

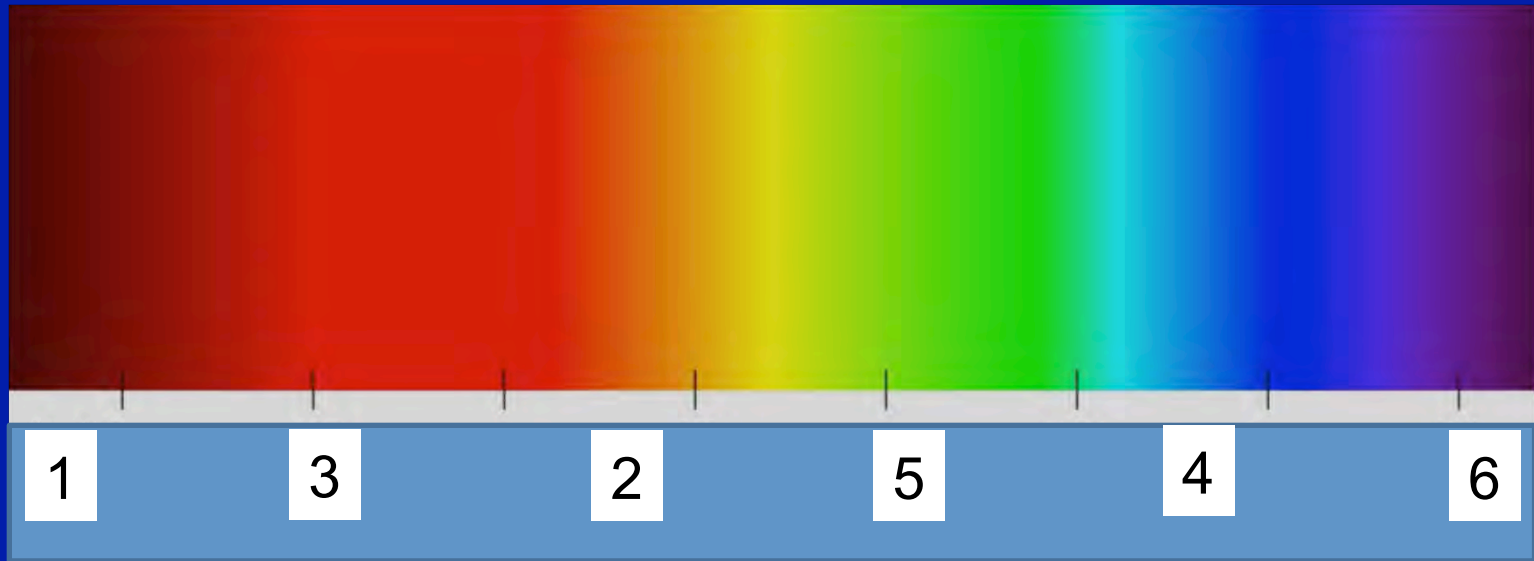
Focal Therapy



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Chicago Prostate Cancer Center

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

Focal therapist

The guidelines on focal treatment

Not mentioned

In its infancy and cannot be recommended outside trial

Not mentioned

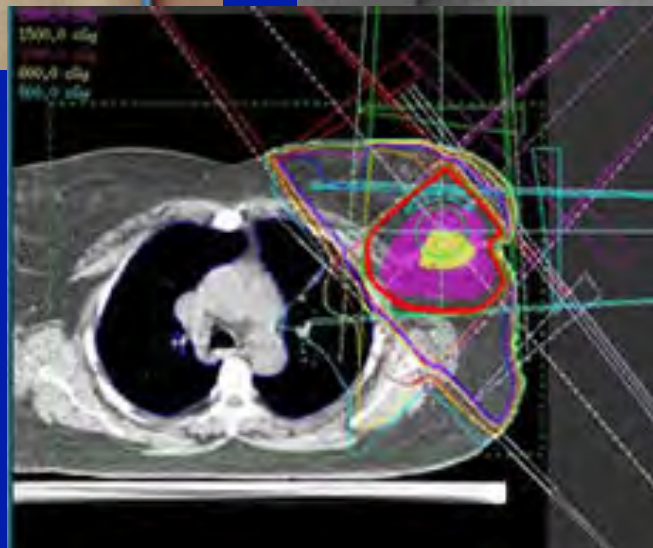
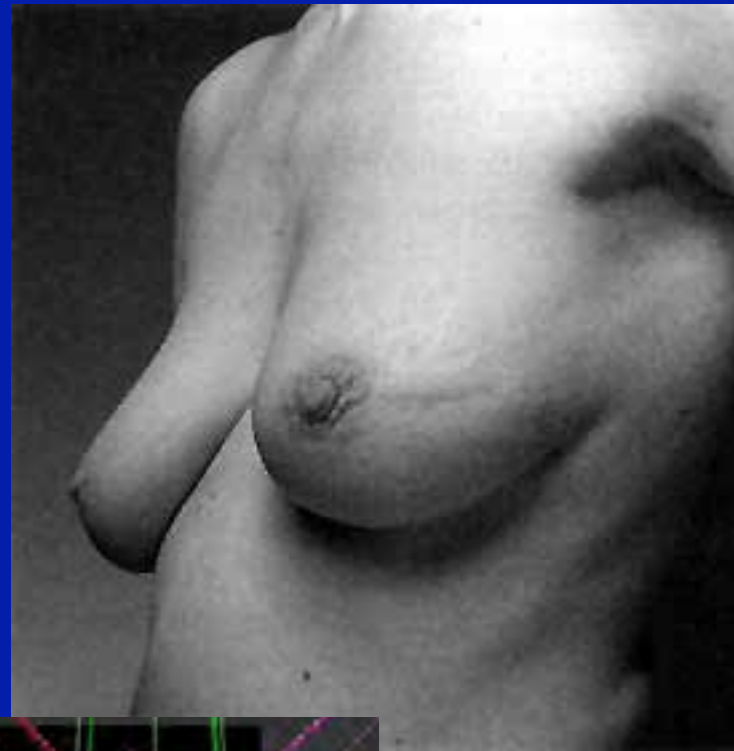
inclusion into focal therapy trials

