Open, laparoscopic, transanal endoscopic,... TME the TAMIS platform

C. Cunningham MD
A. D’Hoore MD PhD
Oxford - Leuven
The laparoscopic revolution
major disruptive change

first CCD-camera
Evolution in Surgery

- Open surgery
- Laparoscopic surgery
- Robotic surgery
- MISS - surgery
- NOSE
- TAMIS - MANOS
- NOTES
- Endoscopic polypectomy
- Endoscopic biopsy
- Diagnostic endoscopy
- EMR
TME surgery optimizes local control

Heald RJ et al. The mesorectum in rectal cancer surgery: the clue to pelvic recurrence
Br J Surg 1982;69:613-616
Actual treatment in rectal cancer

Early rectal cancer (T1, T2, N0)
- TEM/TAE
- T1sm1, (sm2)

Advanced rectal cancer ≥ T3, TxN1
- Neoadjuvant (chemo)radiotherapy
- Radical Surgery
  - TME +/- proctectomy
Laparoscopic Total Mesorectal Excision
A Consecutive Series of 100 Patients

Mario Morino, MD,* Umberto Parini, MD;† Giuseppe Giraudo, MD,* Micky Salval, MD;† Riccardo Bracchet Contul, MD,† and Corrado Garrone, MD*
Meta-analysis of 12 RCT’s
Ohtani et al. J Gastrointest Surg 2011, 15: 1375-85

Hospital stay

<table>
<thead>
<tr>
<th></th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baik</td>
<td>54 vs 108</td>
</tr>
<tr>
<td>Braga</td>
<td>83 vs 85</td>
</tr>
<tr>
<td>Gonzalez</td>
<td>20 vs 20</td>
</tr>
<tr>
<td>Lujan</td>
<td>101 vs 103</td>
</tr>
<tr>
<td>Zhou</td>
<td>82 vs 89</td>
</tr>
</tbody>
</table>
Actual role of laparoscopy

2660

TME, rectal cancer 0-10cm

Open
1896 (71%)

Lap (ITT)
764 (29%)

Completed lap
676 (88%)

Converted lap
88 (12%)
Implementation of lap TME for mid + low RC in general surgical practice over 6 years
Factors affecting suitability for lap TME

- BMI
- Pelvic anatomy
- Previous surgery
- Co-morbidity preference
- Experience
- Quality assurance
- T size, fixity, level
- Anastomotic level

Colorectal Disease 2006; 8 (s3): 30-2
distal rectal anastomosis

avoid Zig–Zag stapling

> 2 firings: OR for leak 5.1

Ito M Int J Colorectal Dis 2008; 23(7) 703-707
Independent predictors for conversion and morbidity

<table>
<thead>
<tr>
<th></th>
<th>Odds ratio</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conversion</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sex (M:F)</td>
<td>3.01 (1.14-7.89)</td>
<td>.026</td>
</tr>
<tr>
<td>stapled anastomosis</td>
<td>2.42 (1.03-5.66)</td>
<td>.042</td>
</tr>
<tr>
<td>rectal fixity</td>
<td>13.80 (3.84-49.54)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td><strong>Morbidity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sex (M:F)</td>
<td>6.25 (2.67-14.58)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>stapled anastomosis</td>
<td>3.74 (1.80-7.33)</td>
<td>.010</td>
</tr>
</tbody>
</table>

34% vs 11.1%
Expanding sphincter preserving surgery: Partial and complete ISR, mucosal sleeve
Totally laparoscopic restorative proctectomy with transperineal handsewn colonic J pouch

J. Marks et al. Surg Endoscopy 2010; 24: 2700-2707
B Person et al. Surg Endoscopy 2006; 20 :700-702
TEM (1983): the first NOTES platform

