

# Posterior Urethral Complications of the Treatment of Prostate Cancer

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# Problems

- Erectile Dysfunction
  - Sphincter Weakness Incontinence
  - Bulbo-Membranous Urethral Stricture
- Bladder Neck/Prostatic Urethral Contracture
  - Uro-Rectal and Uro-Symphyseal Fistula

# Two Separate Issues

- Anterior urethral strictures
- Posterior urethral or bladder neck contractures

# Two Different Treatments

- Radical prostatectomy
- Radiotherapy (and other 'energy' sources)

# Strictures following Radical Prostatectomy

- Incidence unknown (0.4-32%) – terminology: stricture v contracture
  - 1.5-3.8% after TURP
  - Usually present within 3 months of surgery
    - Usually short
  - Usually respond to instrumentation

(various authors)

# Irradiation Strictures

## Reported Incidence

2-12% incidence

(Wallner et al, 1996; Zelefsky et al, 1999; Sarozdy, 2004)

Incidence increases with time after treatment

(Merrick et al, 2005; Elliott et al, 2006)

# Urethroplasty for Irradiation Strictures

## Described Characteristics

### **Presentation**

‘obstructive symptoms’

### **Length**

1.5-7cm (mean 2.9) (Meeks et al, 2011)

2.6±1.6cm (Glass et al, 2012)

### **Location**

‘in the proximal bulbar or membranous urethra’

# Urethroplasty for Irradiation Strictures

## Reported Results

- Meeks et al, 2011
  - 73% success (22/30) at 21 (19-69) months
  - 25/30 anastomotic
- Glass et al, 2012
  - 90% success (26/29) at 40 (12-83) months
  - 22/29 anastomotic

# Our Experience



# Strictures after Radical Prostatectomy

## Our Experience

19 patients with bulbar strictures  
(i.e. not catheter strictures or bladder neck contractures)

Onset 3-13 weeks

Voiding difficulty in all; no retention

2-17mm long

No obliteration

Patch repair in all

Failure 3/19 (16%)

# Irradiation Strictures

## Our Experience

9 patients with bulbar strictures

(i.e. not catheter strictures or bladder neck contractures)

Onset 13-27 months

Retention in 6/9

11-60mm long

5 obliterative

2 EPA repairs – both failed

7 patch repairs – 1/7 failed

# Irradiation Strictures

## Our Experience

### Treatment by Instrumentation

45% are on CISC

45% use an indwelling catheter

-

Only a minority are suitable for surgery:-

- the state of the bladder and sphincter
  - co-morbidities
- rather than the nature of the stricture

# Issues

- Where exactly is the stricture?
- What is the most likely cause?
  - How long is it?
- What else is involved? The sphincter? The bladder?

THEN

- How should it be treated?

# Types of Stricture

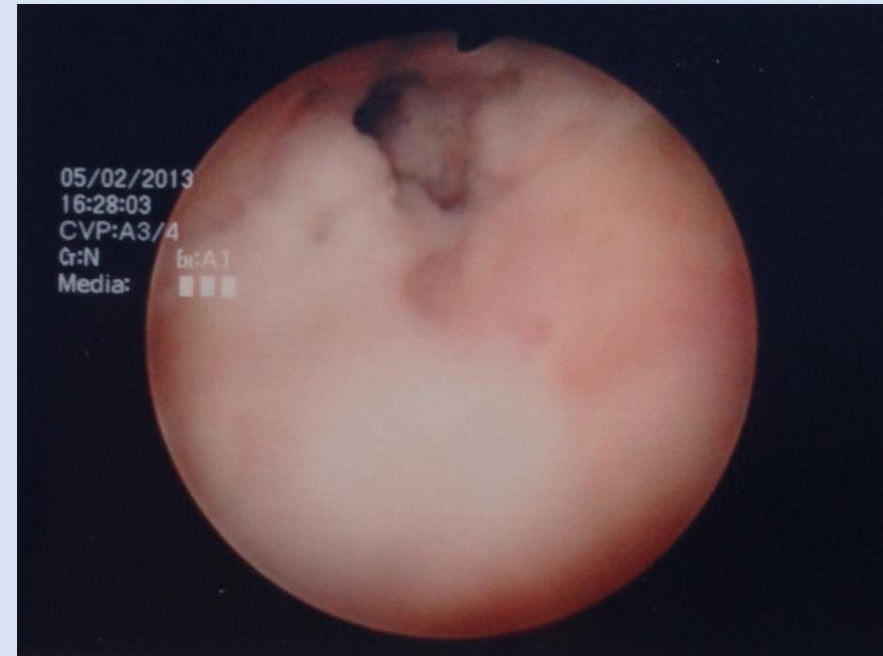
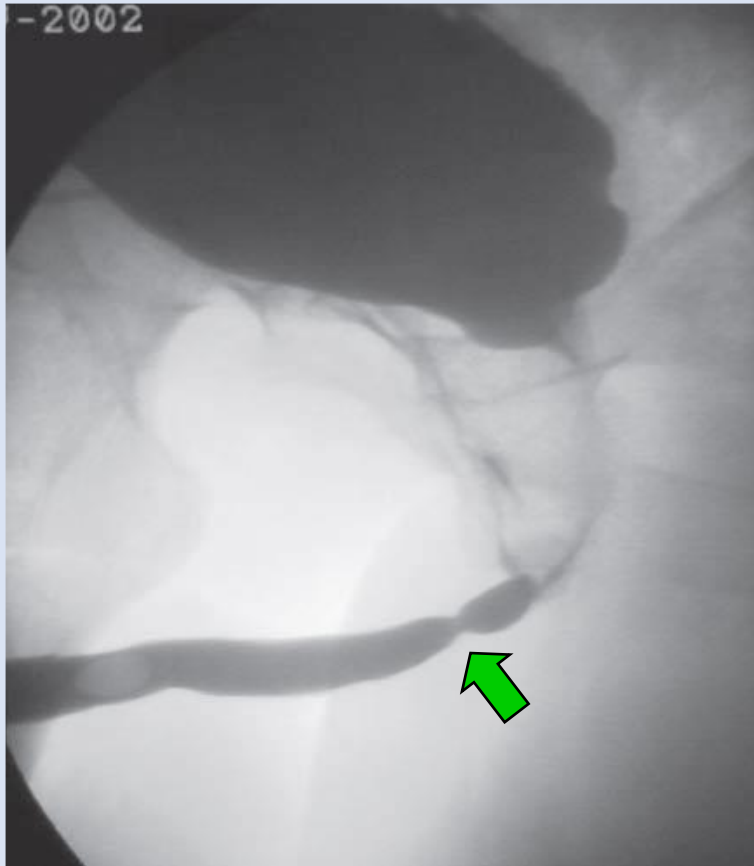
- Instrumentation stricture of the meatus
- Instrumentation stricture of the sphincter
- Catheter stricture of the bulbar (bulbo-penile) urethra
  - Age related stricture
  - Stricture related to hormonal therapy

.....irrespective of radiotherapy

.....and without a biopsy the diagnosis of an irradiation stricture is presumptive

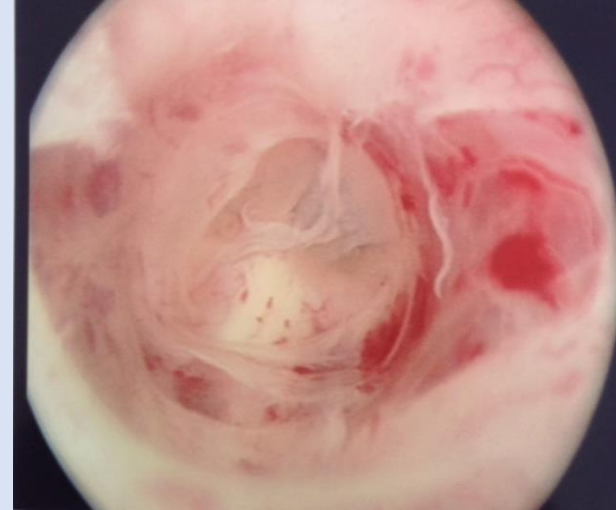
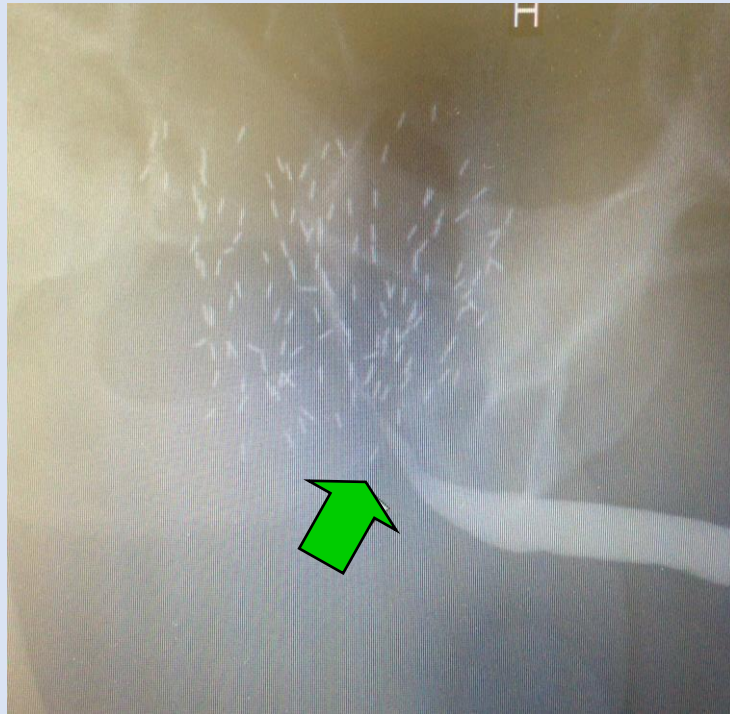
# Post-Irradiation Stricture

Length, Location and Nature

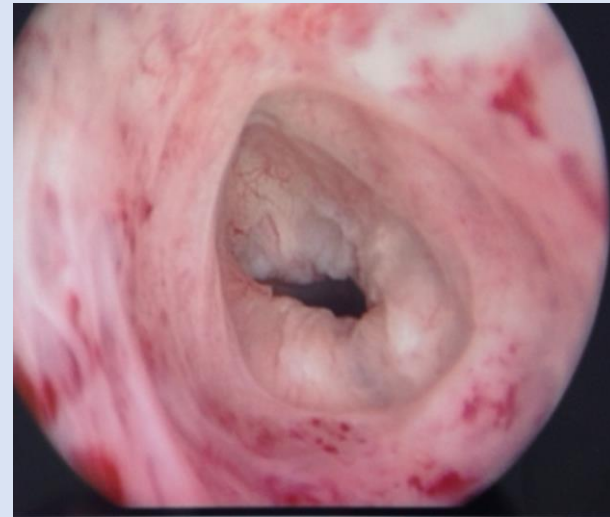


# Post-Brachytherapy Stricture

Length, Location and Nature



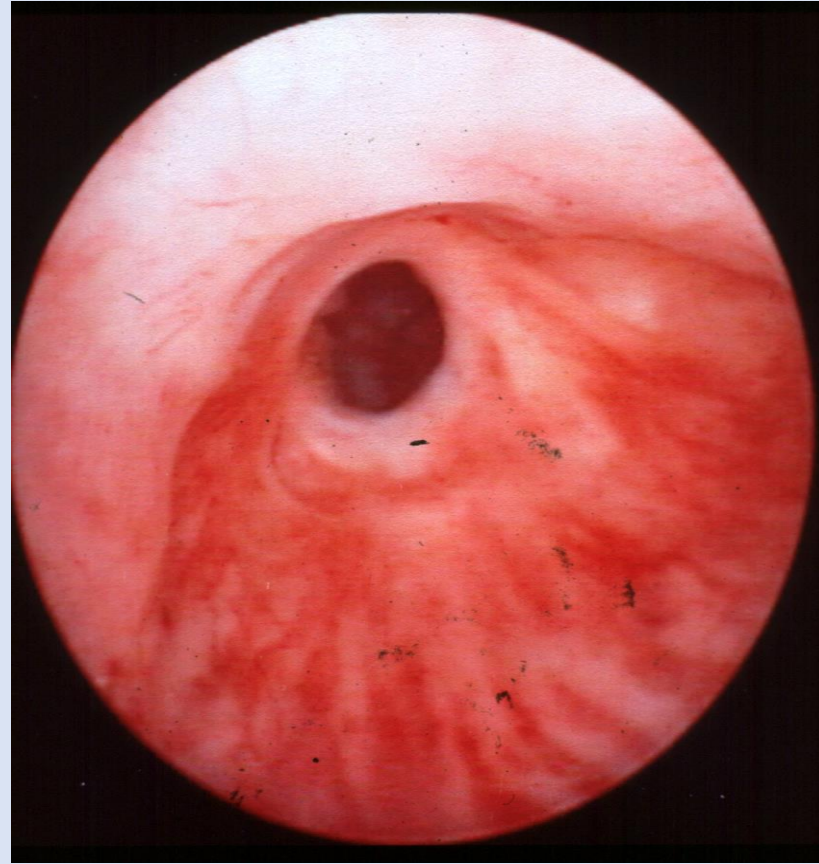
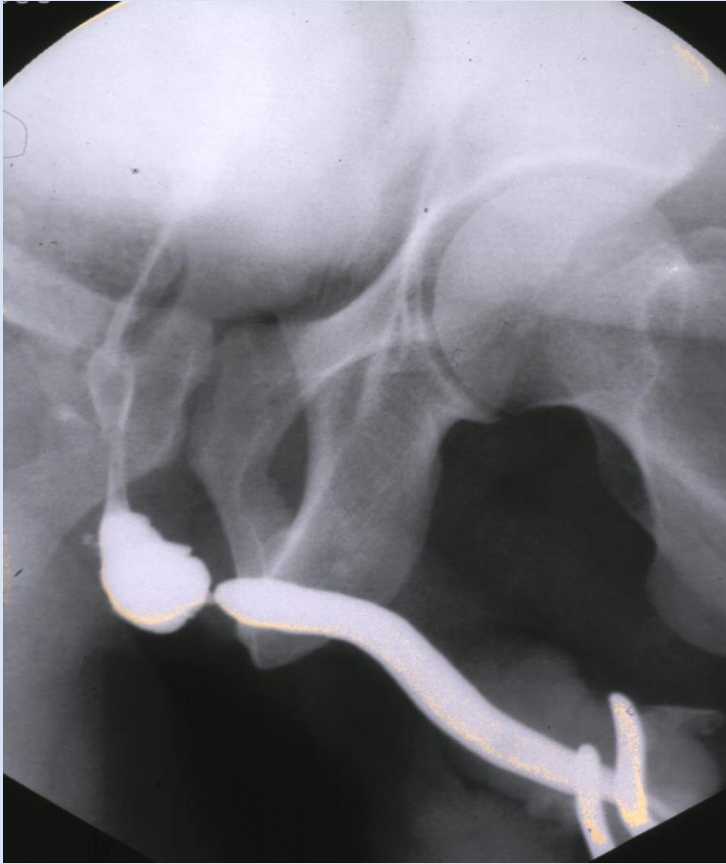
# Is This an Irradiation Stricture?



