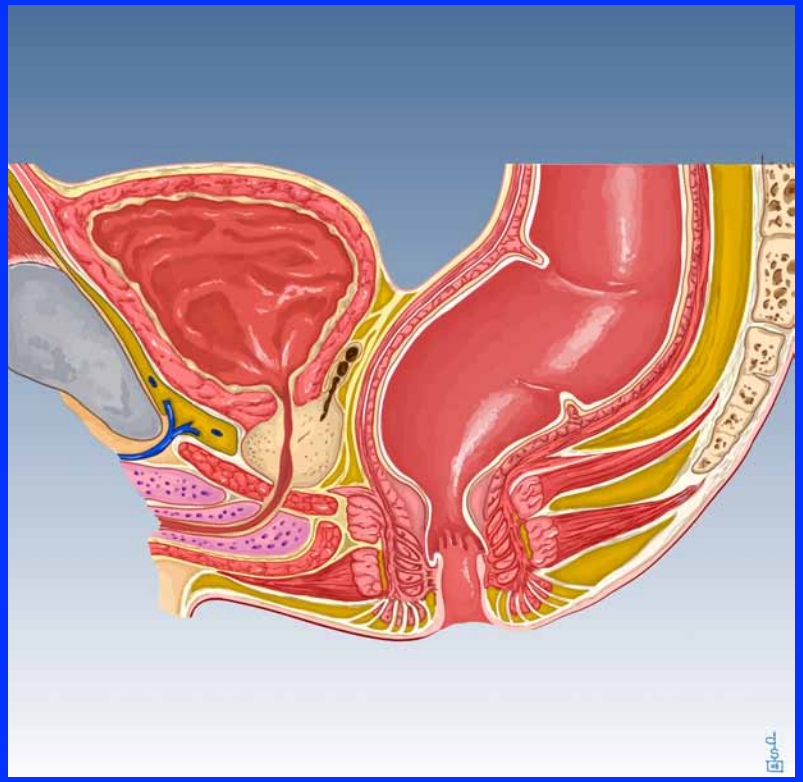
# Prone vs Lithotomy for APR

**Terry Phang**

St. Paul's Hospital
University of British Columbia

# Identified Problem – Difficulty achieving negative CRM for distal third rectal location

- Absence of mesorectal margin “cushion”
- Difficult technical dissection due to lack of planes
- High positive radial margin rate (~36%) for distal third rectal location in BC



# BC rectal margins

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| | |
|---|---|
| Upper third (11-15 cm) | 15% |
| Mid third (6-10 cm) | 12.5% |
| Distal third (1-5 cm) | 36.4% |

# Effect of rectal third location on *local recurrence* in BC

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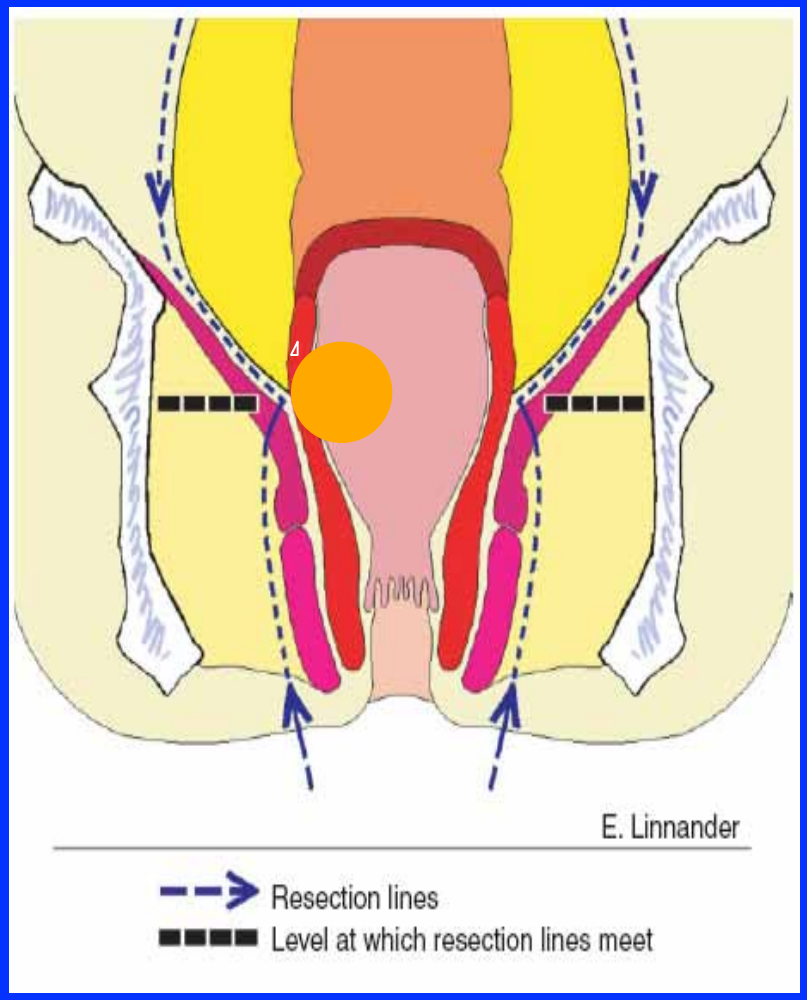
| | | Hazard Ratio | 95% Confidence Limits | P-value |
|---|---|---|---|---|
| Location | Upper | 1.00 | | |
| | Mid | 1.45 | 0.59-3.57 | 0.42 |
| | Distal | 5.08 | 1.62-15.96 | 0.01 |

