTME

Comparison of early experience of robotic and transanal total mesorectal excision using propensity score matching

Wai Lun Law¹ · Dominic C. C. Foo¹

Surgical Endoscopy (2019) 33:757–763

	TaTME N= 40	Robotic N= 40	p values				
Gender (male:female)	29:11	26:14	0.630	Complications (total)	5	7	0.755
Median age ^a	64.5 (40–79)	61.5 (45–84)	0.817	Clavien I and II	4	5	
ASA status (I:II:III)	11:52:17	8:26:6	0.828	Clavien III and IV	1	2	
Comorbid medical conditions	20	17	0.654	Anastomotic leak	2	2	1.000
Conversion	2	2	1.000	Postoperative mortality	0	1	0.478
Previous abdominal surgery	10	6	0.402	Urinary complication	1	1	1.000
Operating time (min) ^a	254 (177–462)	270 (199–564)	0.050	Stapled anastomosis	31	34	0.568
Blood loss (ml) ^a	50 (10–1000)	150 (10–2500)	0.002	No abdominal incision	33	12	<0.005
Complications	5	7	0.757	Level of anastomosis (mm) ^a	30 (10–60)	30 (10–50)	0.107
Reoperation	0	2	0.494	Level of tumor (mm) ^a	50 (20–100)	60 (20–100)	0.221
Median hospital stay (days) ^a	6 (4–22)	6 (3–47)	0.228	Size of tumor (mm) ^a	25 (0–60)	30 (0–60)	0.031
Preoperative chemoradiation	27	22	0.360	Distal margin (mm) ^a	20 (5–50)	20 (5–60)	0.116
Stage of disease			0.777	Number of LN examined	13 (3–26)	13 (5–21)	0.918
0	3	2		Positive circumferential margin	0	2	0.494
1	18	16					
2	8	7					
3	8	13					
4	3	2					

Robotic transanal total mesorectal excision assisted by laparoscopic transabdominal approach: A preliminary twenty-case series report



Je-Ming Hu^{c,d}, Chun-Ho Chu^{a,b}, Jeng-Kae Jiang^{b,e},
Yi-Ling Lai^a, I-Ping Huang^a, Andy Yi-Ming Cheng^f,
Shung-Haur Yang^{b,e,g}, Chien-Chih Chen^{a,b,*}

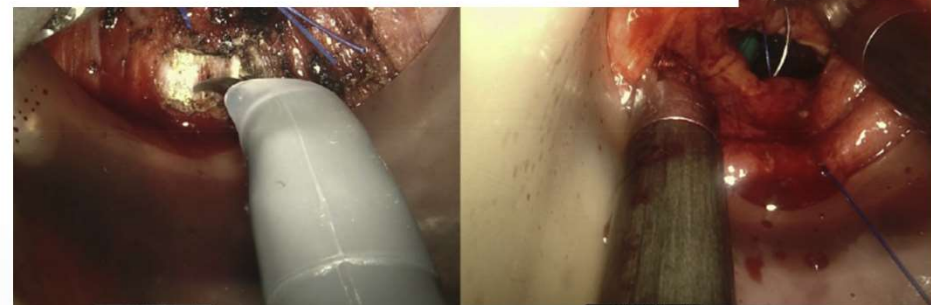
- Surgeon
- Assistar
- Scrub n



5. Conclusion



Among patients with rectal cancer suitable for curative resection, laparoscopy-assisted robotic taTME surgery is feasible and safe. However, long-term functional and oncologic outcomes still require further assessment, and novel multi-arm robotics systems (based on single-port transanal access design) may further advance the convenience, efficiency, and generalizable applicability of r-taTME.



Robotic TaTME



Robotics?

- Συνεχής βελτίωση ρομποτικών συστημάτων
- Πτώση τιμών αγοράς/χρήσης

Χειρουργική Ορθού

- Σαφή πλεονεκτήματα
- Περιορισμένο Διαμέρισμα
- Καμπύλη εκμάθησης
- Έχει δυνατότητες να γίνει standard practice για παχύσαρκους ή/και άρρενες ασθενείς
- Θετική προσέγγιση από την χειρουργική κοινότητα....



