Focal Therapy

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Prostate Cancer Spectrum

1: low risk, low volume
2: low risk, high volume
3: int risk, low volume
4: int risk, high volume
5: high risk, low volume
6: high risk, high volume

TREATMENT INTENSITY
Prostate Cancer Spectrum

Age

Comorbidities

Quality of Life

Urodynamics
Why do focal therapy

- Theoretically makes sense
- Especially low volume, low risk disease
- Is it a compromise between active surveillance versus radical therapy?
- Primary goal
  - Equal disease eradication
  - Less morbidity
- Lower cost
- Multiple salvage options (failure)
- Patients ask for it
The guidelines on focal treatment

Not mentioned

In its infancy and cannot be recommended outside trial

Not mentioned

inclusion into focal therapy trials

Not mentioned (2011)
Is There a Precedent?
The Revolution

• Precise location of malignancy within prostate
• Target therapy to that location

Revolution:

“transition from not knowing where the tumor is to knowing where the tumor is”

–Mark Emberton (Jan. 2015, Vail, CO)
Factors that affect patient’s choice of treatment

- Cure rates
- Bladder/bowel toxicity
- Sexual function
- Time off work
- Cost
Methods of Focal Therapy

LAT
Lesion ablation therapy

HAT
Hemiablation therapy

SAT
Subtotal ablation therapy

Unifocal
Unilateral
Unilateral dominant
Bilateral dominant

Likelihood of cure
Number of candidates
Effect on mortality

Focal Therapy in Prostate Cancer, First Edition 2012; Ch. 4 Selection Criteria for Prostate Cancer Focal Therapy; Jain, Ito, Taneja
Modalities

- Cryotherapy
- High Intensity Focused Ultrasound (HIFU)
- Vascular photodynamic therapy (PDT)
- Focal laser ablation (FLA)
- Brachytherapy
  - High Dose Rate
  - Low Dose Rate
Who are candidates for focal therapy?

- Low risk, low volume disease
- Intermediate risk, low volume disease
- High risk, low volume disease
Male Lumpectomy Cryotherapy
Focal Therapy

• 70 patients 5/7/96 – 12/28/05
• Follow-up 8-18 years (mean 10.1 yrs)
• 89% (62/70) BDFS (Phoenix def: nadir+2)
  – Low risk 26/29 (90%)
  – Int risk 28/32 (88%)
  – High risk 8/9 (89%)

Male Lumpectomy Cryotherapy Focal Therapy

Local Recurrence by Biopsy Technique

- TRUS (8/24) 33%
- 3DPMB (2/46) 4%

Toxicity

- Continence 100%
- Potency 94%

Focal Implants at CPCC

• 68 patients 04/09 – 08/15
• Median age 79.5 years
  – First 5 years: 82.5 years
  – Last 5 years: 75.8 years

• 46 TRPB
• 22 STPB
Risk Groups

- Low: 40.3%
- Intermediate: 44.8%
- High: 9.0%
- Salvage: 7.5%
PSA Response

- Highly variable/ based on volume of ablation
- No agreed upon standard (such as nadir + 0.2 ng/ml)
- Nguyen et al: PSA velocity 0.75 ng/ml per year

Nguyen et al. J Urol 2012 Oct
Focal Impact PSA Kinetics?

\[
\text{Treated Volume} \quad \text{PSA} \quad = \quad \text{Post-treatment PSA decline}
\]

\[
\frac{\text{Total Volume}}{\text{Pre-treatment PSA}} \cdot \frac{100}{T_x} \quad \alpha \quad \text{PSA decline}
\]
Key

- Identify what area to treat (DIL)
- Identify areas not to treat
Using Multi-parametric MRI Maps for Identification of Dominant Lesion

( Moradi et al JMRI-2012)
Tumor Localization

- Multiparametric MRI (DIL)
- Comprehensive 3D Mapping Transperineal Biopsy
- Prior to this, we only had radical prostatectomy specimen to accurately identify cancer location
Fig. 1. Example of focal lesion delineation on a (a) T2-weighted and (b) diffusion-weighted MRI apparent diffusion coefficient map of the prostate, patient supine. GTV = gross tumor volume.
3DPMB

- Transperineal template guided biopsy
- 5 mm (x,y axis)
- 95% sensitivity (tumors $\geq 0.5$ cc)
- 3D PMB/whole mount RP specimens (96% confirmation)

Crawford, ED et al. BJU 2005
Crawford, ED et al. Prostate 2013
Fusion Technology (MRI/Ultrasound)
CPCC Focal Therapy Using Cesium\textsuperscript{131}

- Started 4/2015
- Accrued 21/50 patients
- Objectives
  - Evaluate PSA response
  - Determine rate of PSA kinetics
  - Quality of life (EPIC)
  - Evaluate nature of biopsy (STPB vs TRPB)
- Dose to target: 115 Gy
What We Don’t Know

• Optimal outcome assessment after focal therapy

• Follow-up is a problem
  – Regardless of treatment type
  – Leave untreated gland ➡ PSA
  – Not the nadir as much as PSA kinetics (stable)
International Symposium on Focal Therapy and Imaging of Prostate and Kidney Cancer

- 8th Annual, Amsterdam, June 21-23, 2015
- 7th Annual, Los Angeles, August 21-23, 2014
- 6th Annual, Amsterdam, May 29, 2013
- 5th Annual, Duke, June 6, 2012
- 4th Annual, Amsterdam, May 25, 2011
- 3rd Annual, Washington DC, Feb 24, 2010
- 2nd Annual, Amsterdam, June 10, 2009
- 1st Annual, Washington DC, Feb 21, 2008

www.focaltherapy.org
There is emerging evidence that focal therapy will have similar disease control as the whole gland treatments, however, the morbidity may be much less
Conclusions

• Focal therapy has significant promise
• Proper patient selection
• Ideally treated on study
• Optimal modality: yet to be determined
• Salvage treatment should still be possible