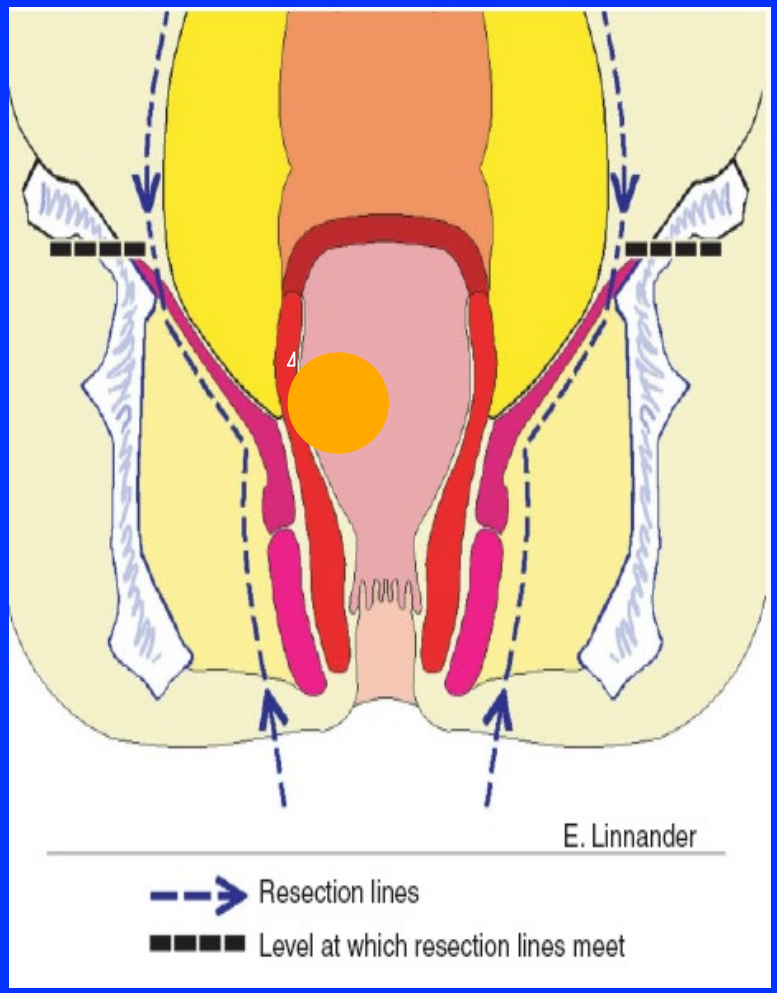
# Universal Problem – Distal Third Location

| Dutch TME trial | AR | APR |
|---|---|---|
| Positive margins | 10.7% | 30.4% |
| Perforations | 2.5% | 13.7% |
| Survival | 57.6% | 38.5% |