.....or a stricture in a patient who has had radiotherapy?



# Is This an Irradiation Stricture?

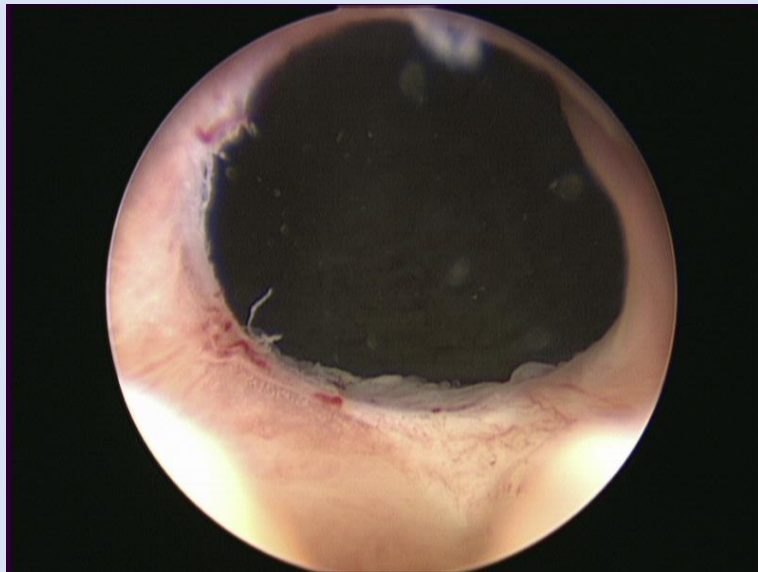
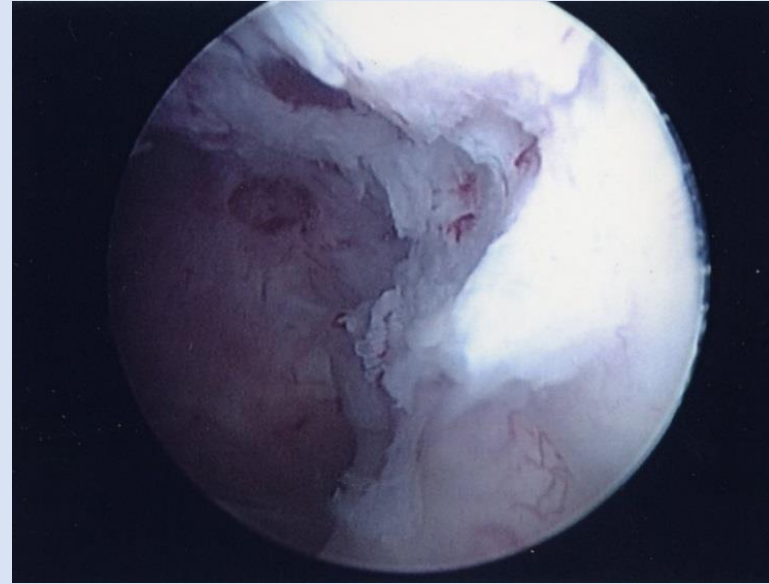
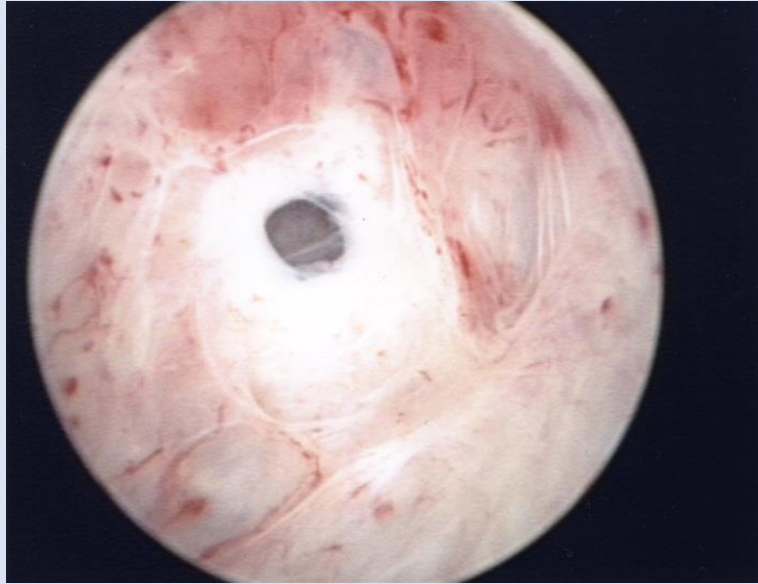


.....or a stricture in a patient who has had radiotherapy?

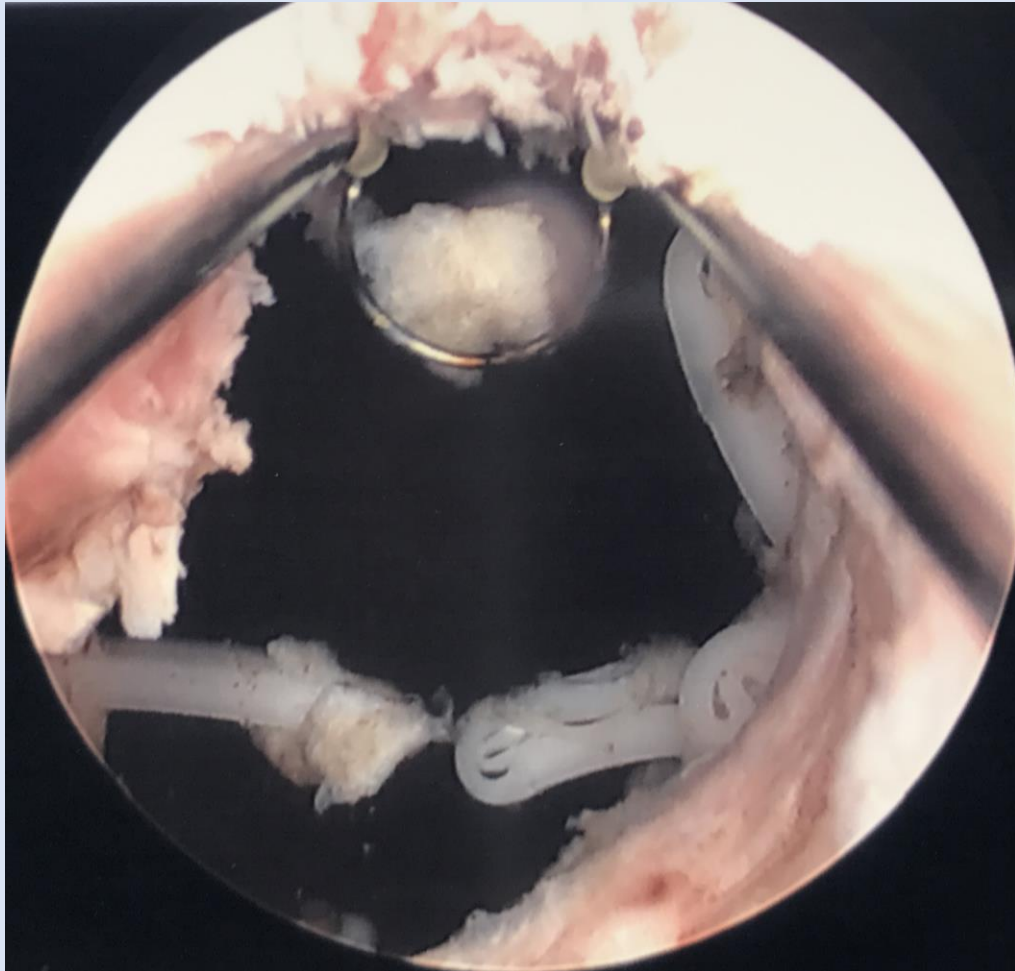
# Conclusions

- These are nasty strictures – when they are irradiation strictures
  - CISC suits many patients
- Urethroplasty – in our view – is of limited value except in carefully selected patients
- The urethra is not the only problem; the sphincter and bladder are just as important

# Bladder Neck Contracture



# I Hate Clips!



# Treatment by TUR 2008-2012

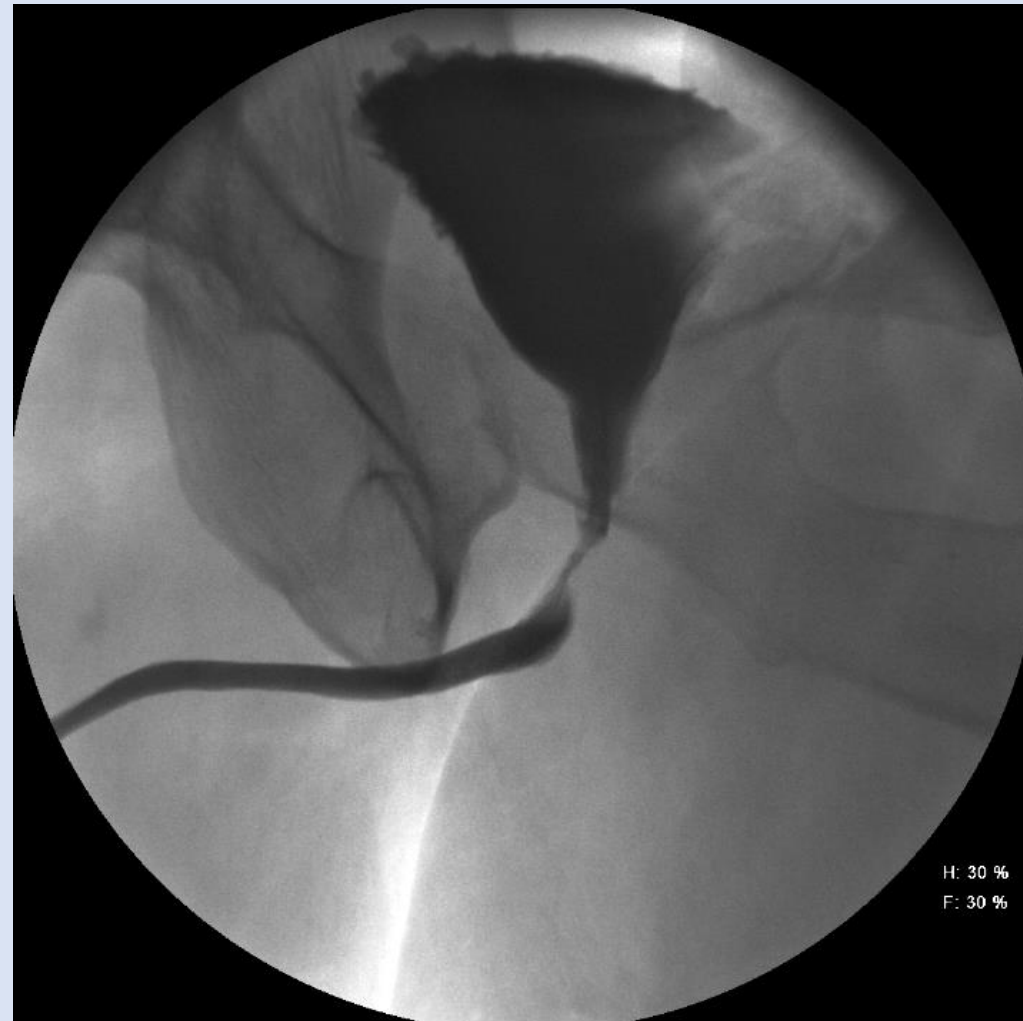
27 in 17 patients with no salvage EBRT

- Once in 12 patients
    - 9 had subsequent AUS
    - 3 lost to follow up
  - Twice in 4 patients
  - Thrice in 1 patient
- } -all failed

