



Local Excision of Rectal Cancer Techniques and Outcomes

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Overview



- Techniques & Description
- Patient Selection
 - Patient factors
 - Disease factors
 - Preop staging
- Oncologic Results vs. Radical Surgery
- Role of Adjuvant Therapy
- Salvage Therapy for Recurrence



Techniques



- Polypectomy
- Endoscopic Mucosal Resection (EMR)
- Conventional Transanal Resection
- Transanal Endoscopic Microsurgery (TEM)
- Kraske
- York-Mason



Posterior Approaches



- Kraske (Transsacral resection)
 - Prone jackknife
 - Incision 2-10 cm from anal verge posterior midline
 - Dissect down to and divide anococcygeal ligament
 - Resect coccyx and lower 2 segments sacrum
 - Divide Waldeyer's fascia
 - Sleeve resection or proctomy/resection with 1 cm margin
 - 20% fecal fistula



Posterior Approaches



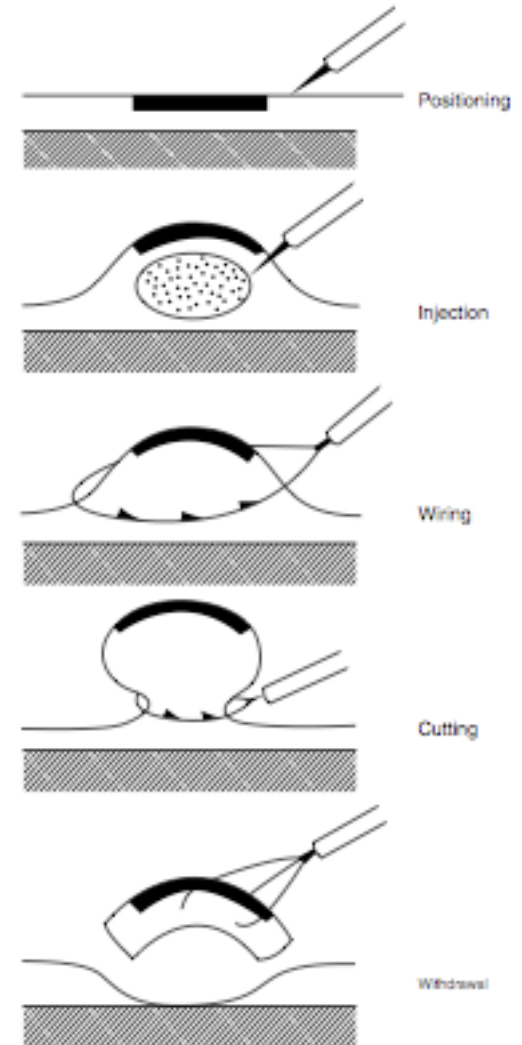
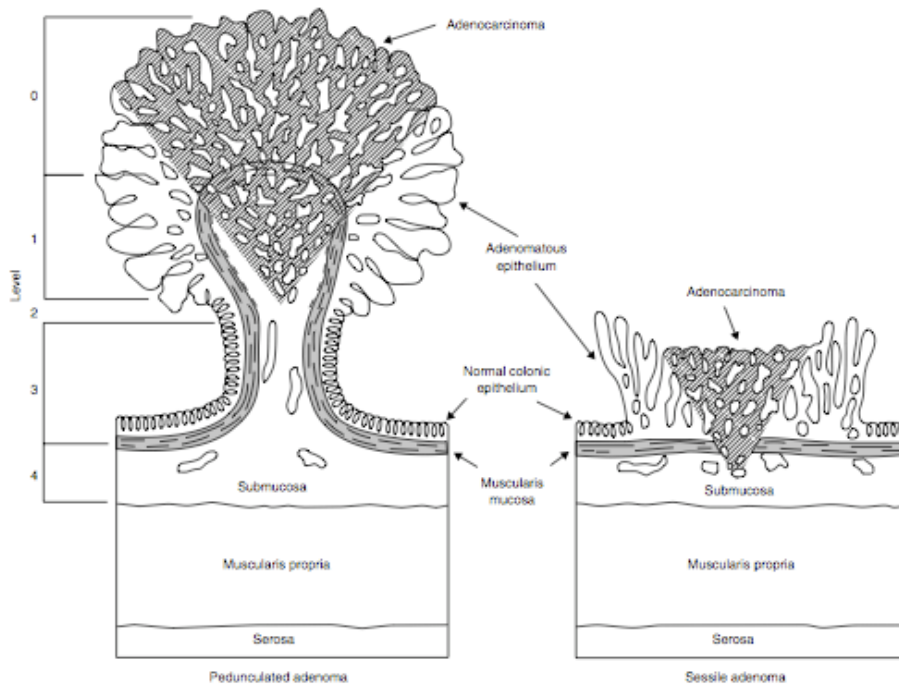
- York-Mason (Transsphincteric resection)
 - Prone jackknife
 - Transect entire sphincter complex incl puborectalis, tag components to resuture
 - Sleeve resection or proctotomy/resection
 - Reconstitute sphincter
 - Incontinence/fecal fistula