Nagtegaal et al. J Clin Oncol 2005; 23:9257

# APR - Conventional vs Extralevator (cylindrical)



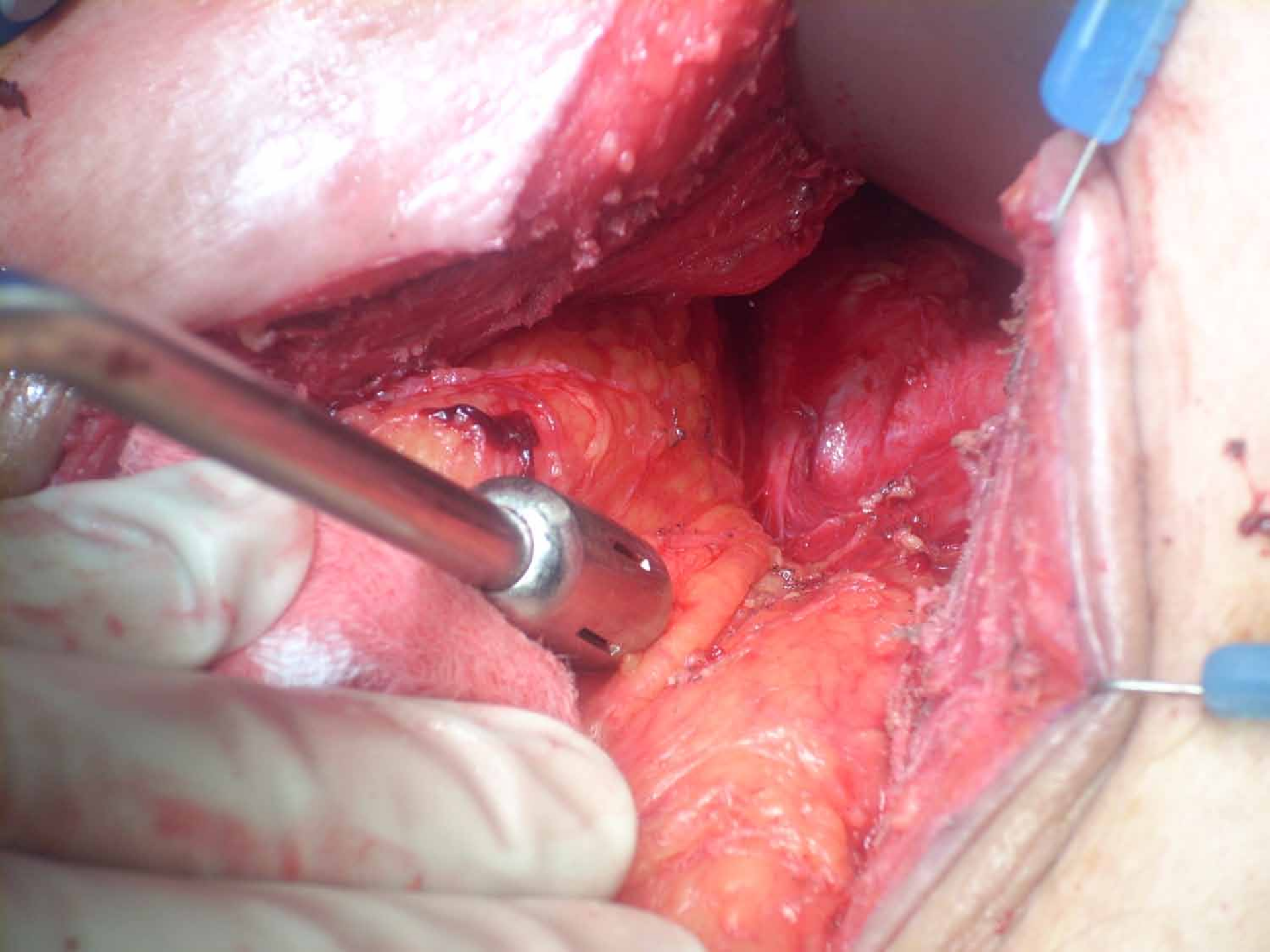