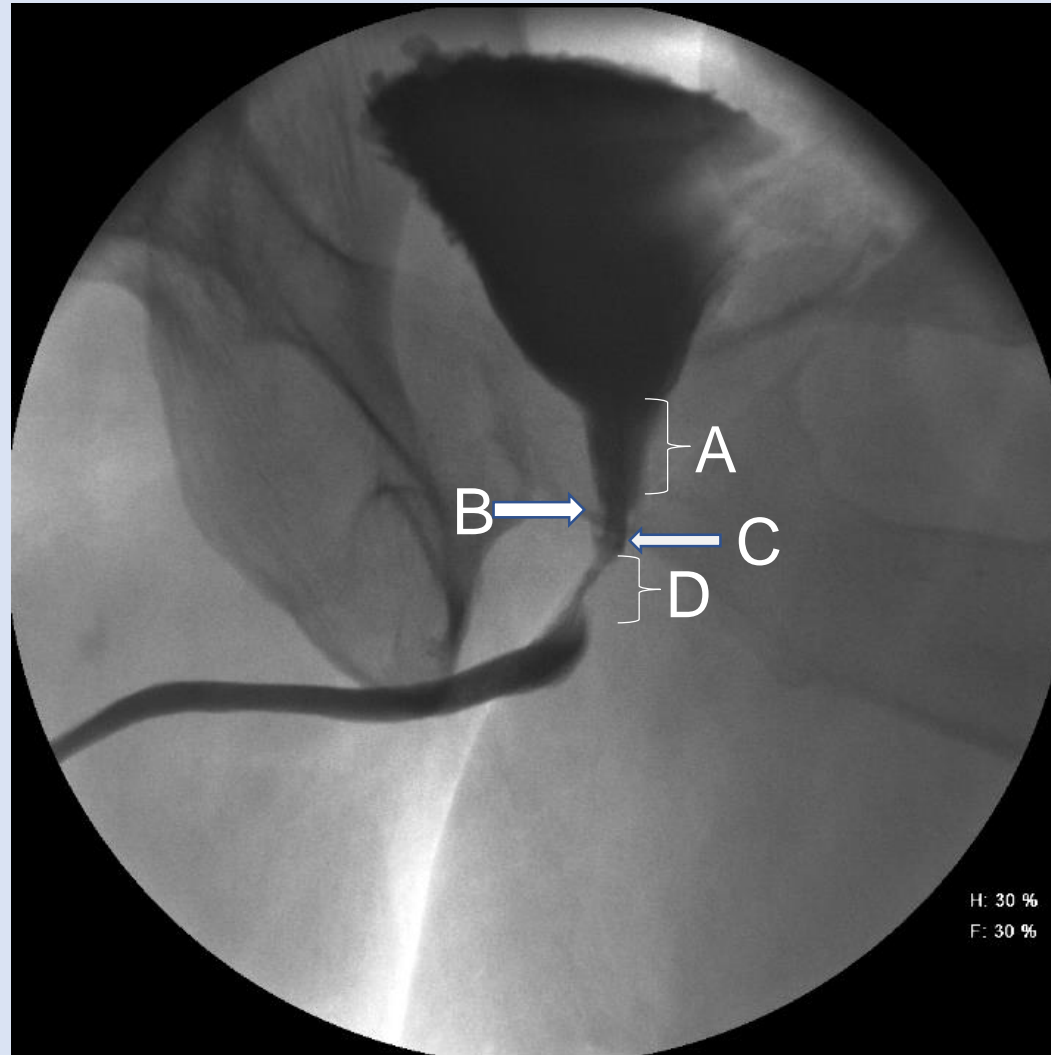
16 in 9 patients with salvage EBRT

- Once in 2 patients
- Twice in 7 patients – all failed

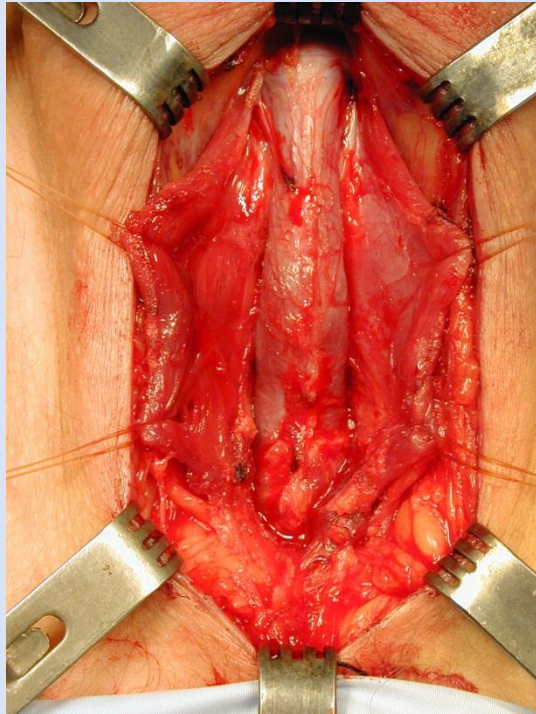
# Bladder Neck Contracture after a Radical Prostatectomy



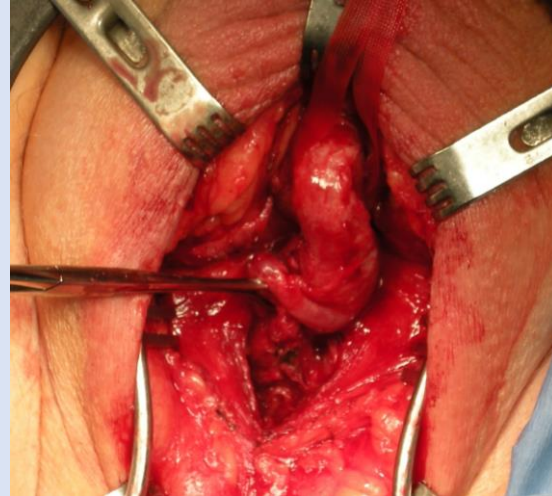
# The Anatomy after Radical Prostatectomy



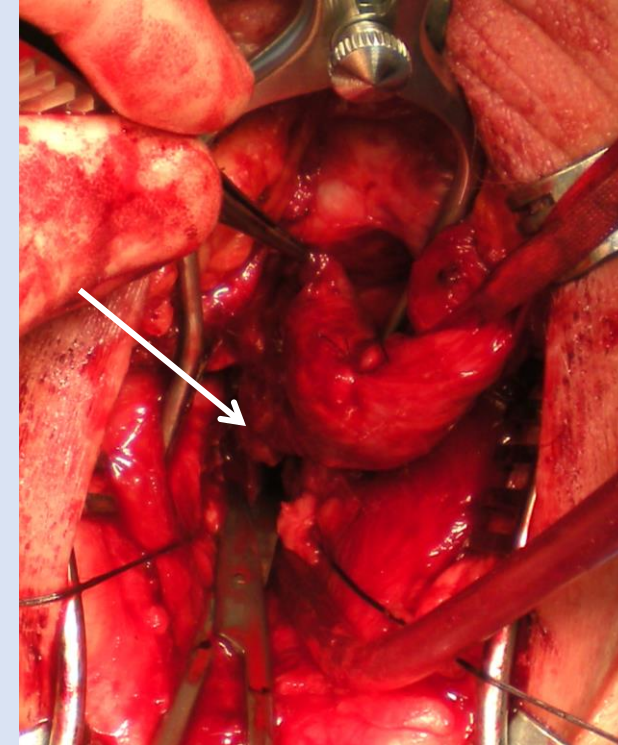
# Transperineal Redo Vesico-Urethral Anastomosis



Bulbar urethra exposed



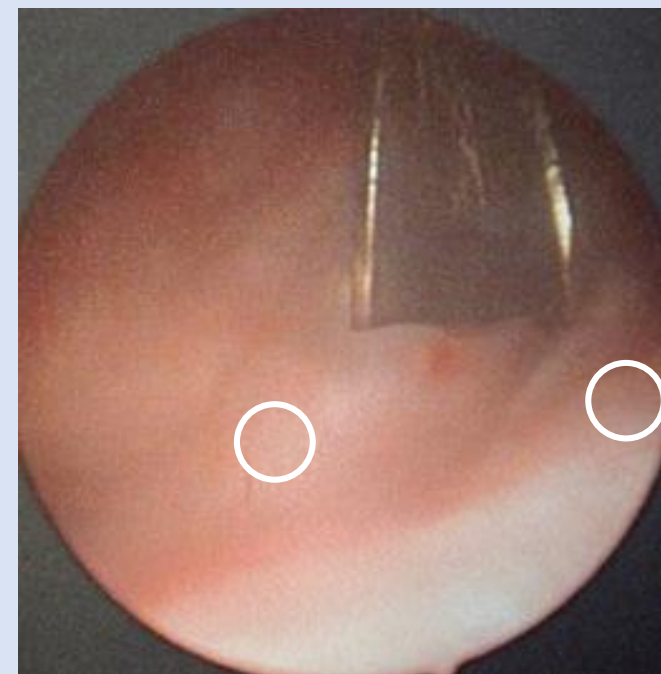
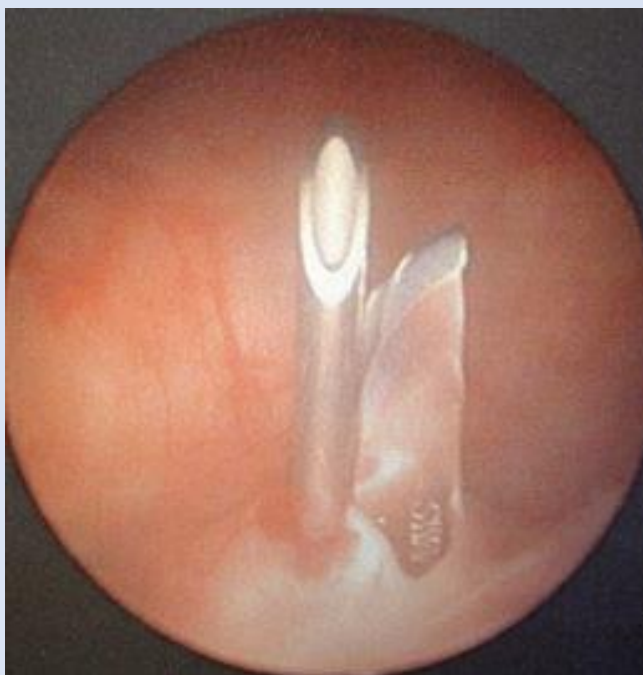
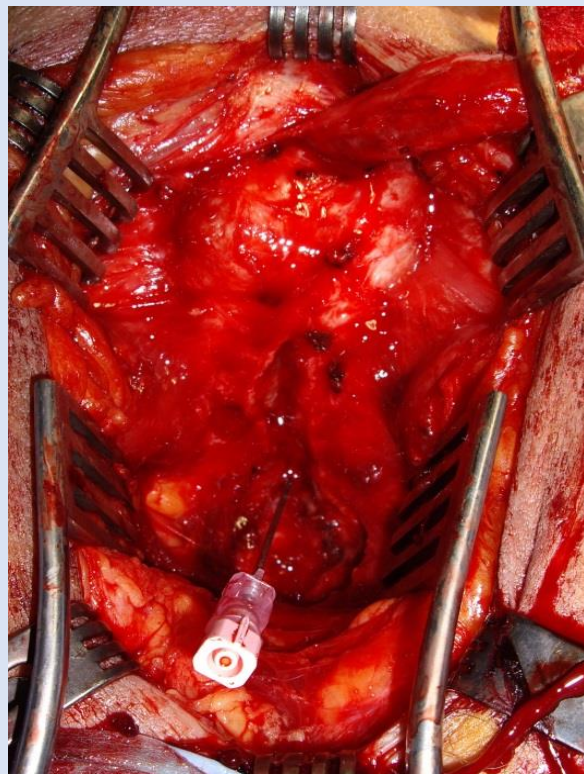
Bulbar urethra mobilised  
proximally from the  
perineal body



Urethra transected at the  
level of obstruction

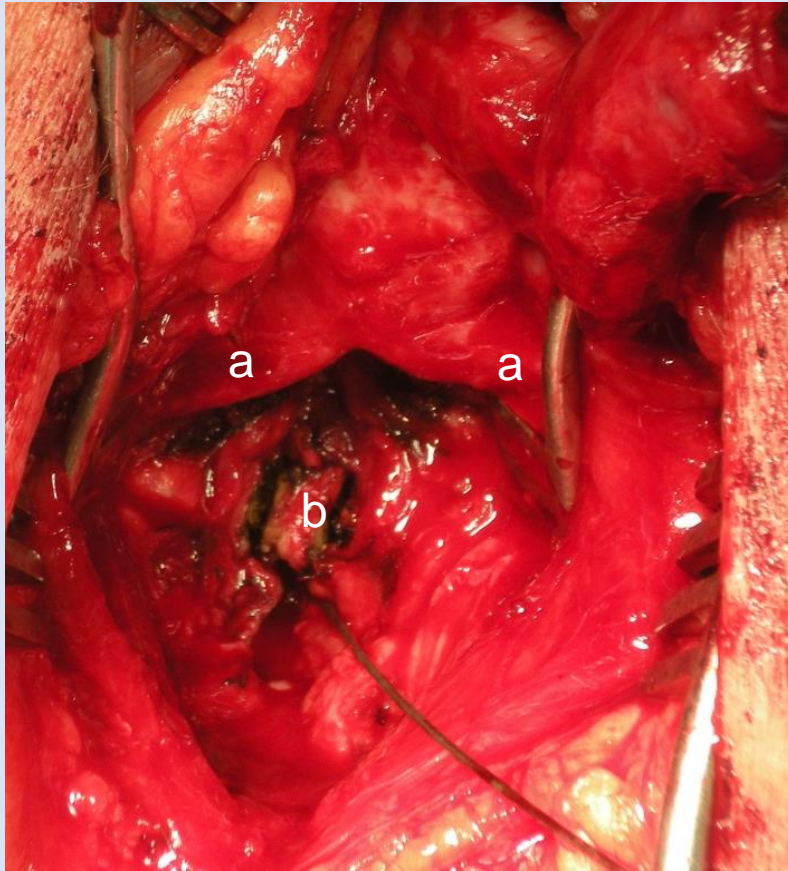


# Transperineal Redo Vesico-Urethral Anastomosis

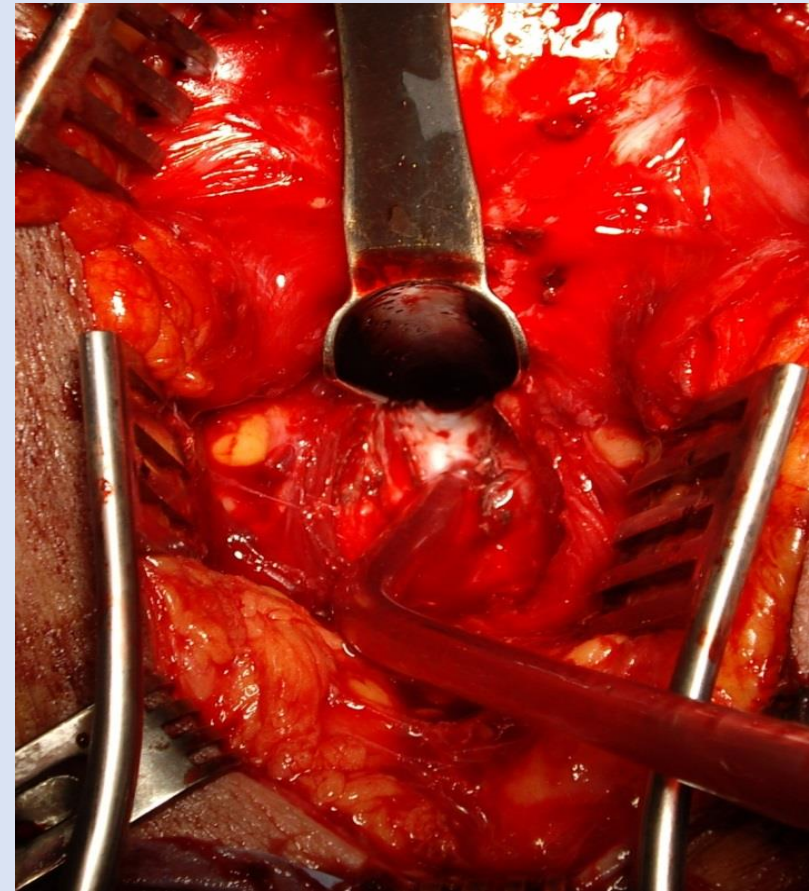


Identifying the correct position for the bladder neck if it is an obliterative contracture.