Polypectomy/EMR



- For benign lesions
- Tattoo suspicious lesions





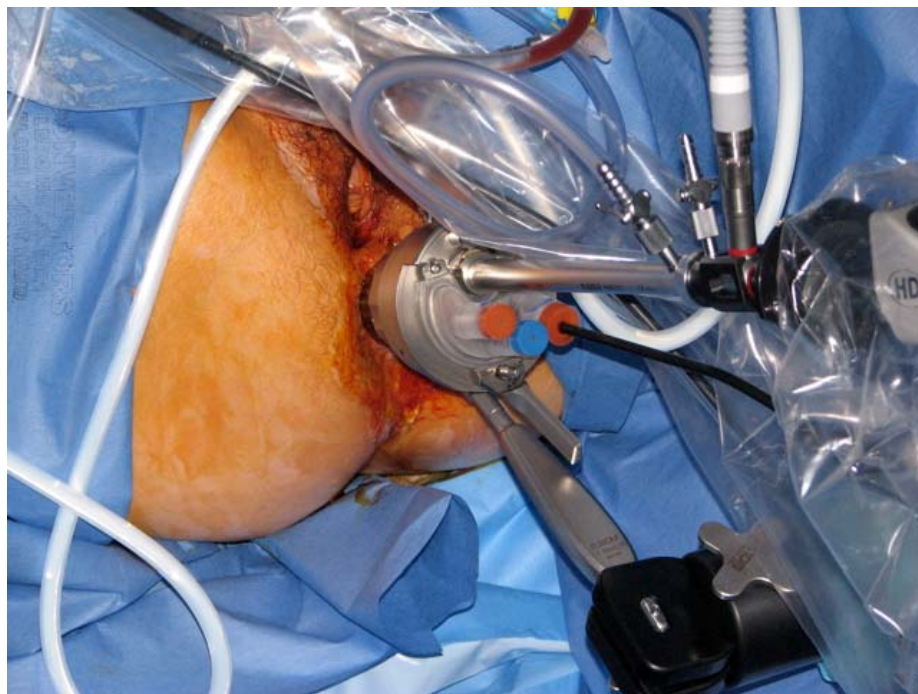
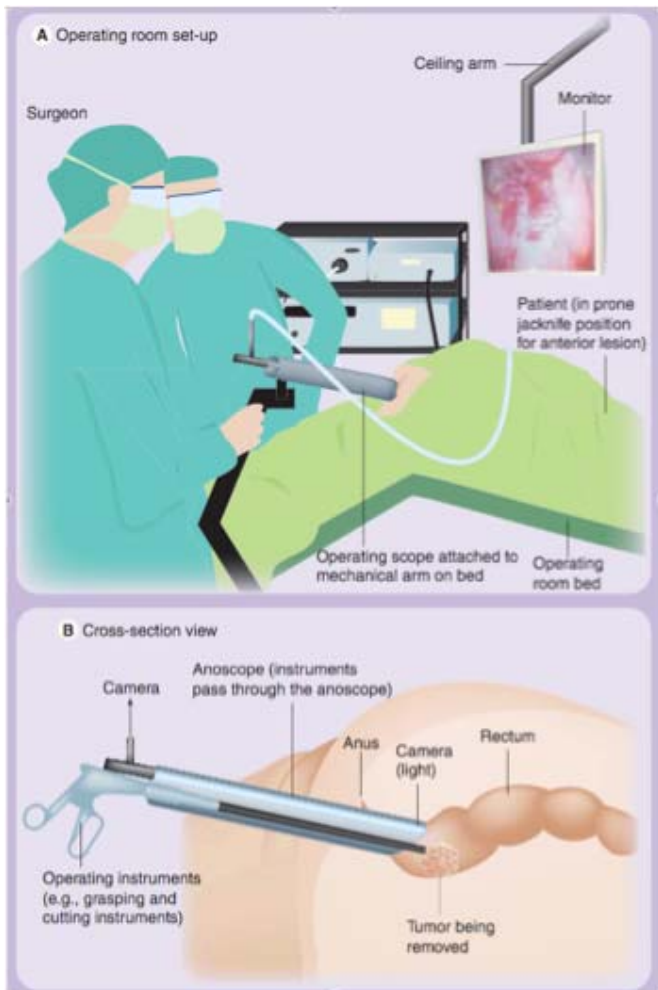
Transanal Excision