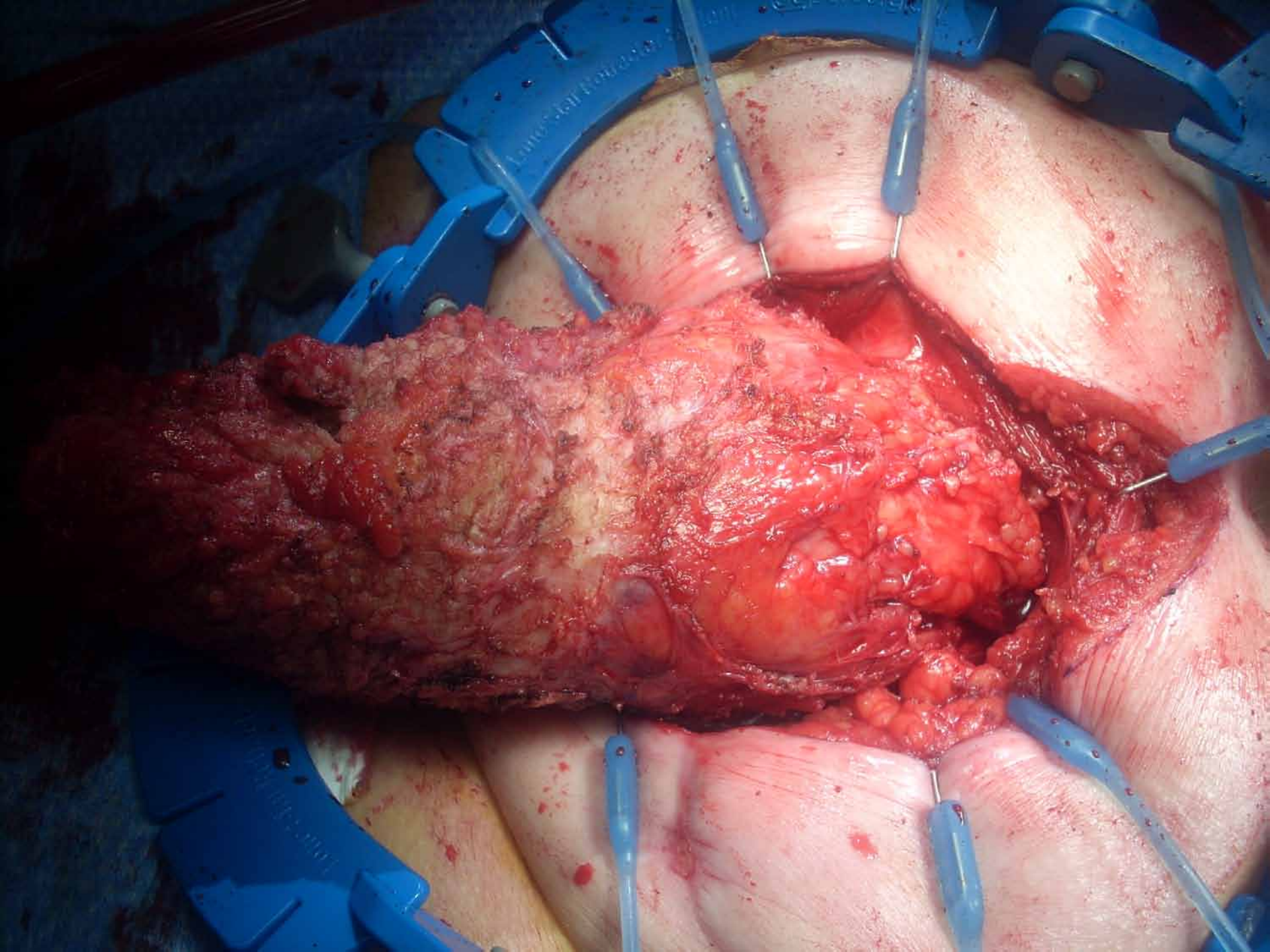

*Adapted from* Holm et al. Br J Surg 2007; 94: 232

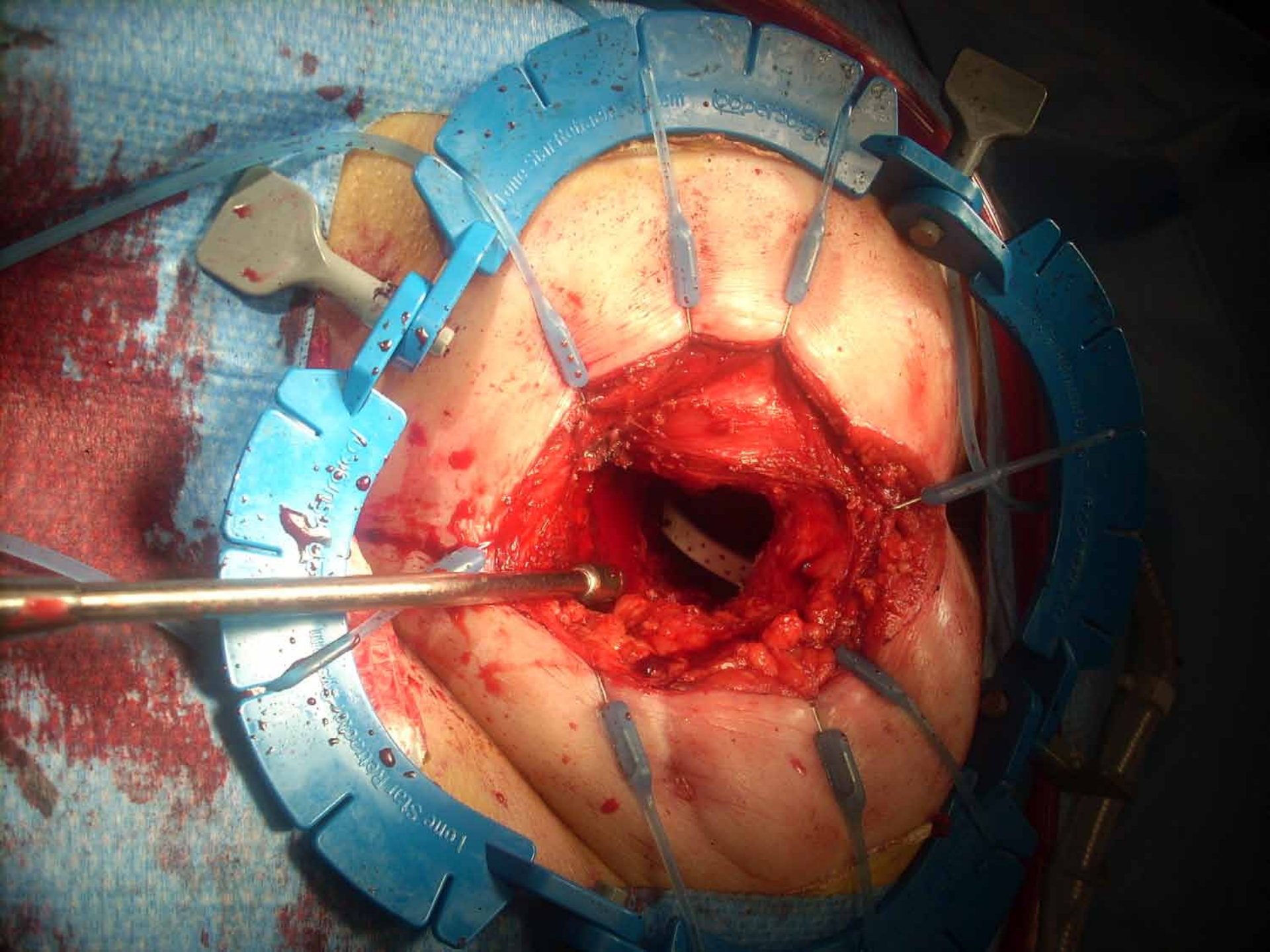
# APR specimens - Conventional vs extralevator