# Transperineal Redo Vesico-Urethral Anastomosis

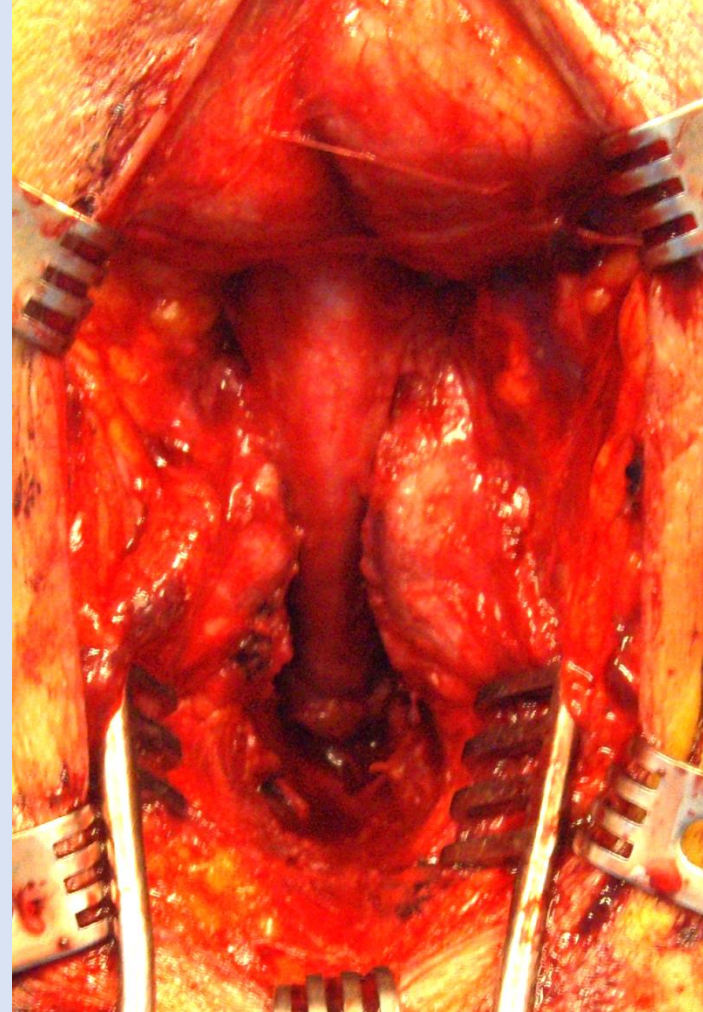


Corporal separation (a) and inferior wedge pubectomy (b) to improve access and allow tension-free anastomosis



Excision of the fibrotic block until a healthy bladder neck is defined

# Transperineal Redo Vesico-Urethral Anastomosis



Tension-free anastomosis

# Bladder Neck/Prostatic Urethral Contracture 2008-2017

## RRP

52 patients  
52 repaired  
49 - 1° success  
3 - 2° success  
52/52 success  
All → AUS  
All dry & voiding\*  
**88 → 100%**

## RRP+EBRT

18 patients  
18 repaired  
13 success  
5 failures  
13/18 success  
12/13 → AUS  
Dry and voiding\*  
**67% D&V; 72%V\***

## RT

15 patients  
15 salvage RRP  
10 success  
5 failures  
10/15 success  
Dry and voiding\*  
**67%**

# Bladder Neck/Prostatic Urethral Contracture

## Outcomes

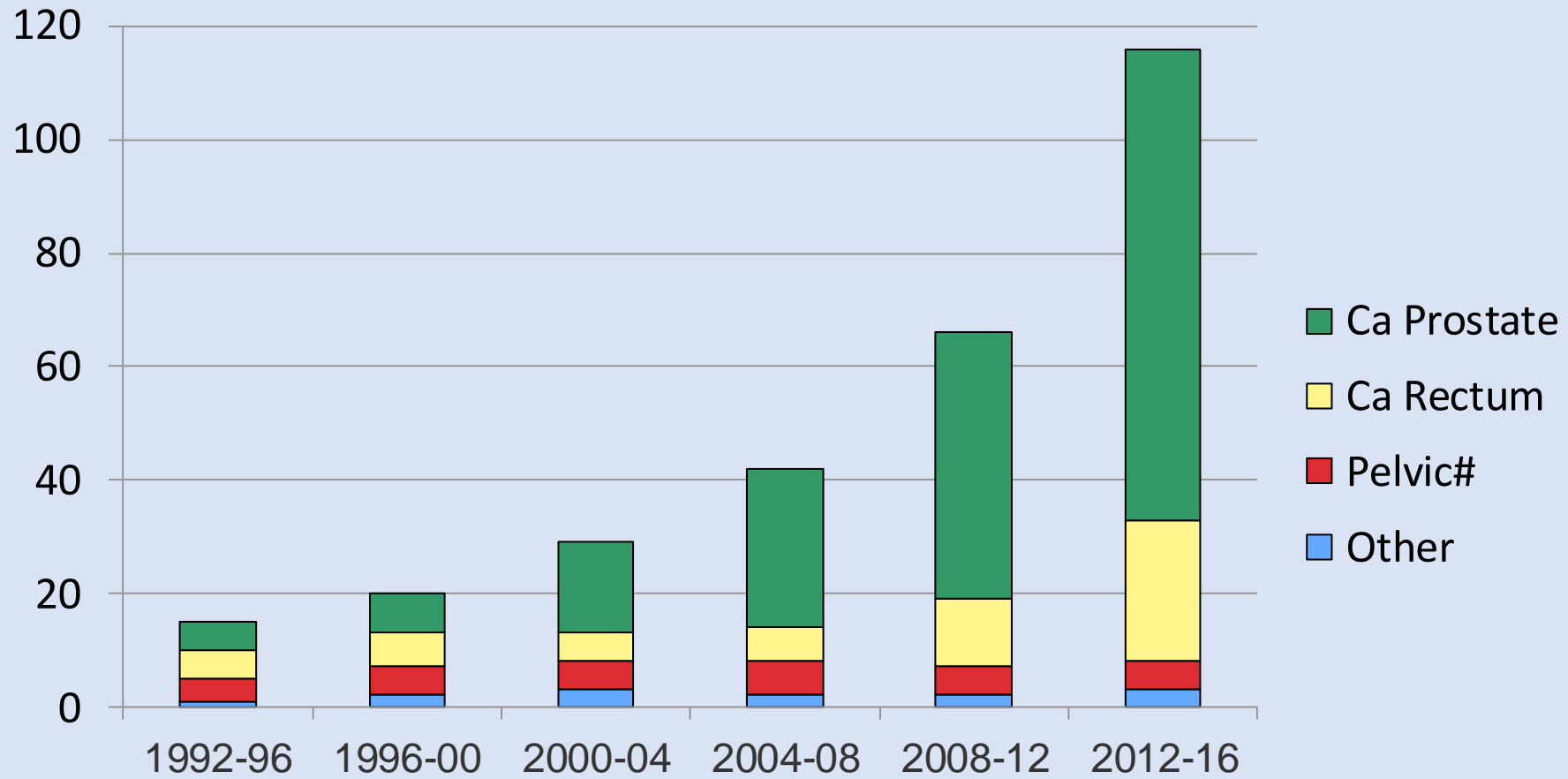
	Surgery	RT
In Patient Stay	4.5d	9.5d
Out Patient Recovery	3w	9w
Degree of Functional Recovery	90%*	65%

# Bladder Neck Contractures

## Conclusions

- The best treatment for patients with recalcitrant BNC is open surgical reconstruction
  - The only curative treatment
- 100% success rate following RP but a two-staged procedure
- BNC after irradiation, HIFU or Cryo are more complex and difficult to treat. Bladder capacity\* is critical

# The New Epidemic - Complications of Treating Pelvic Cancer



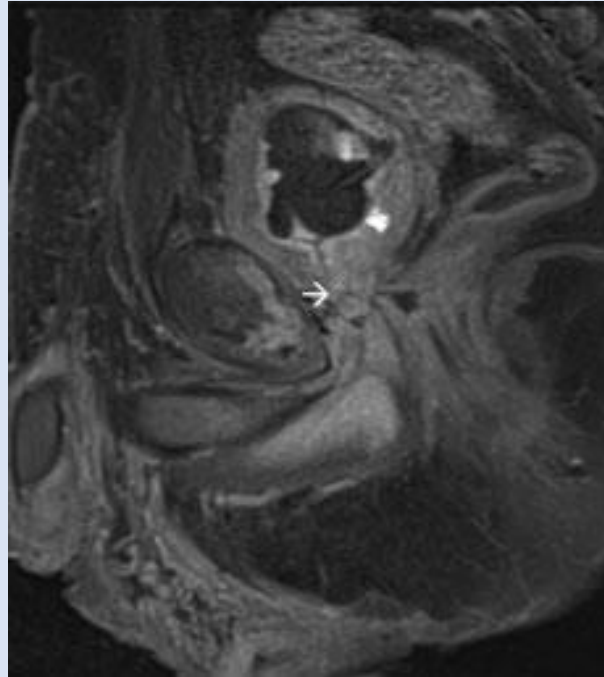
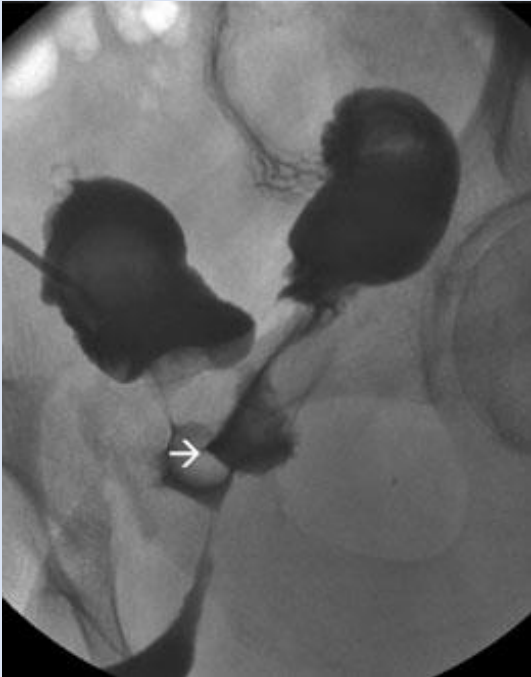
## Uro-Rectal Fistulae in Men

# Prostate Cancer Patients and Procedures

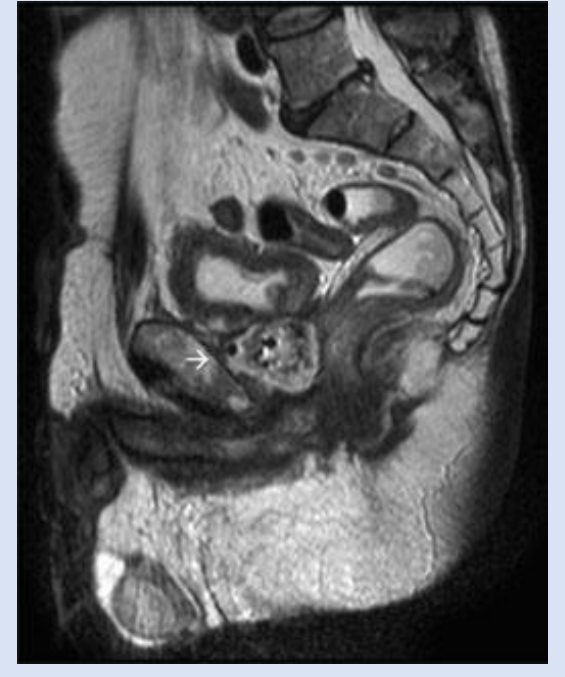
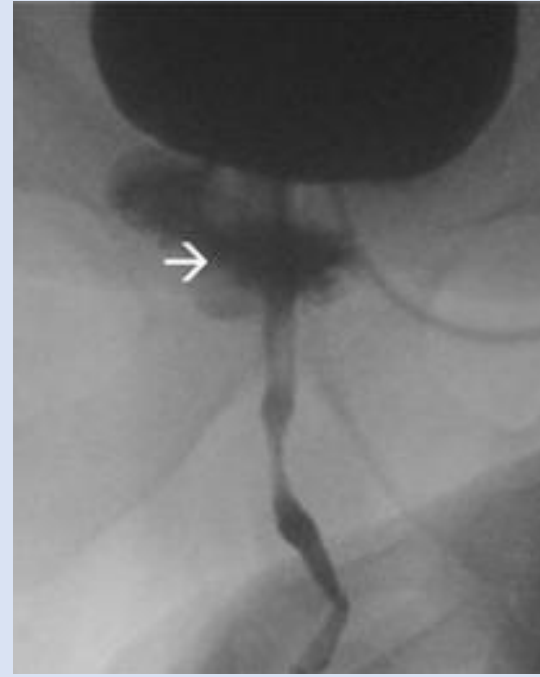
- 147 patients with a URF between 2006-2016
  - Minimum follow up 1 year
- 24 died or lost to follow-up so 123 evaluable
  - 
  - Transperineal approach 88 (60%)
  - Abdomino-perineal approach 59 (40%)
    - High fistula
    - Unusually large fistula
      - Cavitation
    - Pre-sacral sepsis
  - (Other) radiotherapy-related complications
    - Omental wrapping