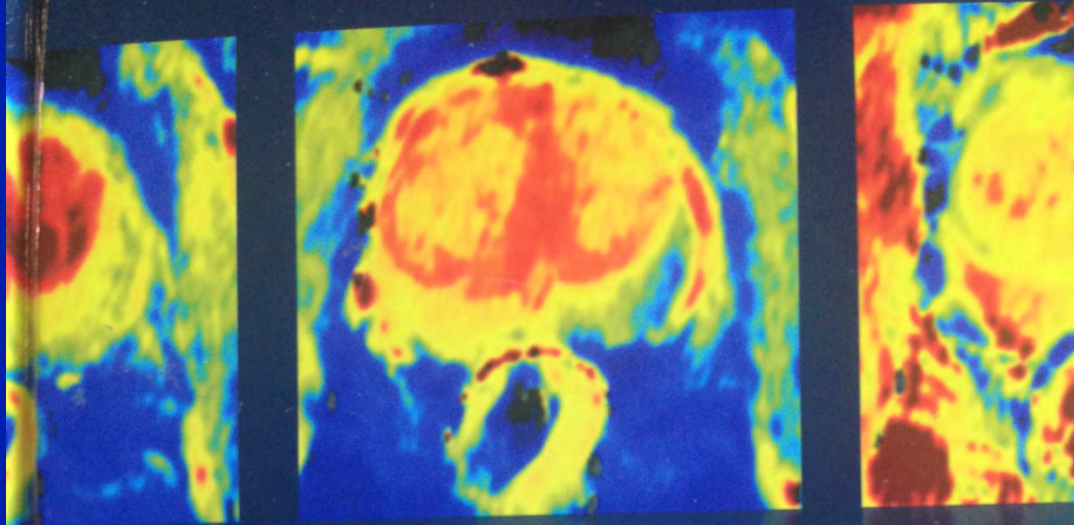
Not mentioned (2011)



Under treatment

Is There a Precedent?





Focal Therapy in Prostate Cancer

Edited by

Hashim U. Ahmed, Manit Arya,
Peter R. Carroll and Mark Emberton

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)

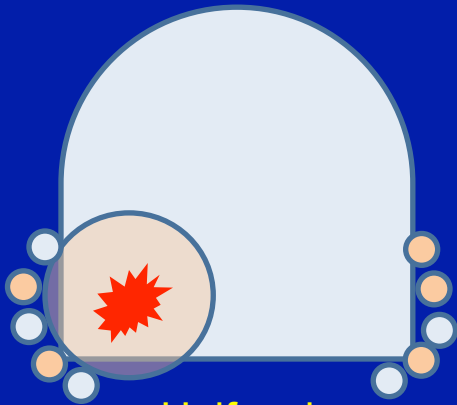
Factors that affect patient's choice of treatment