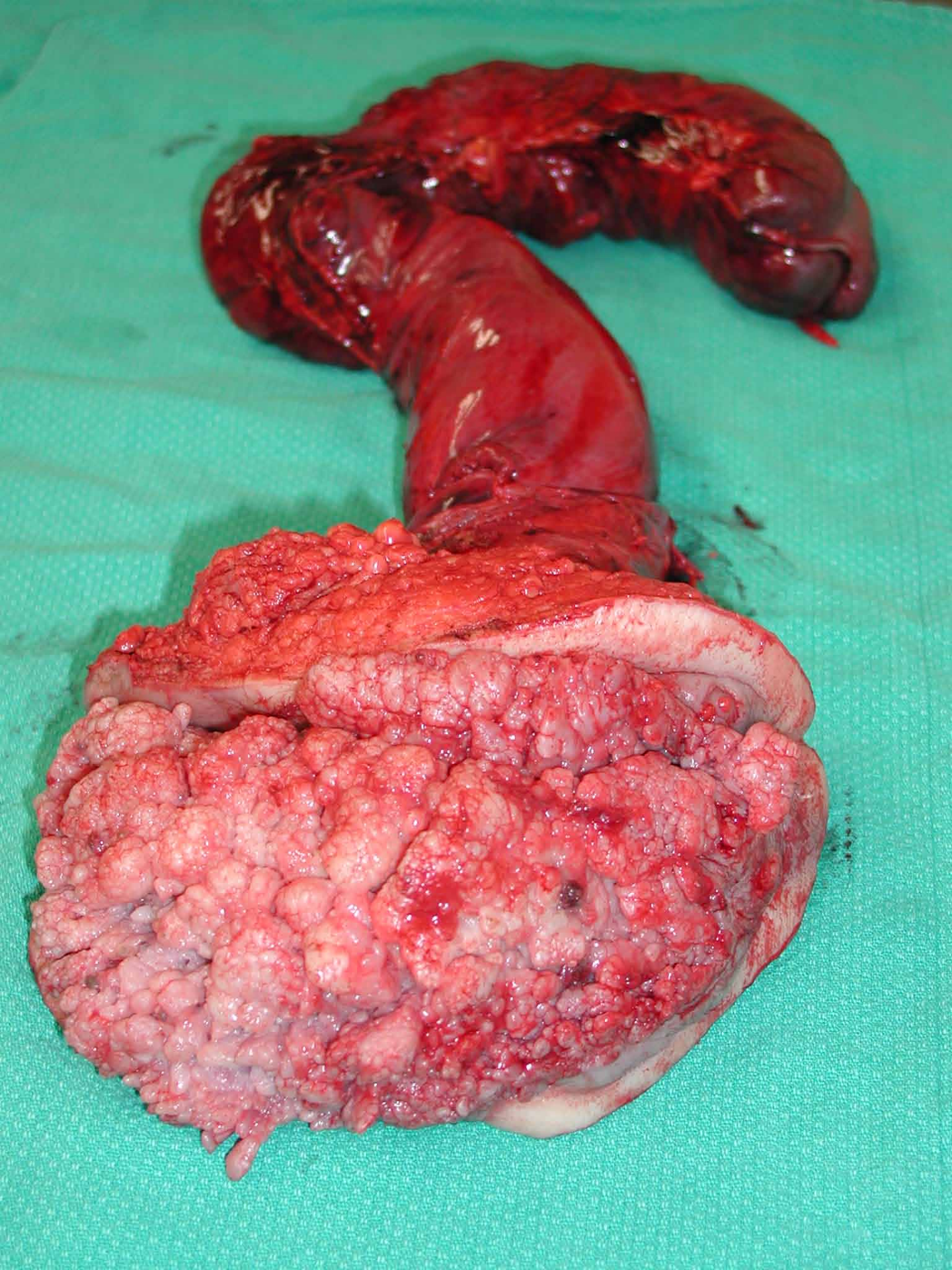
Holm et al. Br J Surg 2007; 94: 232


Lone Star Retractor System
OpenStar









# Stockholm - Extralevator APR

| Case series, 2007<br>N = 28 | ypT0<br>(n=2) | ypT3<br>(n=20) | ypT4<br>(n=6) |
|---|---|---|---|
| Perforation | 0 | 1 | 0 |
| Margin pos | 0 | 0 | 2 |
| 1.5 yr local recurrence | 0 | 0 | 2<br>(7%) |

Holm et al. Br J Surg 2007; 94: 232

# Warsaw –Anterior Resection vs Extralevator APR

| Case series, 2007 | AR N=154 | APR N=43 |
|---|---|---|
| 5-yr local recurrence | 5.8% | 4.7% |
| 5-yr survival | 57.1% | 60.4% |

Bebenek et al. Eur J Surg Oncol 2007; 33:320

# Stockholm + Leeds : Conventional vs Extralevator APR

| Case series | Conventional | Extralevator |
|---|---|---|
| 1997 – 2007 | N = 101 | N = 27 |
| Perforation | 22.8% | 3.7% |
| P < 0.025 | | |
| CRM pos | 40.5% | 14.8% |
| P < 0.0001 | | |

West, J Clin Oncol 2008; 26: 2517

Conventional

Extralevator, Leeds

Extralevator, Valencia

Extralevator,
Exeter

Extralevator,
Basingstoke

Extralevator,
Hull

# Dresden, Germany: Conventional vs Extralevator APR

| Case series | Conventional | Extralevator |
|---|---|---|
| 1997 - 2010 | N = 46 | N = 28 |
| Perforation | 15.2% | 0% |
| P < 0.04 | | |
| CRM pos | 0% | 4.9% |
| P = 0.51 | | |

Stelzner, Int J Colorectal Dis 2011; 26: 919

# Leeds + 11 European centres: Conventional vs Extralevator APR

| Case series 2008 | Conventional N = 124 | Extralevator N = 176 |
|---|---|---|
| Perforation P < 0.025 | 28.2% | 8.2% |
| CRM pos P < 0.0001 | 49.6% | 20.3% |

West, Br J Surg 2010; 97: 588

# Cleveland Clinic: Lithotomy vs Prone APR

| Case series | Lithotomy | Prone |
|---|---|---|
| 1997 - 2007 | N = 87 | N = 81 |
| Perforation | 1.2% | 0% |
| P = 1 | | |
| CRM pos | 8.5% | 2.3% |
| P = 0.17 | | |