# Uro-Rectal Fistula

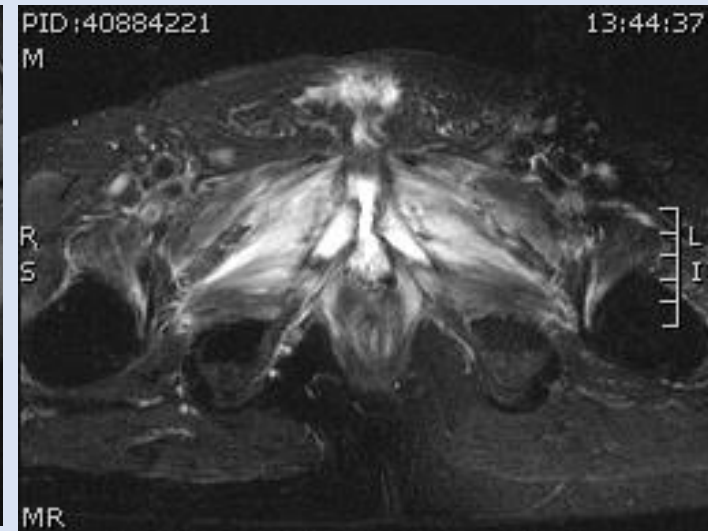
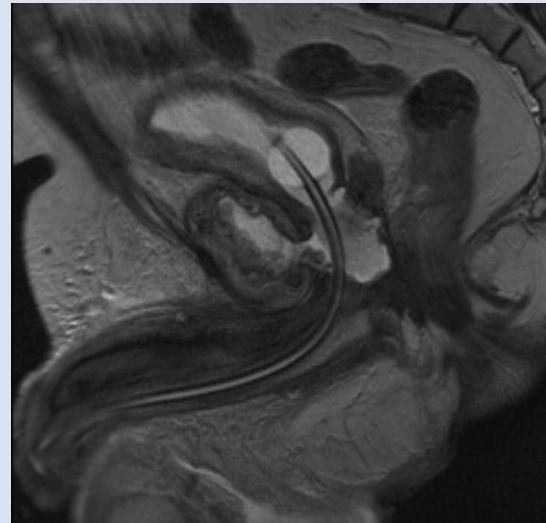


Type 1  
Direct



Type 2  
Cavitating

# Uro-Symphyseal Fistula



Cavitating into the pelvis and beyond

# Classification Of Urinary Fistulae Following the Treatment of Prostate Cancer (147 Patients)

	Incidence	Reconstructability
Type 1a Direct Post-Surgical	52 (35%)	100%
Type 1b Direct Post-Irradiation	46 (31%)	88%
Type 2a Cavitating Post-Surgical	4 (3%)	100%
Type 2b Cavitating into the rectum Post-Irradiation	8 (6%)	63%
Type 2c Cavitating into the pelvis Post-Irradiation	37 (25%)	24%