- Lithotomy for posterior lesions, prone for anterior
- Good lighting (headlight, lighted retractor)
- Cautery score 1 cm margin
- Full thickness rectal wall excision (careful anteriorly)
- Babcock prolapse for more proximal lesions
- Pin & orient lesion
- Palpate mesorectal fat for nodes
- Suture closed



Transanal Endoscopic Microsurgery (TEM)





TEM



- Described in 1984 (Buess et al.)
- 40mm operating insufflating proctoscope
- Lesions from 5-25 cm
- Full thickness resection (may include nodes)
- 1 cm margin
- Suture closure or left open
- Home next day



TEM



- Not widely available
- Technically challenging
- Time consuming
- Expensive



TEM





When to Consider Local Excision?

- Aim for cure
- Early (T1, T2?)
- Lymph node involvement
- High risk pathologic features
- Technically possible (height, size/ % circumference)
- Patient at high risk for radical resection
- Palliative



Why do Local Excision?



- Sphincter preservation (even very low rectal cancers)
- Minimal mortality/morbidity
- Minimal hospital stay/recovery
- No risk of genitourinary dysfunction



Keep in mind...



- Kapitejn et al. Preoperative radiotherapy combined with total mesorectal excision for resectable rectal cancer. NEJM 2001.
- T1-2, N0 lesions: 0.7% recurrence rate



Patient Selection



- Find Stage I cancers
- Preoperative Staging
 - Clinical examination (DRE)
 - 70% accuracy T-stage, 50% N-stage
 - ERUS
 - 90% T-stage, 80% N-stage
 - MRI
 - 80-90% T-stage, 70% N-stage
 - CT
 - Local invasion, distant mets



Patient Selection



- T-stage vs. nodal status
 - T1: 0-12% +nodes
 - T2: 12-28%
 - T3: 49-79%
- Tumour grade:
 - 14% +nodes if well- or moderately-differentiated T1/2
 - 30% +nodes if poorly differentiated



Patient Selection



- Lymphovascular/Perineural Invasion
 - 14-17% if no LVPI
 - 33% if +LVPI
- Blumberg et al. Dis Col Rectum 1999; 42(7):881-5
- St. Mark's Lymph Node Positivity Model
 - www.riskprediction.org.uk/index-lnp.php



Patient Selection

- Depth of submucosal invasion in T1 cancers (sm1/2/3) – Kikuchi et al. Dis Col Rectum 1995; Nascimbeni et al. Dis Col Rectum 2002
- Sm1: 0-3% node+
- Sm2: 8-10%
- Sm3: 23-25%