De Campos-Lobato, DCR 2011; 54: 8

# Rochester, NY : Lithotomy vs Prone APR

| Case series | Lithotomy | Prone |
|---|---|---|
| 1999 - 2008 | N = 63 | N = 58 |
| Perforation | 5.0% | 3.4% |
| P = 0.55 | | |
| CRM pos | 27.0% | 27.6% |
| P = 0.5 | | |

Tayyab, DCR 2012; 55: 3

# Toronto Mt Sinai, case series1997-2006: Conventional lithothomy APR

- 115 patients
- Perforation: 6.1%
- CMR pos
  - Anterior: 31.6%
  - Lateral: 13%
  - Posterior: 10%
- LR 10.6%

Messenger, DCR 2011; 54: 793

# Beijing RCT: Conventional vs Extralevator APR

| RCT | Lithotomy | Prone |
|---|---|---|
| 2008-2010 | N = 32 | N = 35 |
| Perforation | 5 (16%) | 2 (6%) |
| P < 0.246 | | |
| CRM pos | 9 (28%) | 2 (6%) |
| P < 0.013 | | |
| Local recurrence (29 months) | 6 (19%) | 1 (3%) |
| P < 0.048 | | |

Han, Am J Surg 2012; 204: 274

# Summary - Extralevator APR (prone)

- Wider lateral margin clearance at levators
- Possibly
  - Less perforation (especially anterior)
  - Decreased pos CMR (especially anterior)
  - Decreased local recurrence

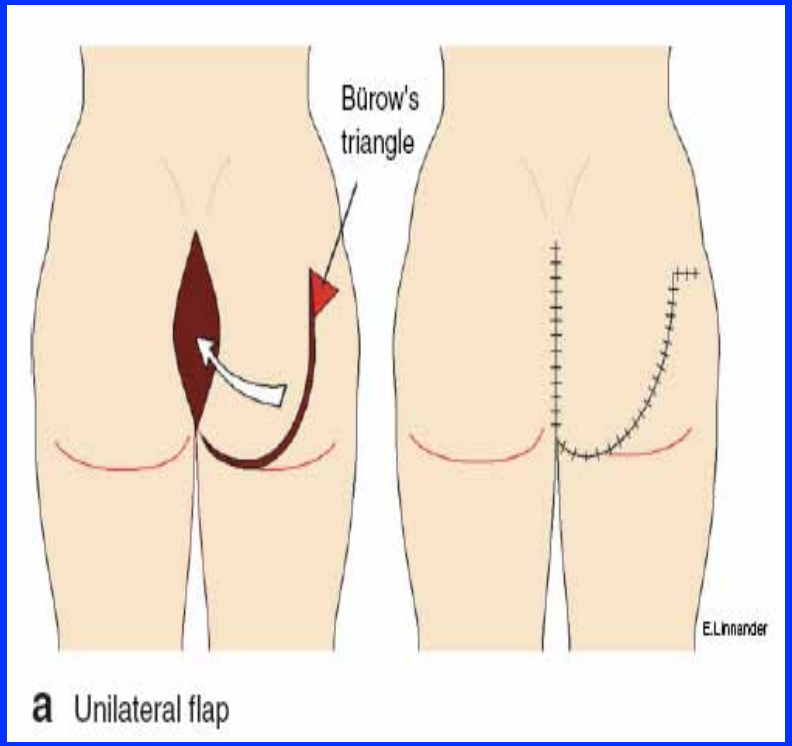
# Summary: Prone vs Lithotomy

- No definitive large RCT as yet
- Europeans favouring prone extralevator APR
- North Americans defending lithotomy

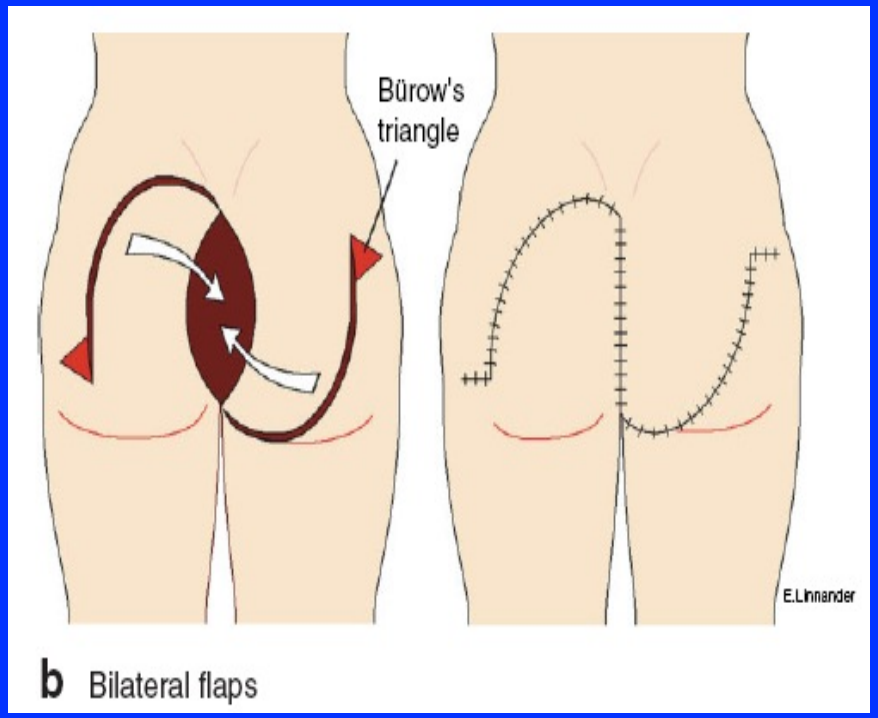
# Reconstruction Options

- Rotation / advancement flaps
  - Gluteus, gracilis, rectus
- Free flaps
  - Latissimus
- Mesh
  - Prolene / PTFE (Goretex)
  - Biologic
  - Vicryl