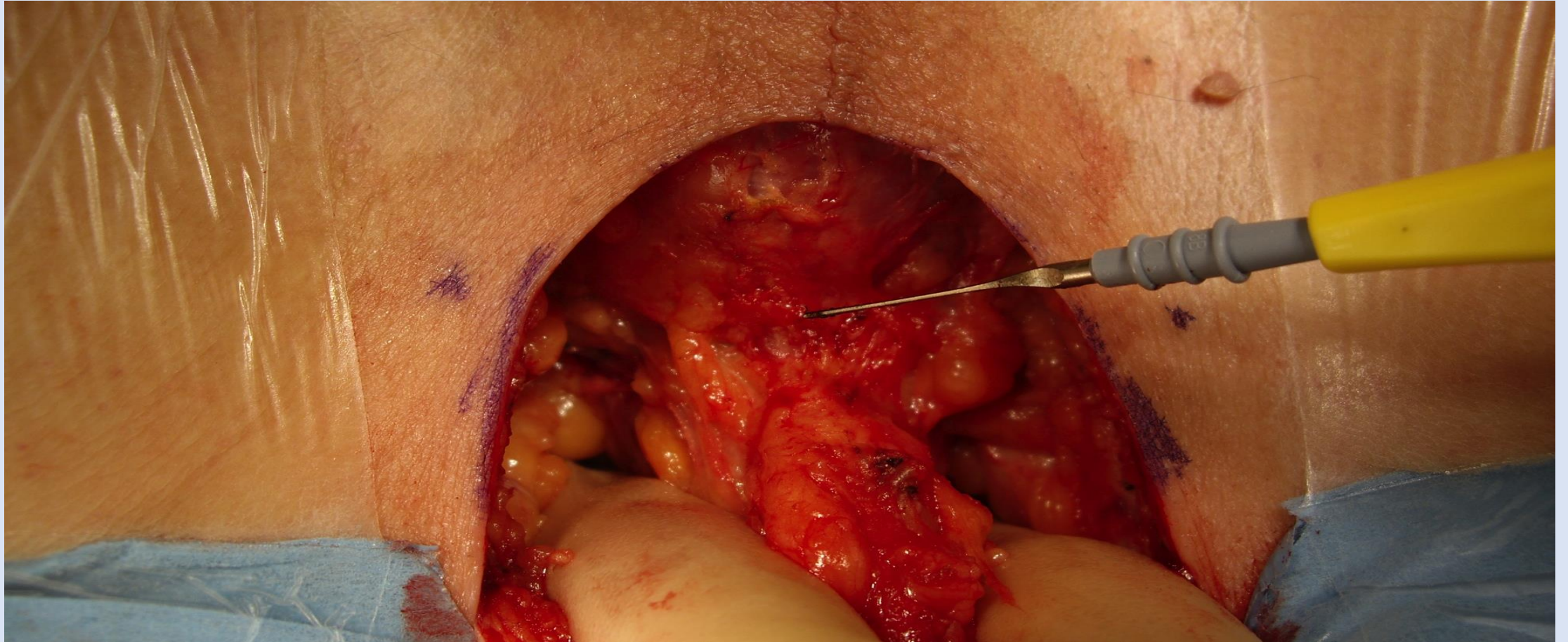
# Technique 1



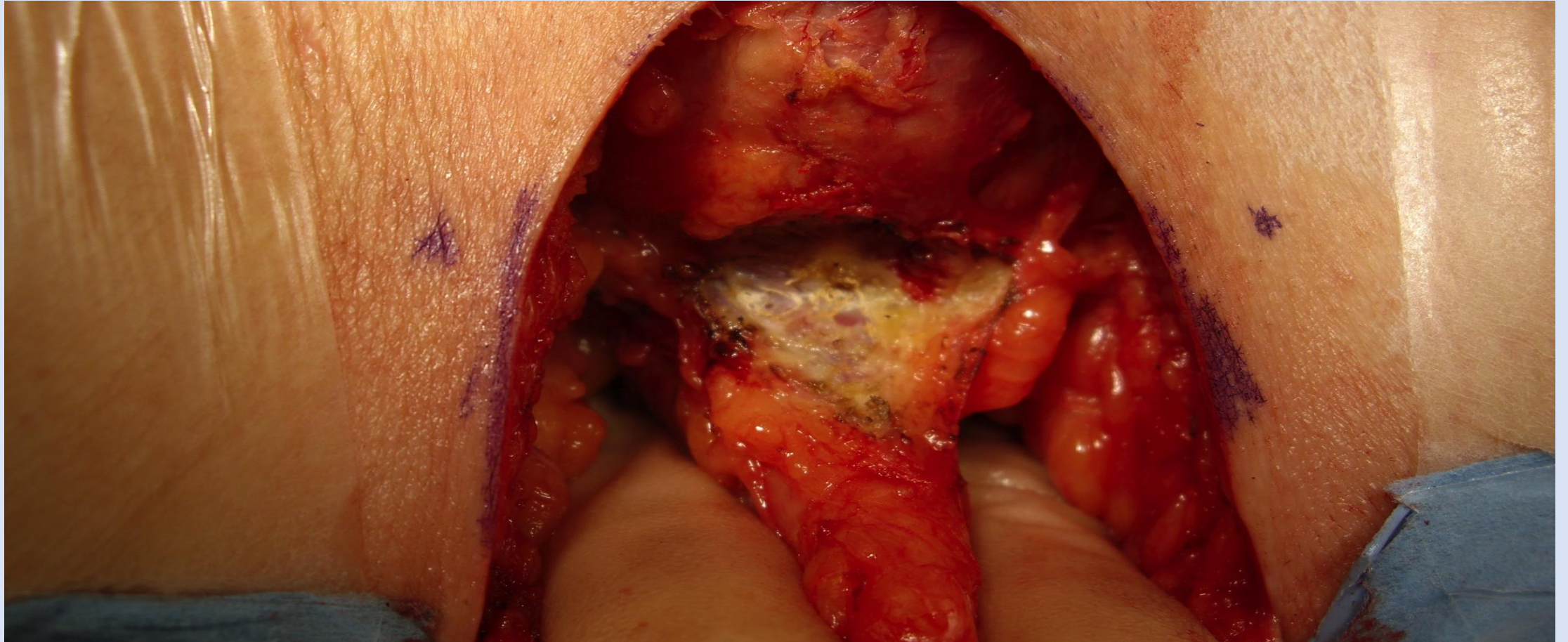
# Technique 2



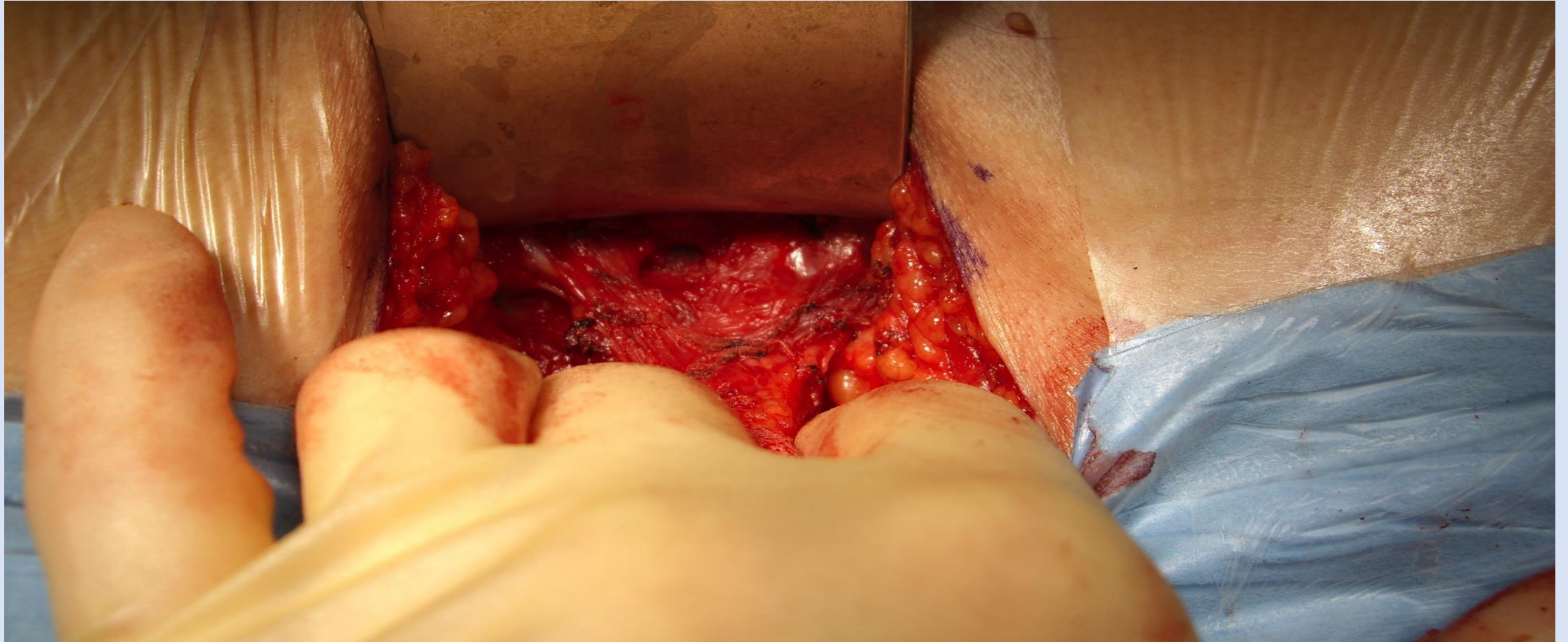
# Technique 3



# Technique 4

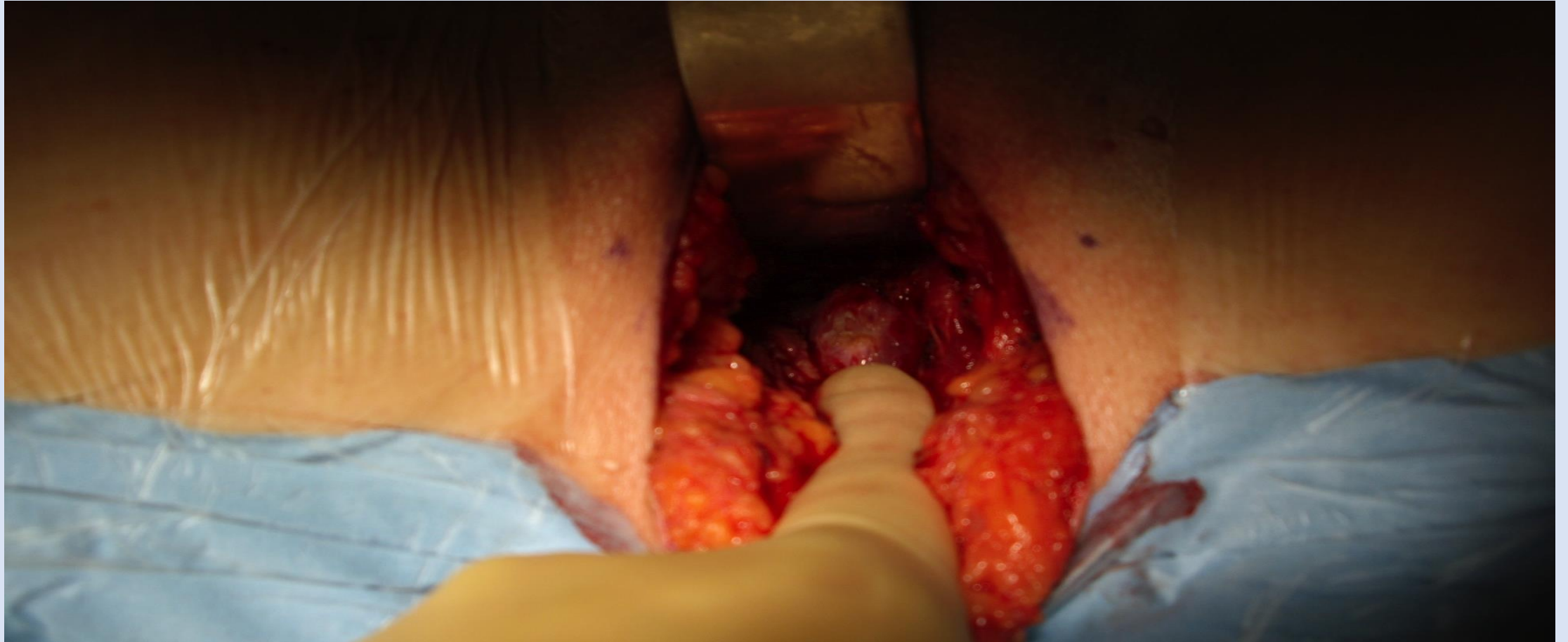


# Technique 5

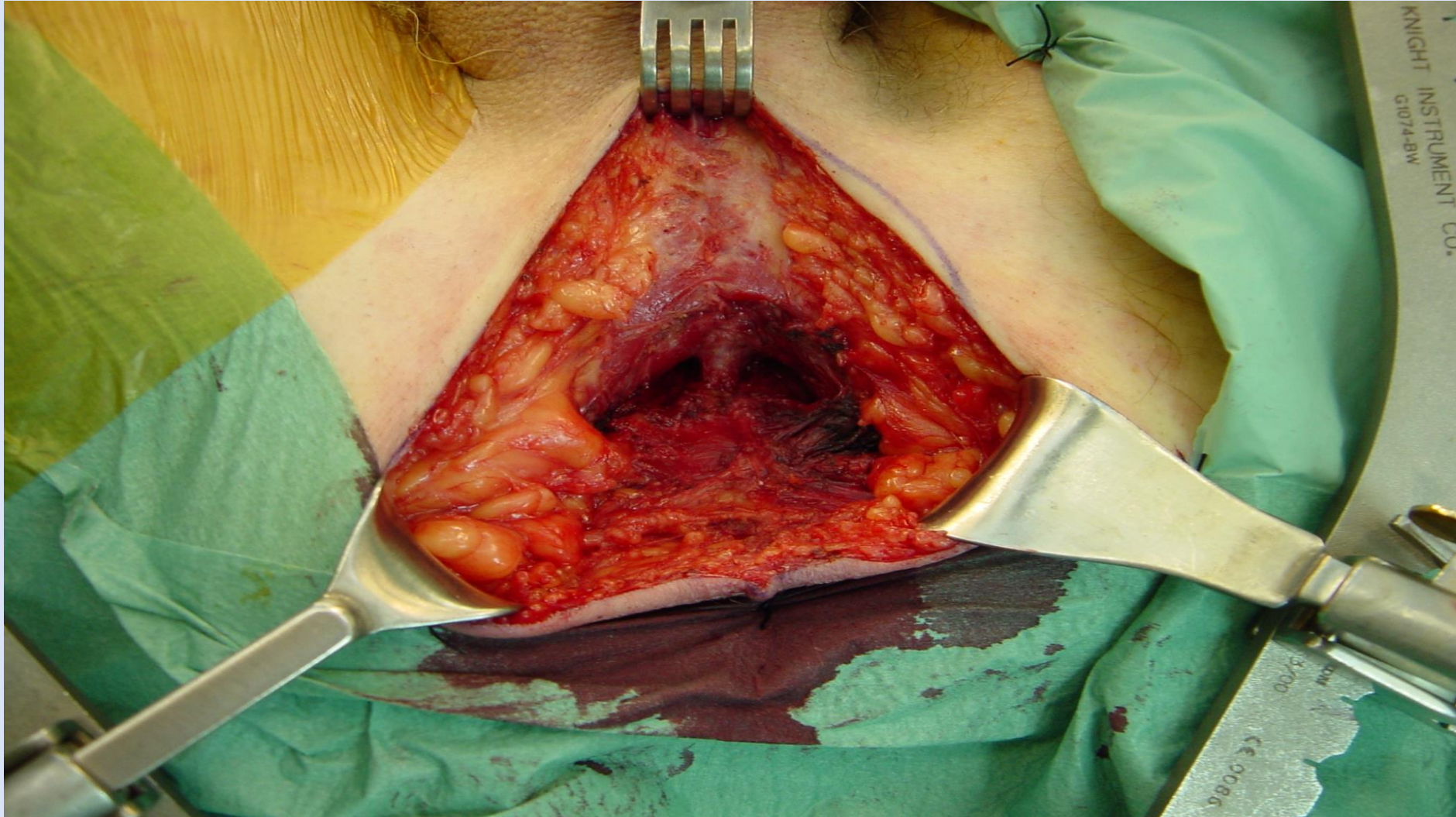




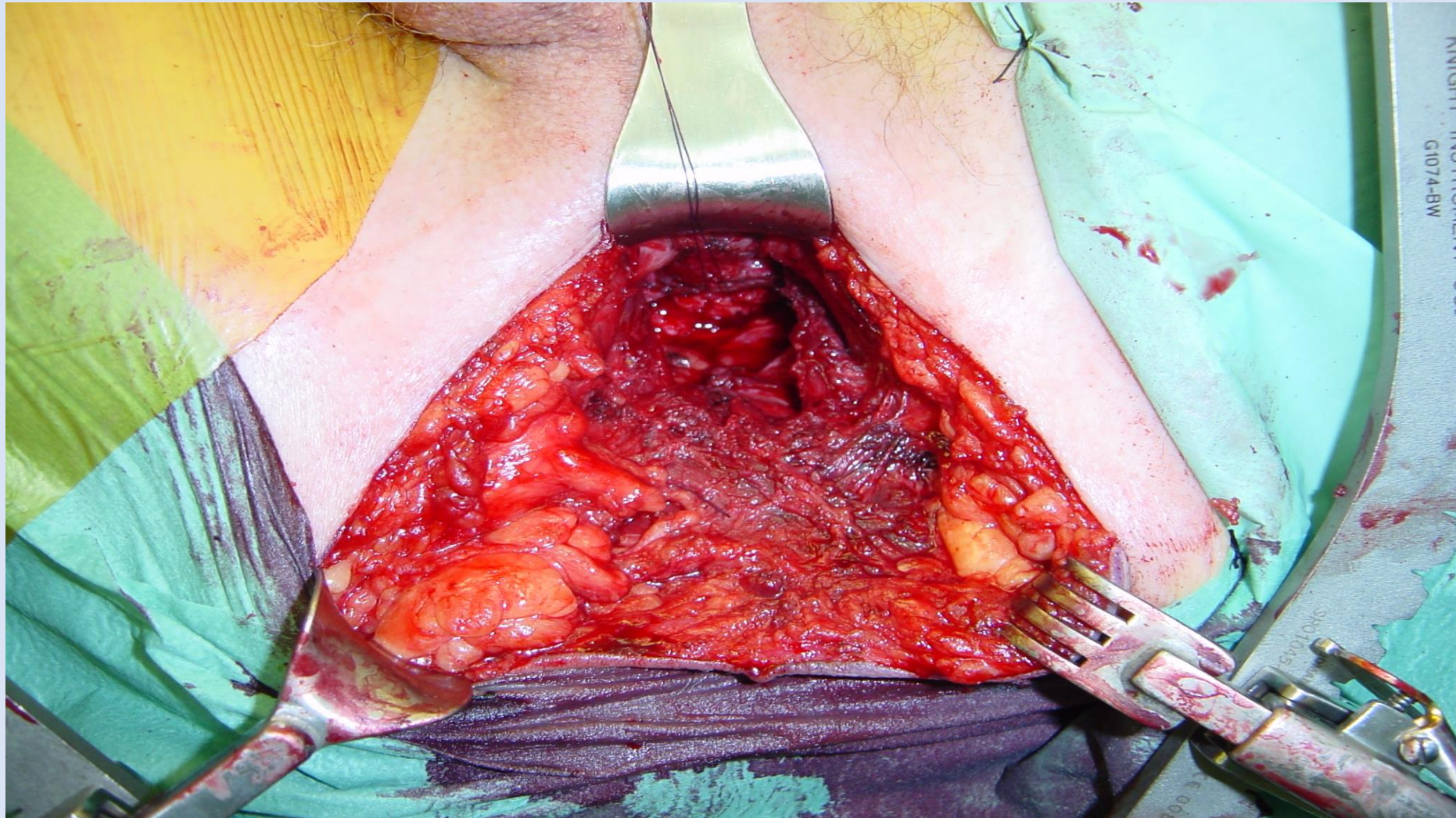
# Technique 6



# Technique 7

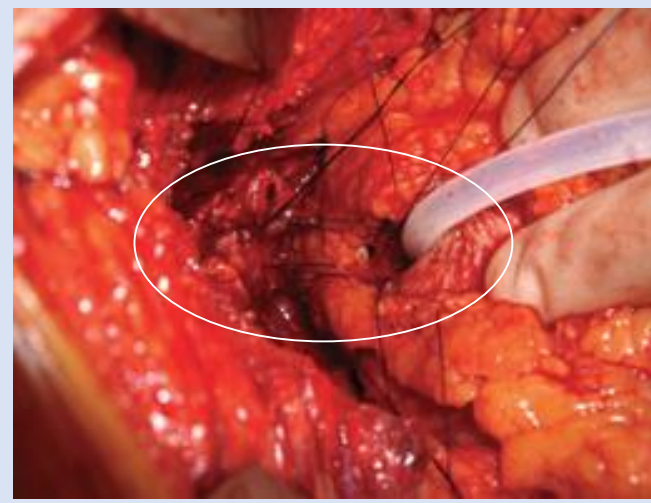
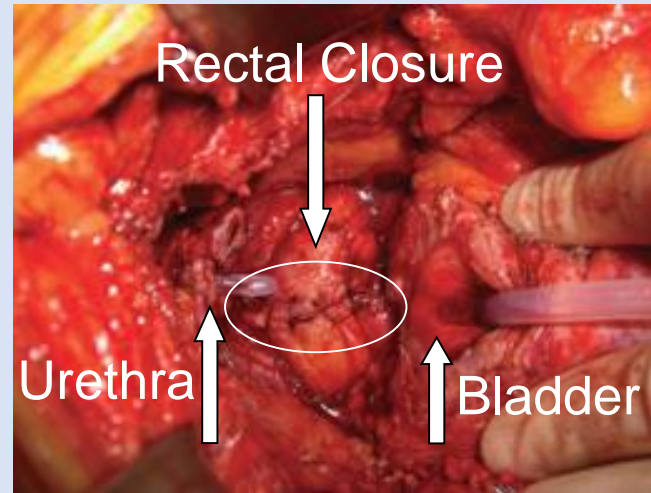
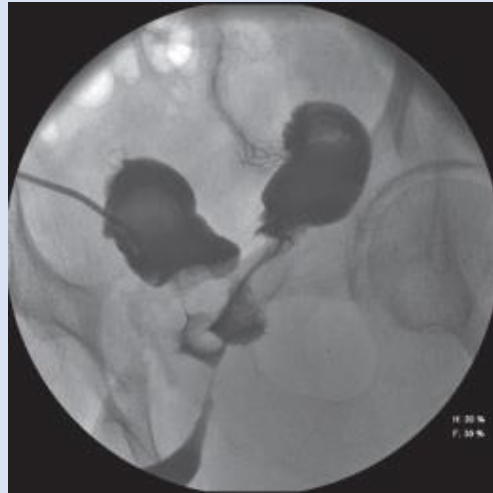


# Technique 8



# Abdomino-Perineal Repair of Direct Fistula

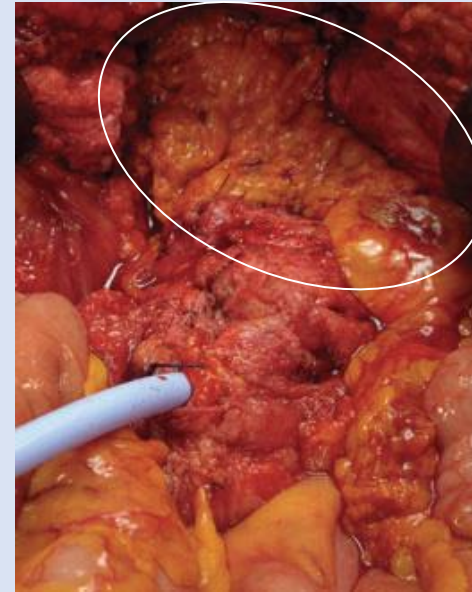
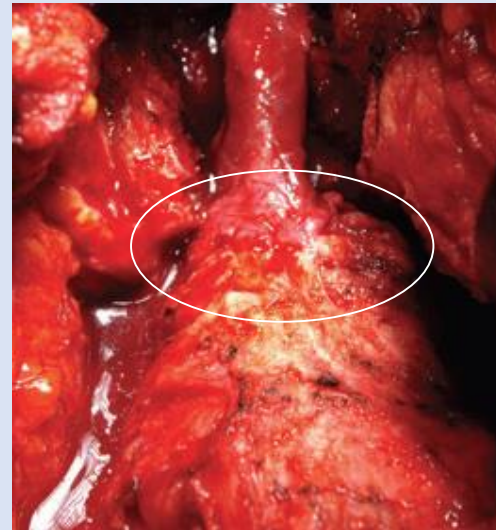
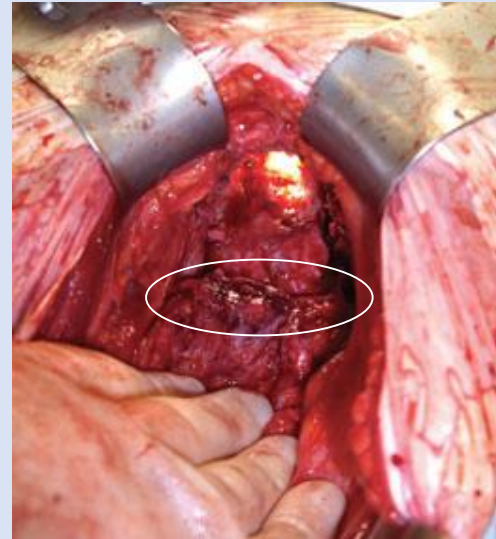
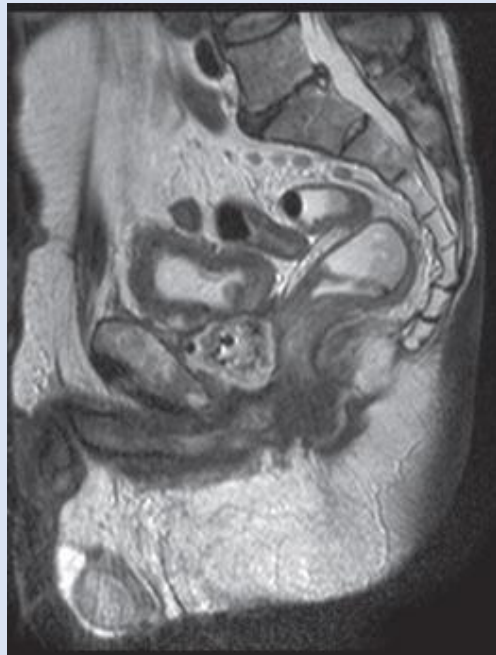
with salvage prostatectomy for a post-RT fistula and rising PSA



