Prostate Fossa Contouring Guide

Jill Gunther, MD
Modified by the eContour Team
You want to contour: Post-op Prostate

What now?

• Find your references
  – RTOG Prostate Fossa Contouring Atlas
    • [https://www.rtog.org/CoreLab/ContouringAtlases/ProstatePostOp.aspx](https://www.rtog.org/CoreLab/ContouringAtlases/ProstatePostOp.aspx)
  – Consensus guideline publications
    • Michalski, IJROBP 2010
    • Wiltshire, IJROBP 2007
  – RTOG trials with contouring descriptions for IMRT described in the protocol
    • RTOG 0534 (ongoing)
  – eContour.org aims to be your one-stop shop for high yield anatomy and contouring guidelines, including hyperlinks to each of the above!
You want to contour: Post-op Prostate

Check eContour.org for guidance!

1. From HOME PAGE click CASES
2. GU → Prostate → post-prostatectomy (not intact)
3. Review anatomy
4. Draw OARs (rectum and penile bulb)
5. Draw the CTV
6. Add margin/expansion to create final PTV for treatment planning.
Quick review of basic anatomy of prostate/pelvis

- Bladder
- Sacrum
- Seminal vesicles (proximal just means segment close to prostate)
- Rectum
- Prostate
- Pubic symphysis
Sagittal view

Base of prostate

Seminal Vesicles

Apex of prostate
Coronal view

Bladder

Prostate
Axial view

Bladder

Femoral heads

Prostate

Rectum
## Anatomical Borders of Post-Op CTV for Prostate Cancer

<table>
<thead>
<tr>
<th>Below the superior edge of the symphysis pubis</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anterior</td>
<td>Posterior edge of pubic bone</td>
</tr>
<tr>
<td>Posterior</td>
<td>Anterior rectal wall</td>
</tr>
<tr>
<td>Inferior</td>
<td>8-12 mm below VUA</td>
</tr>
<tr>
<td>Lateral</td>
<td>Levator ani muscles, obturator internus</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Above the superior edge of the symphysis pubis</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anterior</td>
<td>Posterior 1-2cm of bladder wall</td>
</tr>
<tr>
<td>Posterior</td>
<td>Mesorectal Fascia</td>
</tr>
<tr>
<td>Superior</td>
<td>Level of cut end of vas deferens or 3-4cm above top of symphysis</td>
</tr>
<tr>
<td>Lateral</td>
<td>Sacrorectogenitopubic fascia</td>
</tr>
</tbody>
</table>

Michalski, IJROBP, 2010
Starting Inferiorly

- Find the lowest slice according to your guidelines

| Inferior | 8-12 mm below VUA | May include more if concern for apical margin. Can extend to slice above penile bulb if VUA not well visualized |

- Locate the **vesicourethral anastomosis** (VUA) which is where the bladder was reattached to the urethra after removal of the prostate
- If difficult to locate VUA, use slice above penile bulb
Start CTV: 4 slices below VUA

Each slice = 2.5mm, so 4 slices puts us 10mm below VUA
Scrolling through CT images, moving superiorly
Boundaries
(inferior to pubic symphysis)

Posterior edge of pubic bone

Anterior rectal wall

Obturator internus muscle

Levator ani

Anterior rectal wall

<table>
<thead>
<tr>
<th>Below the superior edge of the symphysis pubis</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anterior</td>
<td>Posterior edge of pubic bone</td>
</tr>
<tr>
<td>Posterior</td>
<td>Anterior rectal wall</td>
</tr>
<tr>
<td></td>
<td>May need to be concave around lateral aspects</td>
</tr>
<tr>
<td>Lateral</td>
<td>Levator ani muscles, obturator internus</td>
</tr>
</tbody>
</table>
Boundaries
(inferior to pubic symphysis)

- Posterior edge of pubic bone
- Obturator internus
- Anterior rectal wall
What about the bladder?

*Include it!* This is the previous location of the prostate
May need to be concave around lateral aspects
When do I stop?

These boundaries apply only to below (inferior) the superior edge of pubic symphysis.

<table>
<thead>
<tr>
<th>Below the superior edge of the symphysis pubis</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anterior</td>
<td>Posterior edge of pubic bone</td>
</tr>
<tr>
<td>Posterior</td>
<td>Anterior rectal wall</td>
</tr>
<tr>
<td>Lateral</td>
<td>Levator ani muscles, obturator internus</td>
</tr>
<tr>
<td></td>
<td>May need to be concave around lateral aspects</td>
</tr>
</tbody>
</table>

Image: 119/193
So *above* symphysis we need new boundaries

Need to transition down to including only 1-2cm posterior bladder wall
Start pulling back posteriorly
Continue pulling back posteriorly over a few slices until...

Continue this stepwise reduction in volume over several CT slices
Include 1-2cm posterior bladder wall

Obturator internus*

Posterior 1-2cm bladder wall

Mesorectal fascia/rectal wall

Above the superior edge of the symphysis pubis

<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anterior</td>
<td>Posterior 1-2cm of bladder wall</td>
</tr>
<tr>
<td>Posterior</td>
<td>Mesorectal Fascia</td>
</tr>
<tr>
<td>Lateral</td>
<td>Sacrorectogenitopubic fascia</td>
</tr>
</tbody>
</table>

If concern about extraprostatic disease at base may extend to obturator internus
Vas deferens may retract post-op; include SV remnants if pathologically involved
Include all surgical clips that are felt to be in the prostate bed

(can have clips from nodal dissection)
When do I stop?

| Superior | Level of cut end of vas deferens or 3-4 cm above top of symphysis | Vas may retract postoperatively, Include seminal vesicle remnants if pathologically involved |
When do I stop?

| Superior | Level of cut end of vas deferens or 3-4cm above top of symphysis | Vas may retract postoperatively, Include seminal vesicle remnants if pathologically involved |
### Sagittal view

- **3-4 cm above pubic symphysis**
- **8-12 mm below vesico-urethral anastomosis (just above penile bulb)**

<table>
<thead>
<tr>
<th>Inferior</th>
<th>8-12 mm below VUA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superior</td>
<td>Level of cut end of vas deferens or 3-4 cm above top of symphysis</td>
</tr>
</tbody>
</table>
Always check coronal and sagittal views to make sure your volume makes sense.
Guidelines are guidelines

• Consider what is correct for each patient
• Where was his initial disease?
• Was there extraprostatic extension?
  – Where?
• Were the seminal vesicles involved?
• Was there a positive margin? If so, where?

• That said, using consensus guidelines or treated per protocol is usually a safe approach!

DISCLAIMER: Each case is unique and requires decision making based on clinical judgment of the treating physician.
Some add more margin to guidelines with consideration of specific patient risk factors.

Extend into pubic symphysis (ex. Patient with anterior lesion with anterior EPE).

SV fossa contoured separately.

Extended into anterior rectal wall (ex. Patient has clips sitting along rectal wall).
References

• RTOG contouring atlas