Cost

Technique

Learning curve-Training

Limited indication
Endoluminal TAMIS
# Differences: TEM-TAMIS

<table>
<thead>
<tr>
<th></th>
<th>TEM</th>
<th>TAMIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>patient position</td>
<td>tumor localization</td>
<td>lithotomy/prone</td>
</tr>
<tr>
<td>platform</td>
<td>rigid TEM-proctoscope 12 or 20 cm</td>
<td>Gelpoint Path ‘floppy’</td>
</tr>
<tr>
<td></td>
<td>adapted insufflator</td>
<td>standard insufflator high flow, &lt;15 mmHg</td>
</tr>
<tr>
<td></td>
<td>specific 30° TEM-scope</td>
<td>5 or 10 mm 30° laparoscope</td>
</tr>
<tr>
<td>instruments</td>
<td>bended instruments</td>
<td>lap-instruments</td>
</tr>
<tr>
<td><strong>Investment</strong></td>
<td>+++</td>
<td>none</td>
</tr>
</tbody>
</table>
Actual role for local excision

1. ERC (low risk)

2. ERC (high risk) + adjuvant chemoradiation?

3. After neoadjuvant therapy and good response (organ sparing program)
Male patient: 75 yrs.
Moderate operative risk, ASA2
staging

first endo anal US: T1N0

second endo anal US: T1N1 (4mm node)
TEM for rectal neoplasms
experience of 300 consecutive cases

222 adenoma: 43 (19.4%) adenocarcinoma

TEM vs EMR

EAUS: overstaging 10-12%
understaging 12-27%

Allaix ME, Morino M. Dis Colon Rectum 2009;52:1831-1836
Surgical strategy

- TAE, TEM
- TME
- neoadjuvant therapy (N+)
Actual treatment

Radio chemotherapy
Excisional TEM
Further follow-up

ypT0N0 (1node)

- modalities
- how long?
How to facilitate minimally invasive TME?

- Robotic TME
  
  3D-vision
  
  intuitive wristed instruments
  
  but: costs
  
  Rolar trial: primary endpoint: conversion rate

- TAMIS TME?
Transanal NOTES
rectosigmoid resection
Porcine and human cadavers

Whiteford-Surg Endoscopy 2007
Denk-GI End 2008
Sylla-Surg End 2009
Natural Orifice transanal TME with laparoscopic assistance

No-Scar Transanal Total Mesorectal Excision
The Last Step to Pure NOTES for Colorectal Surgery

Joël Leroy, MD, FRCS

TEM – technology (stable transanal platform)
MANOS
minilaparoscopy-assisted

Transanal natural orifice transluminal endoscopic surgery (NOTES) rectal resection: “down-to-up” total mesorectal excision (TME)—short-term outcomes in the first 20 cases
Antonio M. Lacy et al. Surg Endoscopy 2013
TAMIS TME
creating the mucosal tube
closure of the mucosal tube - endoanal dissection to the puborectal
Introduction port

Introduction adapted airseal trocar through the port
Posterior dissection
Anterior dissection
Dissection on Denonvilliers fascia
Opening of the Douglas’ fold
Laparoscopic Phase posterior: incision at S3
Laparoscopic Phase posterior: incision at S3
antero lateral
Transanal endoscopic proctectomy
innovative procedure for difficult resection of rectal tumors
in men with narrow pelvis (n=30, Jan 2009 - June 2011)

Laparoscopic assisted (splenic flexure)

Main causes for TAEP
- narrow pelvis 23
- fatty mesorectum 14
- large anterior tumor 22

Morbidity
urethral Injuries (n=2, 7%)
reoperation (n=2, 7%)

Hospitalization 14d (19-25)

Rouanet Ph et al. *Dis Colon and Rectum* 2013
Required surgical skills for ‘bottom-up’ TME

- TME surgery and different types of reconstruction
- Sleeve resections (colo-anal anastomosis)
- TEM surgery (TAMIS)
- Laparoscopic techniques
Challenges for the future on the eve of a further evolution in TME surgery

- Minimally Invasive surgery vs CRT and wait and see for early rectal cancer

- Tailored surgical approach in rectal cancer

- Defining the different role of various surgical approaches

- Safe implementation will remain the major challenge