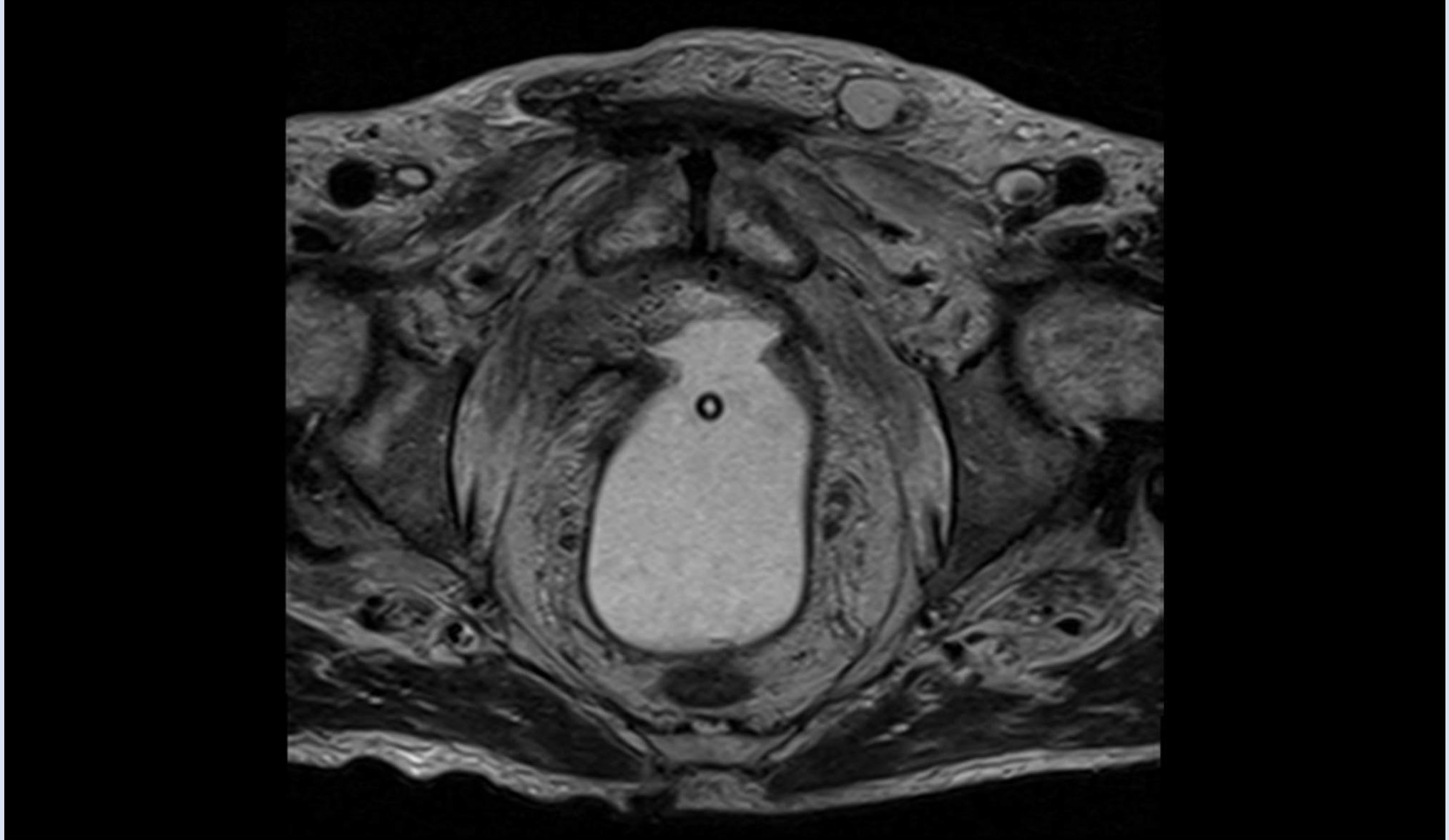
Fistula of intermediate complexity – Usually but not always an A-P repair

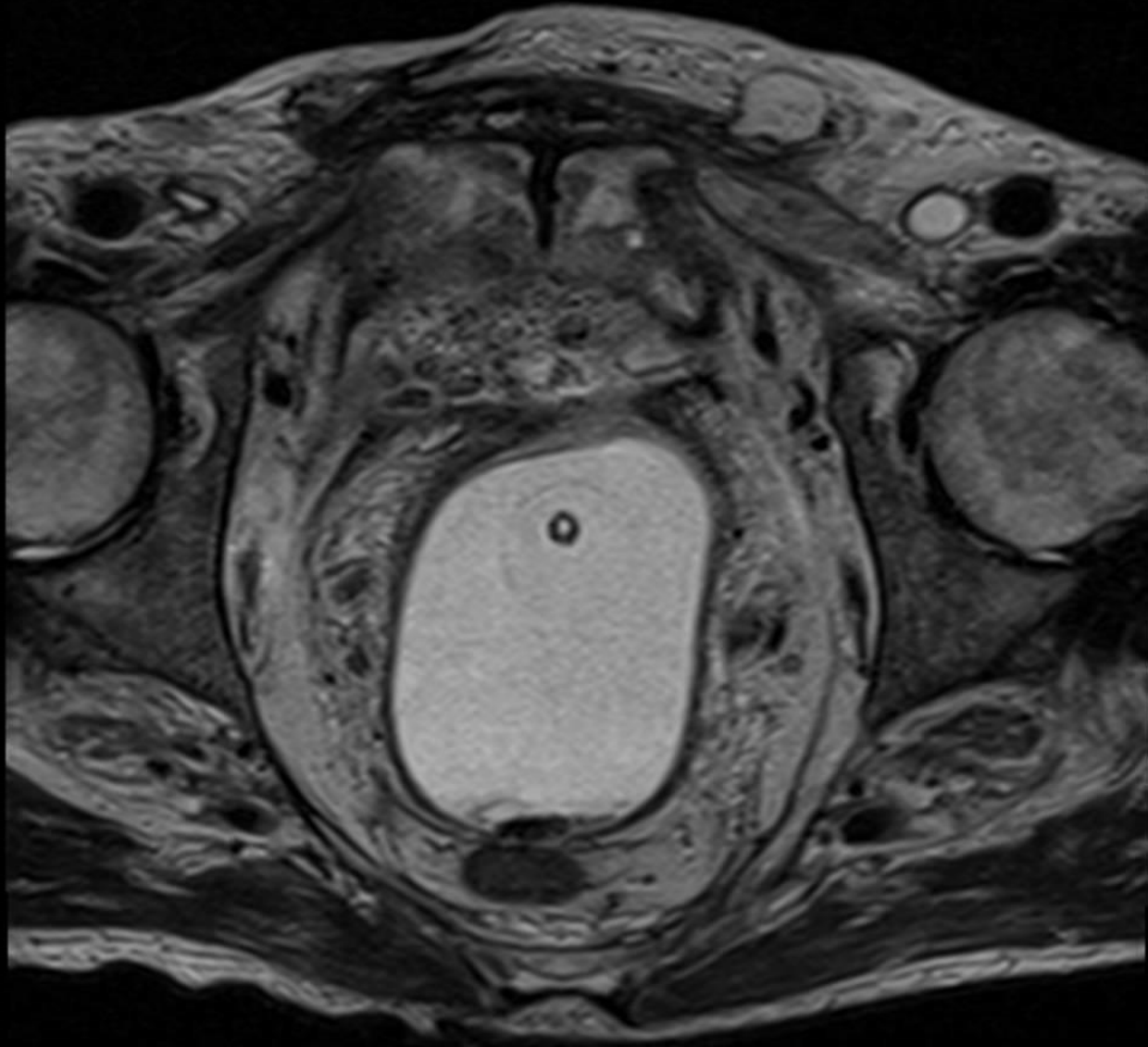
# Abdomino-Perineal Repair of a Cavitating URF

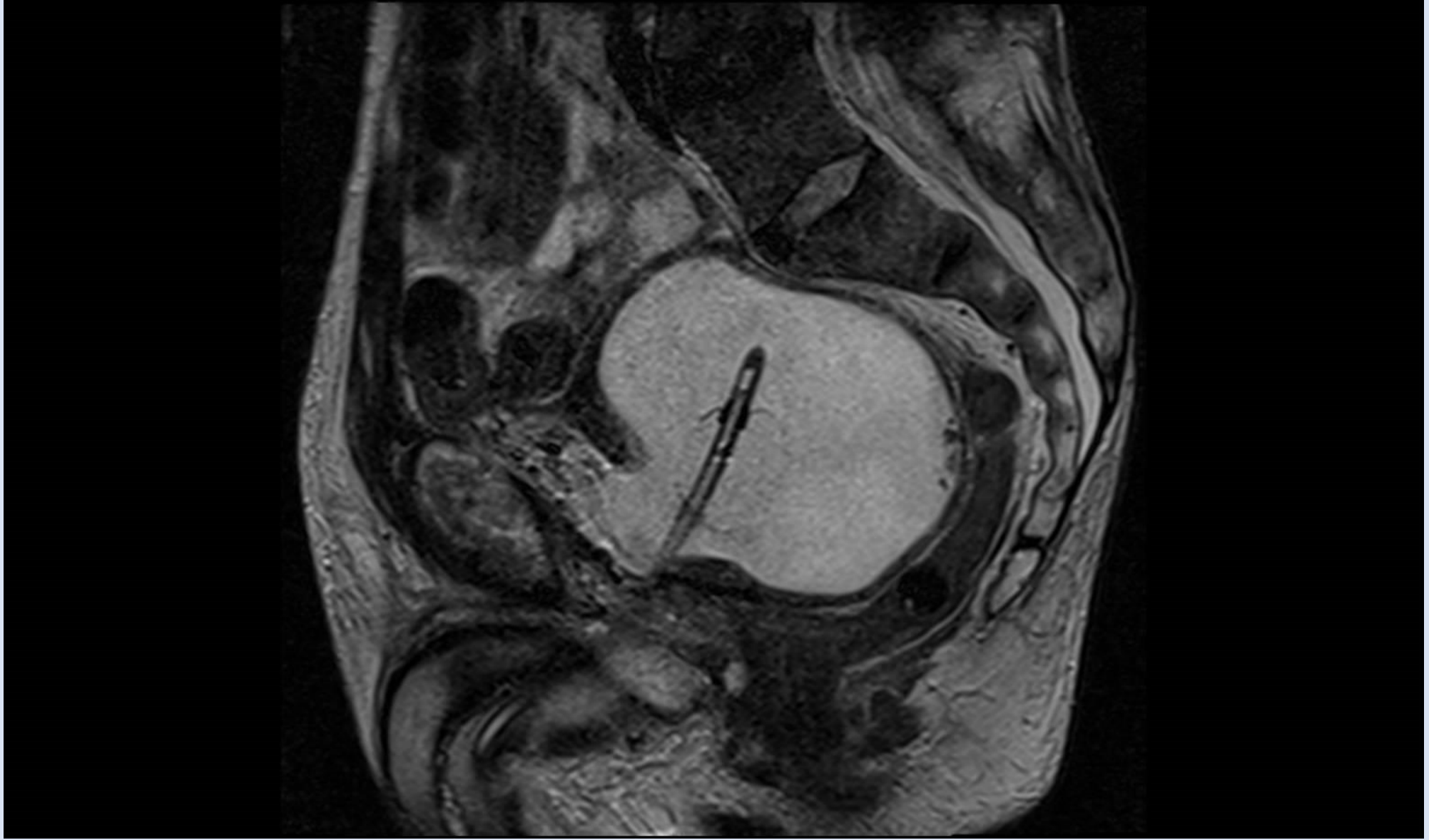
Complex Fistula – usually but not always post-irradiation