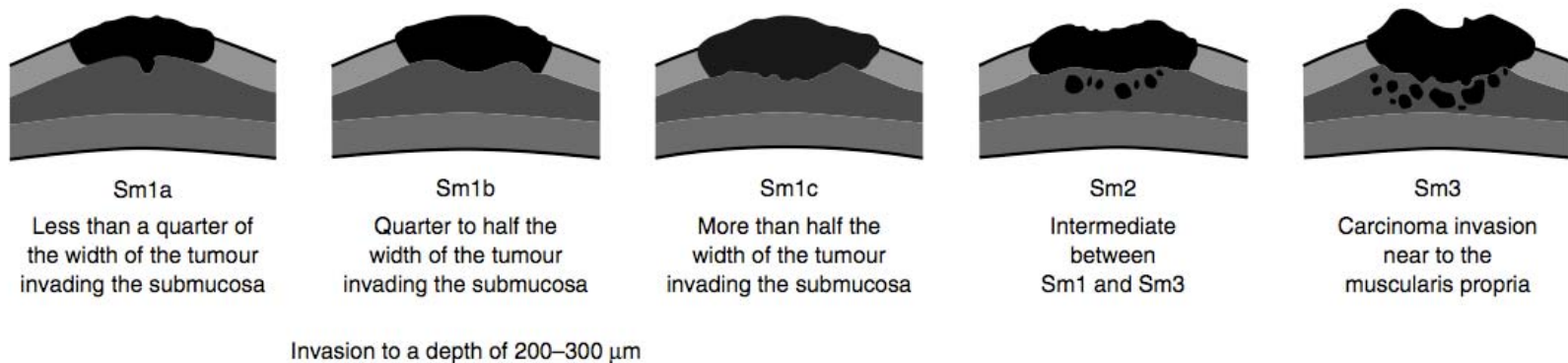


Fig. 4 Kikuchi classification of adenocarcinoma in a sessile polyp⁷⁹. Sm, submucosal layer



Patient Selection



- Palliative
 - small lesion, distant mets
- High risk patient
 - Multiple comorbidities
- Patient refuses colostomy, risk of sexual dysfunction, etc.
 - Willing to accept higher recurrence rate



Results: Transanal



- Early series (up to 1990s)
 - Recurrence rate T1 cancers 0-4% to 17-33%
- No randomized controlled trials comparing conventional transanal to radical surgery
- Best evidence from cohort studies



Results: Transanal



Results of Local Excision Alone According to T Stage for Rectal Cancer

| Study | Year | No. of Patients | T1 Tumor | | T2 Tumor | |
|-------------------------------------------|------|-----------------|----------|-----|----------|----|
| | | | DFS | DFS | DFS | LR |
| Stipa <i>et al.</i> ⁵¹ | 2004 | 47 | 92 | 16 | 75 | 20 |
| Maeda <i>et al.</i> ⁵² | 2004 | 91 | – | 2 | – | 15 |
| Gopaul <i>et al.</i> ² | 2004 | 64 | – | 13 | – | 24 |
| Gao <i>et al.</i> ³⁶ | 2003 | 47 | 94 | 11 | 83 | 27 |
| Patty <i>et al.</i> ³⁷ | 2002 | 94 | 92 | 14 | 87 | 28 |
| Garcia-Aguilar <i>et al.</i> ⁹ | 2000 | 82 | 77 | 18 | 63 | 37 |
| Mellgren <i>et al.</i> ⁷ | 2000 | 108 | 72 | 18 | 65 | 47 |
| Steele <i>et al.</i> ⁴ | 1999 | 110 | 83 | – | 71 | – |
| Chakravarti <i>et al.</i> ⁵³ | 1999 | 52 | 80 | 11 | 33 | – |
| Faivre <i>et al.</i> ⁵⁴ | 1996 | 126 | 84 | – | 65 | – |
| Sticca <i>et al.</i> ⁵⁵ | 1996 | 71 | 91 | 0 | 88 | 10 |
| Baron <i>et al.</i> ⁵⁶ | 1995 | 76 | 86 | 19 | 89 | 21 |

DFS = five-year disease-free survival; LR = local recurrence.

Data are percentages unless otherwise indicated.



Results: Transanal + RT (Series)



Results After Local Excision and Adjuvant Chemoradiotherapy for Rectal Cancer

| Study | Year | No. of Patients | Stage | | | LR (%) | DR (%) | Survival Five-Year (%) | Follow-Up (mo) |
|-----------------------------------------|------|-----------------|-------|----|----|--------|--------|------------------------|----------------|
| | | | T1 | T2 | T3 | | | | |
| Hershman <i>et al.</i> ⁶⁶ | 2000 | 25 | 19 | 6 | 0 | 8 | – | 92 | 31 |
| Benson <i>et al.</i> ⁶⁷ | 2001 | 68 | 24 | 36 | 8 | 27 | 12 | 67 | 60 |
| Le Voyer <i>et al.</i> ⁶⁸ | 1999 | 35 | 15 | 16 | 4 | 11 | 9 | 91 | 46 |
| Bouvet <i>et al.</i> ⁶⁴ | 1999 | 73 | 33 | 27 | 13 | 15 | 8 | 82 | 51 |
| Chakravarti <i>et al.</i> ⁵³ | 1999 | 47 | 14 | 33 | 0 | 10 | – | 74 | 51 |
| Fortunato <i>et al.</i> ⁶⁵ | 1999 | 21 | 2 | 15 | 4 | 19 | 19 | 77 | 56 |
| Coco <i>et al.</i> ⁶² | 1992 | 15 | 0 | 15 | 0 | 6 | 6 | 74 | 68 |

LR = local recurrence; DR = distant recurrence.

