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-Symphysyal 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 obliterator
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
<table>
<thead>
<tr>
<th></th>
<th>RRP</th>
<th>RRP+EBRT</th>
<th>RT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>52</td>
<td>18</td>
<td>15</td>
</tr>
<tr>
<td>Repaired</td>
<td>52</td>
<td>18</td>
<td>15 salvage RRP</td>
</tr>
<tr>
<td>1° success</td>
<td>49</td>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td>2° success</td>
<td>3</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Success</td>
<td>52/52 100%</td>
<td>13/18 72%V*</td>
<td>10/15 67%</td>
</tr>
<tr>
<td>Dry &amp; voiding</td>
<td>All AUS</td>
<td>All dry &amp; voiding*</td>
<td>Dry and voiding*</td>
</tr>
<tr>
<td></td>
<td>88 100%</td>
<td>67% D&amp;V; 72%V*</td>
<td>67%</td>
</tr>
</tbody>
</table>
## Bladder Neck/Prostatic Urethral Contracture

### Outcomes

<table>
<thead>
<tr>
<th></th>
<th>Surgery</th>
<th>RT</th>
</tr>
</thead>
<tbody>
<tr>
<td>In Patient Stay</td>
<td>4.5d</td>
<td>9.5d</td>
</tr>
<tr>
<td>Out Patient Recovery</td>
<td>3w</td>
<td>9w</td>
</tr>
<tr>
<td>Degree of Functional Recovery</td>
<td>90%*</td>
<td>65%</td>
</tr>
</tbody>
</table>
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

- Ca Prostate
- Ca Rectum
- Pelvic#
- Other
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-Symphysseal Fistula

Cavitating into the pelvis and beyond
## Classification Of Urinary Fistulae Following the Treatment of Prostate Cancer (147 Patients)

<table>
<thead>
<tr>
<th>Type</th>
<th>Incidence</th>
<th>Reconstructability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1a Direct Post-Surgical</td>
<td>52 (35%)</td>
<td>100%</td>
</tr>
<tr>
<td>Type 1b Direct Post-Irradiation</td>
<td>46 (31%)</td>
<td>88%</td>
</tr>
<tr>
<td>Type 2a Cavitating Post-Surgical</td>
<td>4 (3%)</td>
<td>100%</td>
</tr>
<tr>
<td>Type 2b Cavitating into the rectum Post-Irradiation</td>
<td>8 (6%)</td>
<td>63%</td>
</tr>
<tr>
<td>Type 2c Cavitating into the pelvis Post-Irradiation</td>
<td>37 (25%)</td>
<td>24%</td>
</tr>
</tbody>
</table>
Technique 1
Technique 3
Technique 4
Technique 5
Technique 6
Abdomino-Perineal Repair of Direct Fistula with salvage prostatectomy for a post-RT fistula and rising PSA

Rectal Closure

Urethra

Bladder

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
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

<table>
<thead>
<tr>
<th>Surgical</th>
<th>Radiotherapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>48 patients</td>
<td>55 patients</td>
</tr>
<tr>
<td>• 2-3 weeks</td>
<td>• 17-37 months</td>
</tr>
<tr>
<td>• Size: tiny-small ±3mm</td>
<td>• Size: small-large ±2cm</td>
</tr>
<tr>
<td>• &gt;2y follow up: 98% success (47/48)#</td>
<td>• &gt;2 year follow up: 85% success 47/55#</td>
</tr>
<tr>
<td>• No colostomy† in 5/48</td>
<td>• No colostomy† in 18/55</td>
</tr>
<tr>
<td>• No gracilis flap in 35/48</td>
<td>• Interposition flap in all</td>
</tr>
</tbody>
</table>

*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 >250ml
• 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 bladder and ureteric surgery is usually necessary