# What's New?





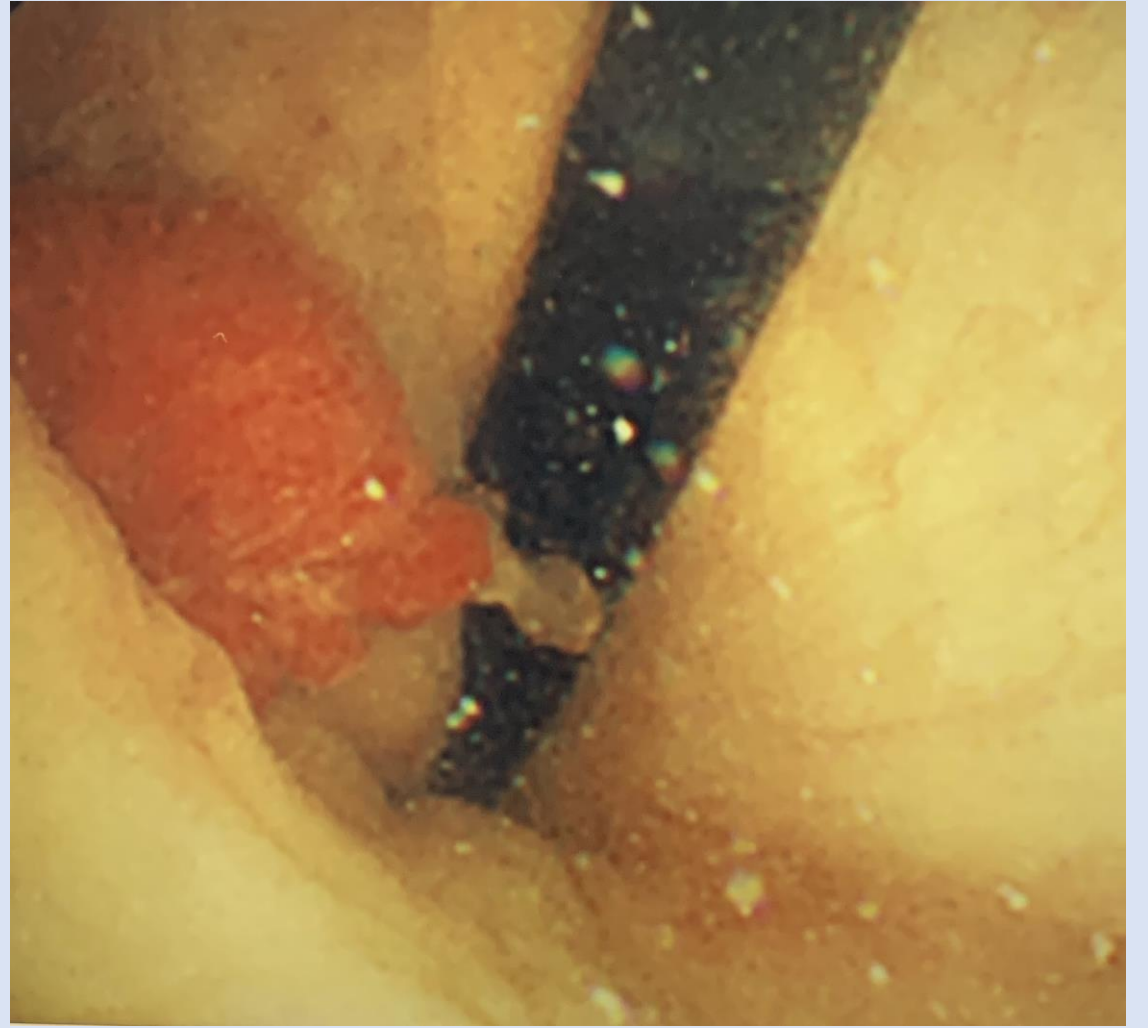
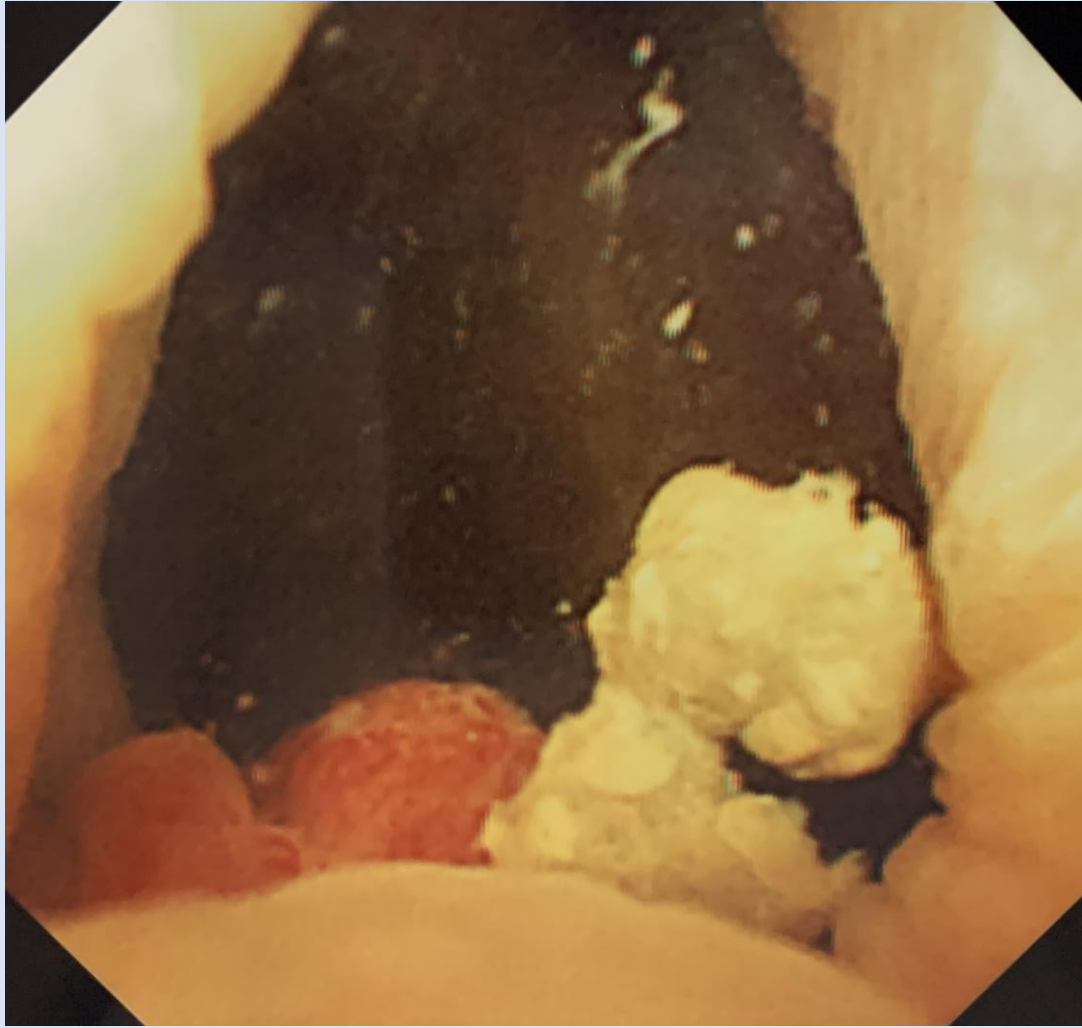




# A New Pet Hate

Mesh from a Previous or Subsequent Hernia Repair





# Other Approaches

- Conservative – if no pain and minimal symptoms
  - Parks - 67% but minimally invasive
- York-Mason – the most popular alternative but:
  - No access to the urinary defect
  - No possibility for an interposition flap except as a separate procedure
    - Risk of ano-cutaneous fistula
    - Risk of anal sphincter incontinence

# Uro-Rectal Fistula\* - Outcomes

## Surgical

48 patients

- 2-3 weeks
- Size: tiny-small  $\pm 3\text{mm}$
- >2y follow up: 98% success (47/48)<sup>#</sup>
  - No colostomy<sup>†</sup> in 5/48
  - No gracilis flap in 35/48

## Radiotherapy

- 55 patients
- 17-37 months
- Size: small-large  $\pm 2\text{cm}$
- >2 year follow up: 85% success 47/55<sup>#</sup>
  - No colostomy<sup>†</sup> in 18/55
  - Interposition flap in all

\*excluding uro-symphyseal fistulae

# Conclusions

- 92% of patients with post-surgical fistulae can be treated by transperineal surgery with a 98% success rate
- Only 33% of post-irradiation patients can be treated transperineally; the other 67% require an abdomino-perineal approach
- After radiotherapy, either approach is only suitable in carefully selected patients\*, although the outcome is satisfactory in 85% of those cases

## “Carefully Selected Patients”

- Used to mean those with a bladder capacity  $>250\text{ml}$
- Now means those with a ‘more or less normal’ bladder – endoscopically and urodynamically

# Conclusions - 2

- Post-operative morbidity of post-irradiation patients undergoing abdomino-perineal surgery is high (62%), the recovery protracted and the return to functional normality prolonged
- A colostomy may not always be necessary but is always safe
- An interposition flap may not always be necessary but is always safe
- We have usually been able to close at least one 'system' making a double diversion unnecessary

# Rectal Cancer Patients and Procedures

- 32 patients with a URF between 2005-2015
  - Minimum follow up 1 year
  - 2 died or lost to follow-up

-

- 26 presented with cavitation and fistulation
  - 6 presented with a contained cavity

-

20 after A-P resection

12 after anterior resection



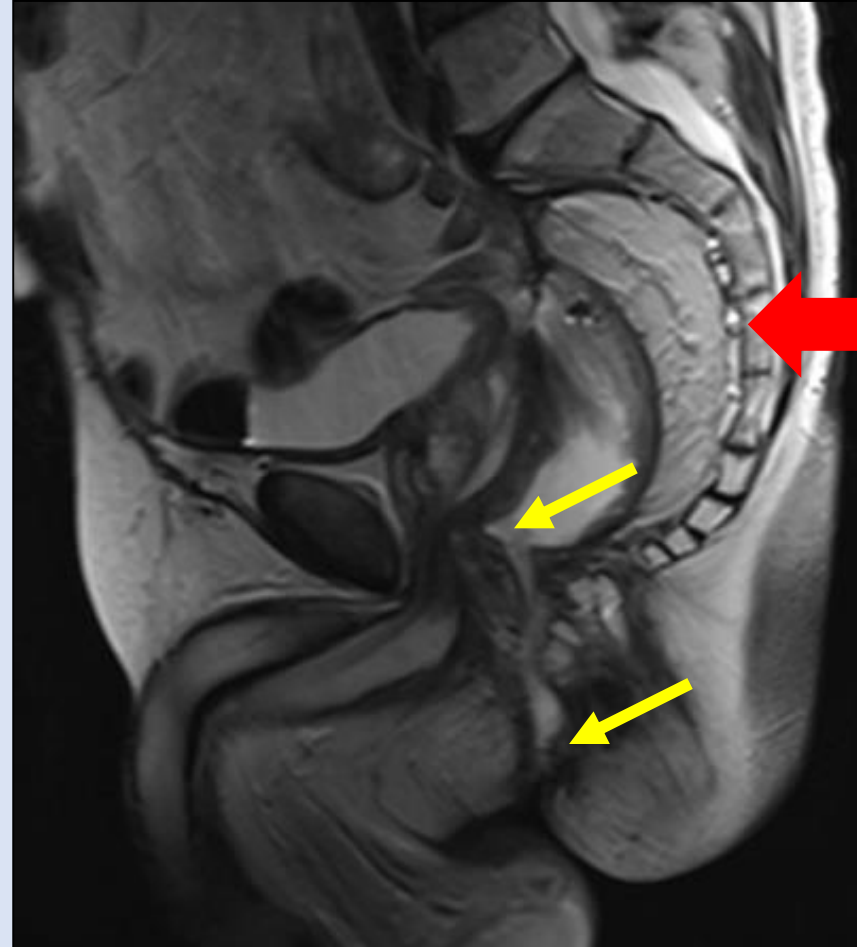
# Uro-Rectal Fistula Following Surgery and Chemo-Radiation for Rectal Cancer

- 56 year old ♂

- Neoadjuvant chemoradiotherapy for rectal cancer
- Laparoscopic anterior resection
  - Complicated by pelvic sepsis
  - Multiple laparotomies – end colostomy and resection of most of remnant rectum
- Chronic pelvic abscess discharging into perineum



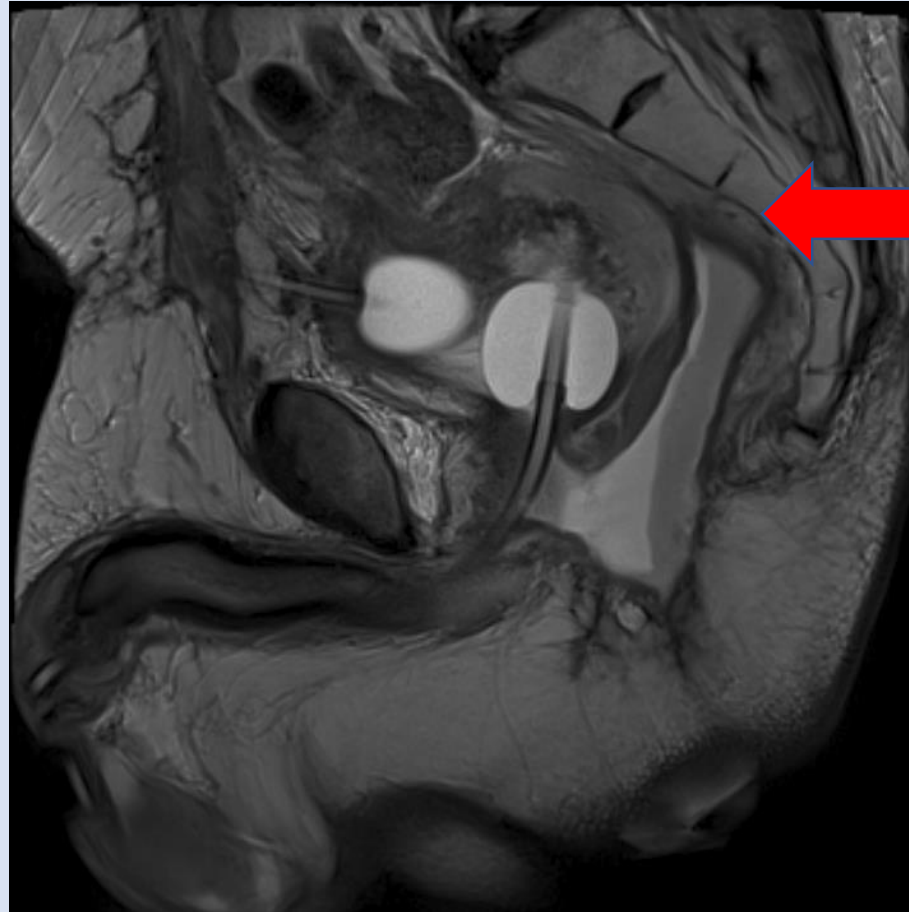
# Cavitation with Fistulation



Sepsis in the  
Pre-Sacral  
Space

# Cavitation But No Fistulation

Anus Sealed Off



Sepsis in the  
Pre-Sacral  
Space

# Management

- 6 with minimal symptoms managed conservatively
  - 1 subsequently required surgery for recurrent sepsis
- 26 → 27 were managed surgically
  - 3 underwent a single diversion with repair of the other system
  - 24 underwent reconstruction

# Palliation with a Catheter in the Pre-Sacral Space



# Surgical Approach to Reconstruction

- Transperineal approach with gracilis flap 12 (50%)
- Abdominal or abdomino-perineal approach with omental wrap 12 (50%)
  - High fistula
  - Unusually large fistula
    - Cavitation
    - Pre-sacral sepsis
  - Other radiotherapy-related complications
    - Omental wrapping

# Results

- Transperineal approach with gracilis flap 12
  - 8 successes
  - 4 failures salvaged by abdomino-perineal approach
- Abdominal or abdomino-perineal approach with omental wrap 12
  - 11 successes
  - (10 required augmentation or substitution cystoplasty +/- ureteric reimplantation and 4 required an artificial sphincter implant subsequently)
  - 1 failure left with a double diversion

# Conclusions

- Another level of complexity
  - Mainly due to cavitation and sepsis in the pre-sacral space
    - Surgery is a major undertaking with a protracted recovery
- Best done abdomino-perineally to deal with the pre-sacral space
  - Most are salvageable and do not need a double diversion
  - Additional badder and ureteric surgery is usually necessary