^a Six-year disease-free survival.



Results: Transanal + RT (Comparative)

Local Recurrence Rates After Local Excision Alone and Local Excision with Adjuvant Radiochemotherapy for T1 and T2 Rectal Cancers

| Study | Year | No. of Patients | T1 Tumor | | T2 Tumor | |
|-----------------------------------------|------|-----------------|----------|---------|----------|---------|
| | | | LE | LE + RT | LE | LE + RT |
| Chakravarti <i>et al.</i> ⁵³ | 1999 | 47 | 11 | 0 | 67 | 15 |
| Taylor <i>et al.</i> ³⁵ | 1998 | 34 | 24 | 50 | 50 | 11 |
| Varma <i>et al.</i> ⁵ | 1999 | 23 | 5 | 0 | 46 | 0 |
| Lamont <i>et al.</i> ⁶³ | 2000 | 48 | 23 | 0 | 0 | 20 |
| Gopaul <i>et al.</i> ² | 2004 | 64 | 11 | 25 | 36 | 9 |
| Paty <i>et al.</i> ³⁷ | 2002 | 125 | 15 | 15 | 30 | 25 |

LE = local excision alone; LE + RT = local excision with adjuvant radiochemotherapy.

Data are percentages unless otherwise indicated.



Results: TEM



Table 1 Comparative studies in transanal endoscopic microsurgery (TEM) *vs* radical resection (RR) or laparoscopic resection (LapR).

| Reference | Procedure (n) | Tumour | Follow-up | LR | Other survival outcome | Operative outcomes |
|----------------------------------|------------------------------------------------|-----------------------------------|---------------------------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [12] Winde (1996)* Level II | TEM (24) AR (26) | 50 T1 (G1/2) | TEM 40.9 AR 45.8 | 4.1% (1/24) TEM 0% (1/26) AR <i>P</i> = NS | Mets: TEM 0% <i>vs</i> AR 3.8% (1/26) No difference in 5 year survival (96% each group) | TEM had less complications, decreased 20.8% (5/24) <i>vs</i> 34.5% (9/26), mean operative time (103 min <i>vs</i> 149 min; <i>P</i> < 0.05), decreased blood loss (143 ml <i>vs</i> 745 ml; <i>P</i> < 0.001) decreased daily analgesia requirement (<i>P</i> < 0.0001) and LOS (5.7 days <i>vs</i> 15.4 days; <i>P</i> < 0.001) |
| [17] Heintz (1998)† Level III | TEM (56) Parks (2) RR (45) | 80 low risk T1 23 high risk T1 | 52 [~] (+/-23) 43 (+/-22) | Low risk T1: LE (2/46) <i>vs</i> RR (1/34) High risk T2: LE (4/12) <i>vs</i> RR (0/11). | Low-risk T1: 5 year survival; TEM 79% <i>vs</i> 81% RR. (<i>P</i> = 0.72) High-risk T1: 5 year survival TEM 62% <i>vs</i> RR 69% (<i>P</i> = 0.47) | TEM decreased complications 3.4% (2/58) <i>vs</i> 18% (8/45) and decreased mortality 0% <i>vs</i> 3.8% (2/45). No difference in 5 year survival. In high-risk T1 group, patients treated with TEM were older than those treated with RR, mean 74 years <i>vs</i> 63 years. (<i>P</i> = 0.048). All recurrences following LE occurred in tumours with resection margin involvement previously |
| [18] Langer (2003)† Level III | RR (27) TP (76) TEM-ES(45) TEM-UC(34) | 118 Ad 59 T1 (G1/2) 5 other | TEM 21.6 RR 33.7 | TEM 10% (2/20) <i>vs</i> 4% (RR) | 2 year survival 100% TEM <i>vs</i> 96% RR | TEM decreased morbidity (8% <i>vs</i> 56%), mortality (0% <i>vs</i> 3.7%), operating time (100 min <i>vs</i> 152 min; <i>P</i> = 0.0001), transfusion requirement (9% <i>vs</i> 43%; <i>P</i> = 0.0003) and LOS (8.2 days <i>vs</i> 14.5 days; <i>P</i> = 0.0001) |
| [20] Lee (2003)† Level III | TEM (74) RR (100) | 52 T1 22 T2 100 T1/2NO | TEM 31 RR 35 | T1 at 5 year: 4% TEM 0% RR; <i>P</i> = 0.95 T2 at 5 year: 20% TEM 9% RR; <i>P</i> = 0.04 | T1 at 5 year DFS TEM 96% <i>vs</i> RR 94% (<i>P</i> = 0.35) T2 at 5 year DFS TEM 81% <i>vs</i> RR 83% (<i>P</i> = 0.12) | TEM decreased complications (4.1% <i>vs</i> 48%) |
| [13] Lezoche (2005)* Level II | TEM (20) LR (20) | 40 T2NO G1/2 | 56 (44-67) | TEM 5% (1/20) LapR 5% (1/20) | Recurrence/metastases probability at 77.6 months: 10% (TEM) <i>vs</i> 12% (LapR) Survival probability at 77.6 months: 95% (TEM) <i>vs</i> 83% (LapR) | TEM associated with decrease operating time (95 min <i>vs</i> 170 min; <i>P</i> < 0.001), decreased blood loss (50 ml <i>vs</i> 200 ml; <i>P</i> < 0.001) analgesic use (2% <i>vs</i> 20%; <i>P</i> < 0.001) and LOS (4.5 days <i>vs</i> 7.5 days; <i>P</i> < 0.001). |