# Reconstruction - Gluteus maximus flaps




a Unilateral flap

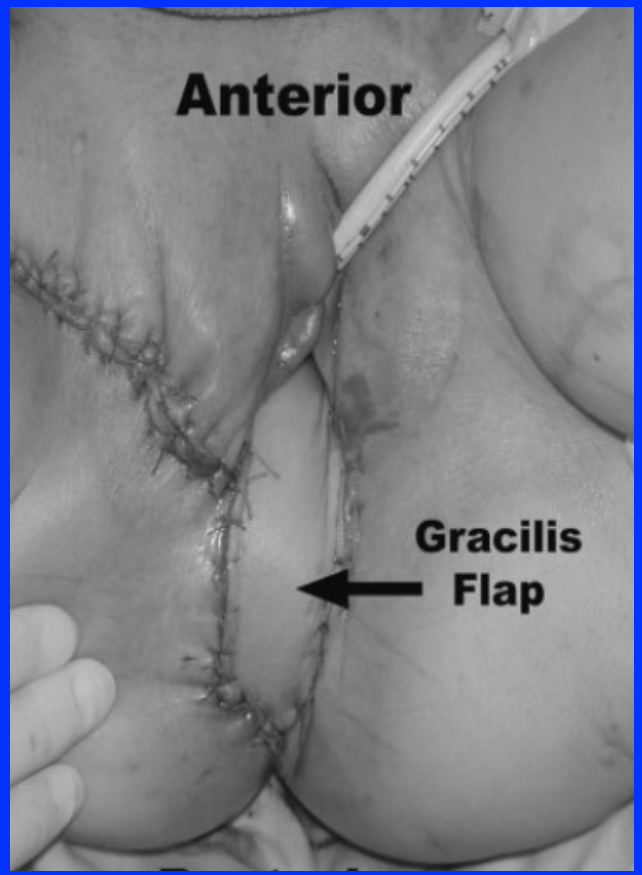



b Bilateral flaps

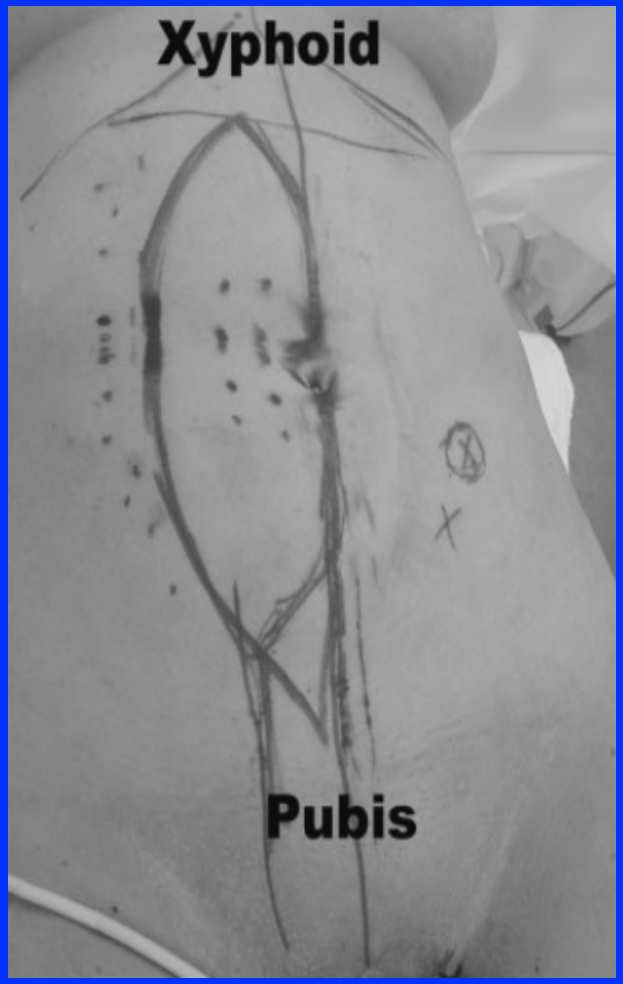
Holm et al. Br J Surg 2007; 94: 232

# Gluteal Advancement Flaps

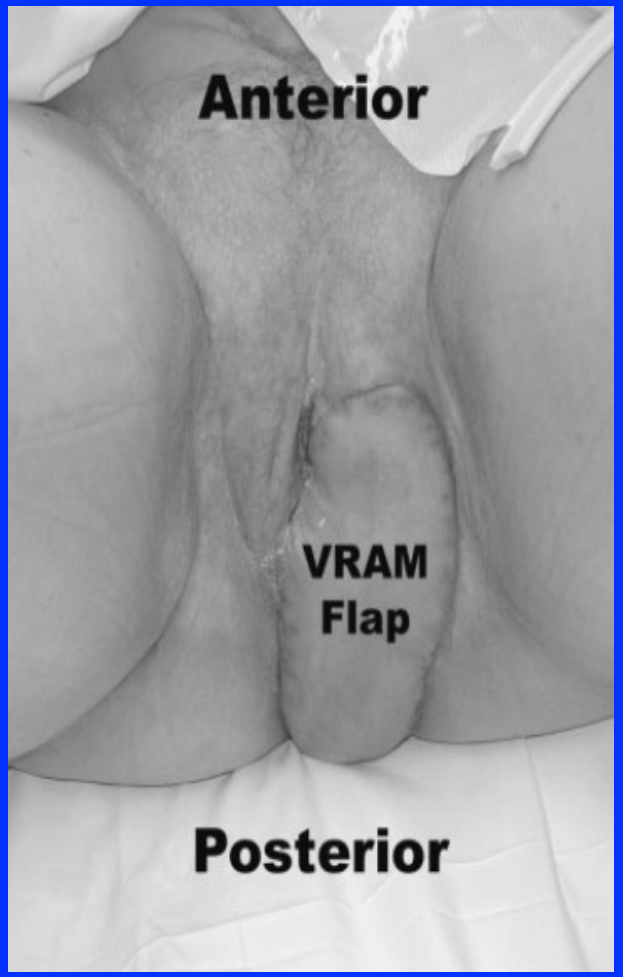
# Gracilis rotation flap

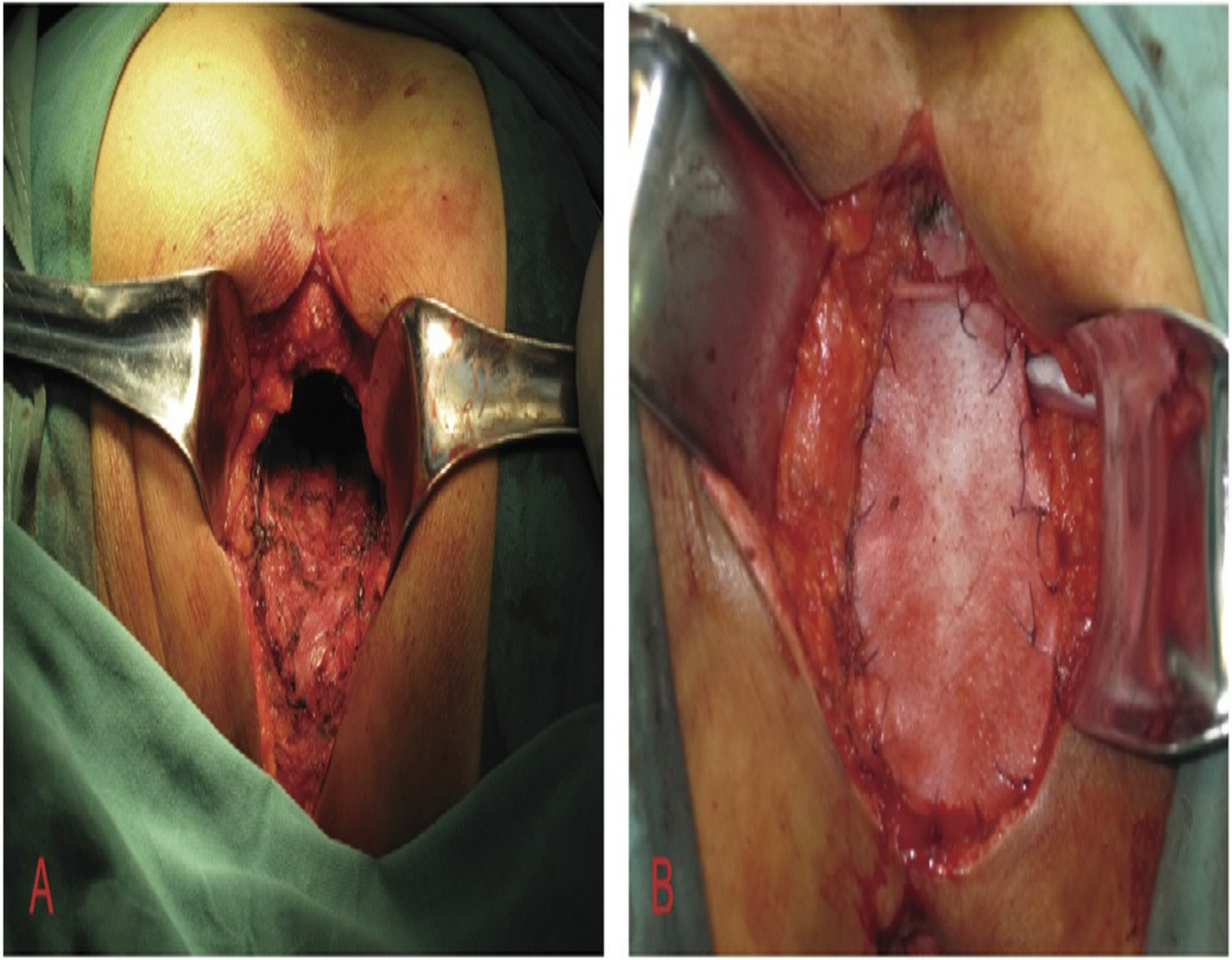



# Rectus abdominus rotation flap








A
B

# Personal observations (no data)

- Prone
  - Pros: Improved visibility, easier retraction by assistant
  - Cons: Unable to perform rectus or gracilis transfer
    - Use biologic mesh ± gluteus advancement

# Prone vs Lithotomy: Recommendation

- TRY PRONE !!!