Rising PSA Post LDR Brachytherapy – Recurrence or Bounce

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A PSA bounce is defined as a rise of \( \geq 0.2 \text{ng/ml} \) above an initial nadir with subsequent decline to or below that initial nadir without treatment.
Different levels have been used
  – 0.1ng/ml
  – 0.2ng/ml
  – 0.4ng/ml
  – >35% above the preceding nadir
Aetiology?

- Bacterial or radiation prostatitis
- Late radiation effect
- Persisting radiation proctitis
- Recent ejaculation
- Recent instrumentation
- Micro-vascular fibrosis/infarction
Implant

PSA

ASTRO – 3 consecutive rise after the nadir with PSA levels at least 3 months apart and date of failure (↓) back dated to halfway between nadir and first rise.

Recurrence

1

2

3

Intervention

Time

Belfast Health and Social Care Trust
Implant

Phoenix/Houston – PSA ≥ 2ng/ml above nadir

Recurrence

PSA

≥ 2ng/ml

Implant

Intervention

Time

Belfast Health and Social Care Trust
Christie experience

- 205 men
- Median FU 45 months (24-85)
- 79 (37%) Bounce
- Median time to bounce 14.8 months (1.7-40.6)
- Median Peak PSA 1.8 ng/ml (0.4-7.4)
- Median Magnitude 0.91 ng/ml (0.2-5.8)
- Median Duration 11.3 months (2.3-32.5)
Christie experience

- Younger Men (mean 60yrs vs 64yrs)

- ASTRO failure 5% vs 15% ($p=0.02$) Mean 20.8 months

- Phoenix failure 7.5% vs 15% ($p=0.004$) Mean 28 months

- False calls with both definition
  - 7 ASTRO
  - 8 Phoenix
- Velocity
  - >1 ng/ml
  - Considerable overlap
● Velocity

● No significant difference in PSAdt during bounce compared to ASTRO or Phoenix failures
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<tbody>
<tr>
<td>% Bounce</td>
<td>37</td>
<td>40</td>
<td>17-31</td>
<td>46.3</td>
<td>71.4*</td>
<td>28</td>
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<tr>
<td>Median time to bounce (mo)</td>
<td>14.8</td>
<td>15.2</td>
<td>19.5-20.5</td>
<td>15.1</td>
<td>13</td>
<td>19.4 (no ADT)</td>
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<tr>
<td>Median Peak PSA (ng/ml)</td>
<td>1.8</td>
<td></td>
<td></td>
<td></td>
<td>1.1</td>
<td></td>
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<tr>
<td>Magnitude (ng/ml)</td>
<td>0.91</td>
<td>0.76</td>
<td></td>
<td></td>
<td>0.6 (no ADT)</td>
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<tr>
<td>Duration (mo)</td>
<td>11.3</td>
<td>6.8</td>
<td></td>
<td></td>
<td>6.5</td>
<td></td>
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<tr>
<td>Younger</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>Time to Failure (A/P)</td>
<td>20.8 / 28</td>
<td>30.9</td>
<td></td>
<td>22.3 / 30</td>
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<td>Better Outcome</td>
<td>✔</td>
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What is the best definition of failure following brachytherapy?

- British Columbia Cancer Agency
  - Nadir +2: 2.4% False call
    - Christie: 10%
    - PMH: 15%
    - WBH: 6%
  - Nadir +3: 1.3% False call

IJROBP 2006; 64: 1355-1359
IJROBP 2007; 69: 426-433
RO 2008; 88: 102-107
Proc ASCO GU 2010 Abstract 113
What is the best definition of failure following brachytherapy?

- William Beaumont Hospital
  - Nadir +5 for 2 years
  - Then nadir +2 particularly if <60 yrs old

- WBH 1.2% False call
- PMH 3.5%
- Christie 2.5%
Practical guidance

- PMH
  - Inform and reassure
  - Review pre-treatment and implant characteristics
  - Centralised review 3monthly
  - If PSA has not corrected by 30months then biopsy should be performed.
  - If PSA >10ng/ml then systemic investigations are warranted.

IJROBP 2007; 69: 426-433
Conclusion

- Current definitions of biochemical failure used following LDR prostate brachytherapy are prone to false calls as a consequence of the Benign PSA bounce phenomenon.

- Commit to appropriate PSA surveillance.

- Avoid the premature and inappropriate initiation of salvage therapy.