Results: TEM



Table 3 Gastrointestinal function and quality of life postTEM.

| Author | n | Assessment | Method | Result |
|----------------------|----|-----------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [25] Cataldo 2005 | 37 | Pre- and 6 weeks | FISI; FIQL | No change in function 6 weeks postTEM |
| [22] Dafnis 2004 | 48 | Median 22 months | Questionnaire Wexner/Kamm | 37% (18/48) decreased continence |
| [70] Wang 2003 | 22 | Pre-, 2 and 6 weeks 3 months, 1 year | AR manometry Questionnaire | Transient lower squeeze pressures at 2, 6 weeks but recovered at 1 year. Mean continence better at 3 months vs preTEM (NS) |
| [29] Kennedy 2002 | 13 | Pre-, 3 and 6 weeks | AR manometry PNTML Electrosensitivity Interview | Decrease sphincter tone at 6 weeks correlates with duration of procedure > 2 h. No change in continence |
| [26] Herman 2001 | 33 | Pre-, 3 weeks, 6 months | AR manometry ISS | Decrease ISS at 3 weeks. ISS at 6 months better than pre- (NS). Suggested risk factors for anorectal dysfunction postTEM was postoperative internal anal sphincter defects, low preoperative resting anal pressure, disturbed anorectal co-ordination, > 50% circumferential excision and full thickness excision in this study |
| [30] Kreis 1996 | 42 | Pre-, 3 months, 1 year | AR manometry Interview | Decreased squeeze pressure and continence at 3 months with full recovery at 1 year |
| [28] Banerjee 1996 | 36 | Pre- and 12 months | AR manometry Questionnaire | Decreased resting pressures but not continence |
| [27] Hemmingway 1996 | 6 | Pre-, 48 h, 6 weeks | AR manometry Interview | Decreased resting and squeeze pressure to 75% and 653% preop levels at 48 h. All pressures normal at 6 weeks. No incontinence |

FISI, Faecal Incontinence Severity Index; FIQL, Faecal Incontinence Quality of Life; PNTML, Pudendal Nerve Terminal Motor Latency; Pre-, preoperative; ISS, Incontinence Severity Index; AR manometry, Anorectal manometry +/- physiology.



Salvage Surgery for Recurrence

- Friel et al. Dis Colon Rectum 2002
 - 90% of recurrence post local excision are within mesorectal planes
 - Inadequate local control
 - Pathologic stage of recurrent tumour higher than primary in 93%
- Baron et al. Dis Colon Rectum 1995
 - 155 pts initial local excision
 - 21 immediate APR for high risk features vs 21 APR for local recurrence
 - DFS 95% vs. 56% ($p < 0.005$)



Summary



- Conventional transanal excision and TEM are alternatives to radical resection for early rectal cancer
- Recurrence rates are significantly higher for local excision
- Radiotherapy appears to have benefit beyond simple excision, but is not equivalent to radical surgery
- TEM may have better oncologic outcomes than transanal excision
- Salvage therapy for recurrence after local excision is not always successful
- Local excision for rectal cancer may be the appropriate choice depending on pathologic and patient factors