- Cure rates
- Bladder/bowel toxicity
- Sexual function
- Time off work
- Cost

Methods of Focal Therapy

LAT

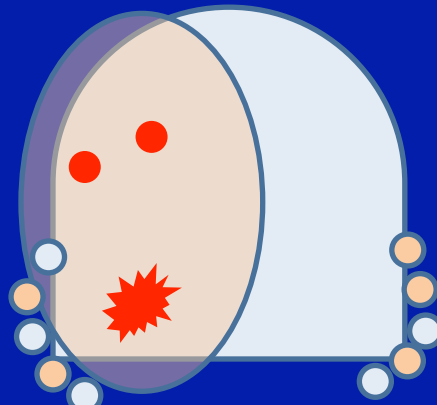
Lesion ablation
therapy



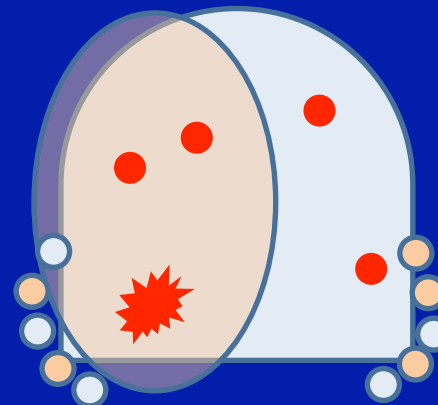
Unifocal

HAT

Hemiablation
therapy



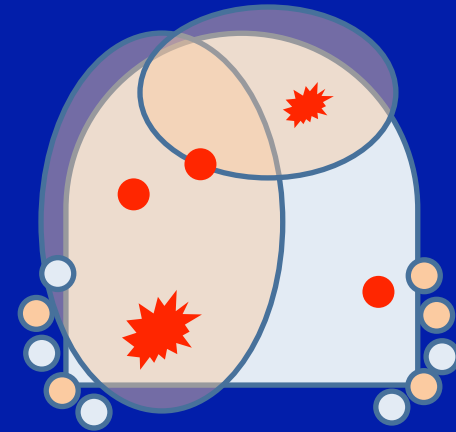
Unilateral



Unilateral
dominant

SAT

Subtotal ablation
therapy



Bilateral dominant

Likelihood of cure



Number of candidates



Effect on mortality



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

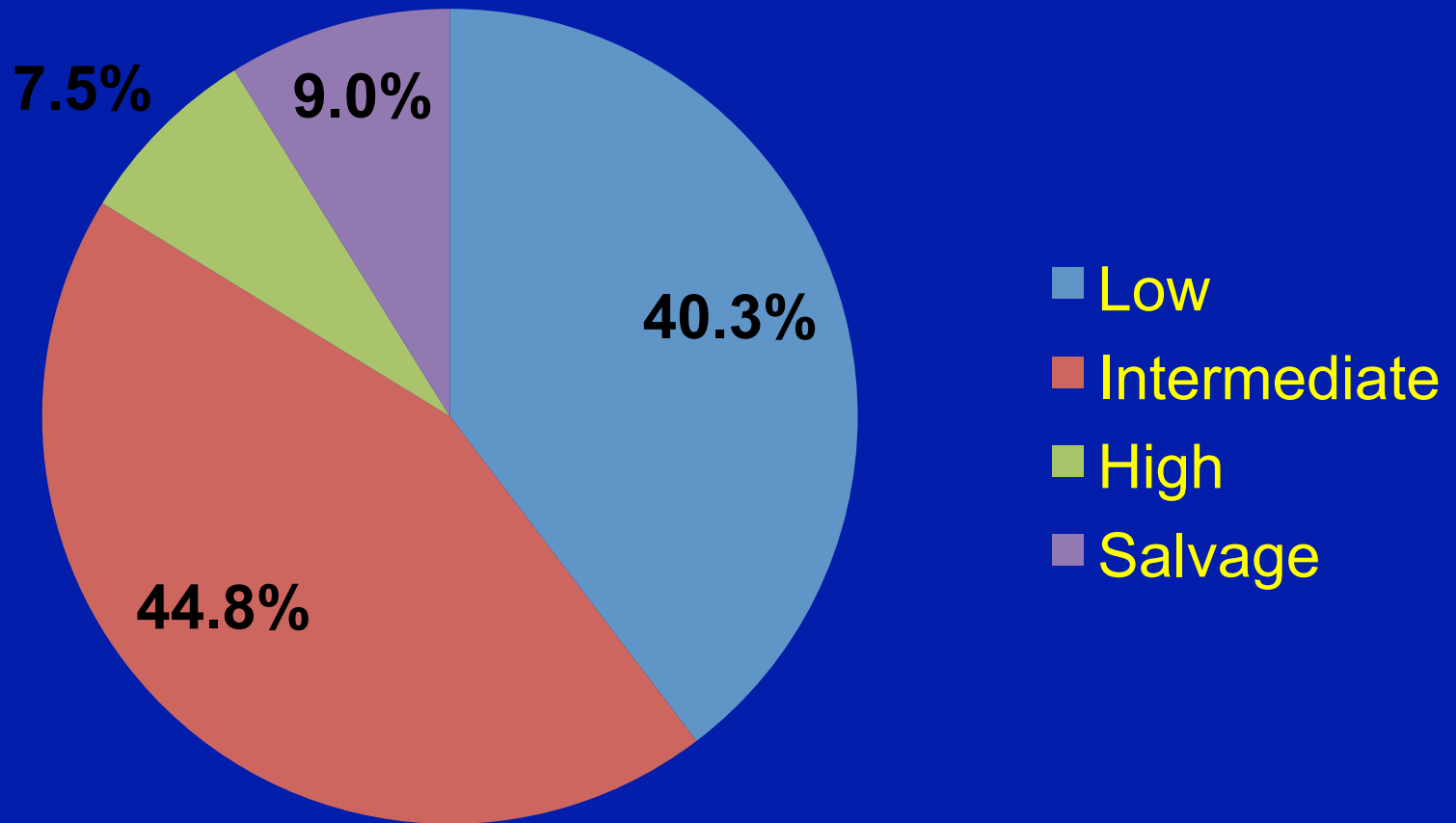
Toxicity

- 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



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?

$$\frac{\text{Treated Volume PSA}}{\text{Total Volume treatment PSA}} = \frac{\text{Post-treatment PSA}}{\text{Pre-treatment PSA}}$$

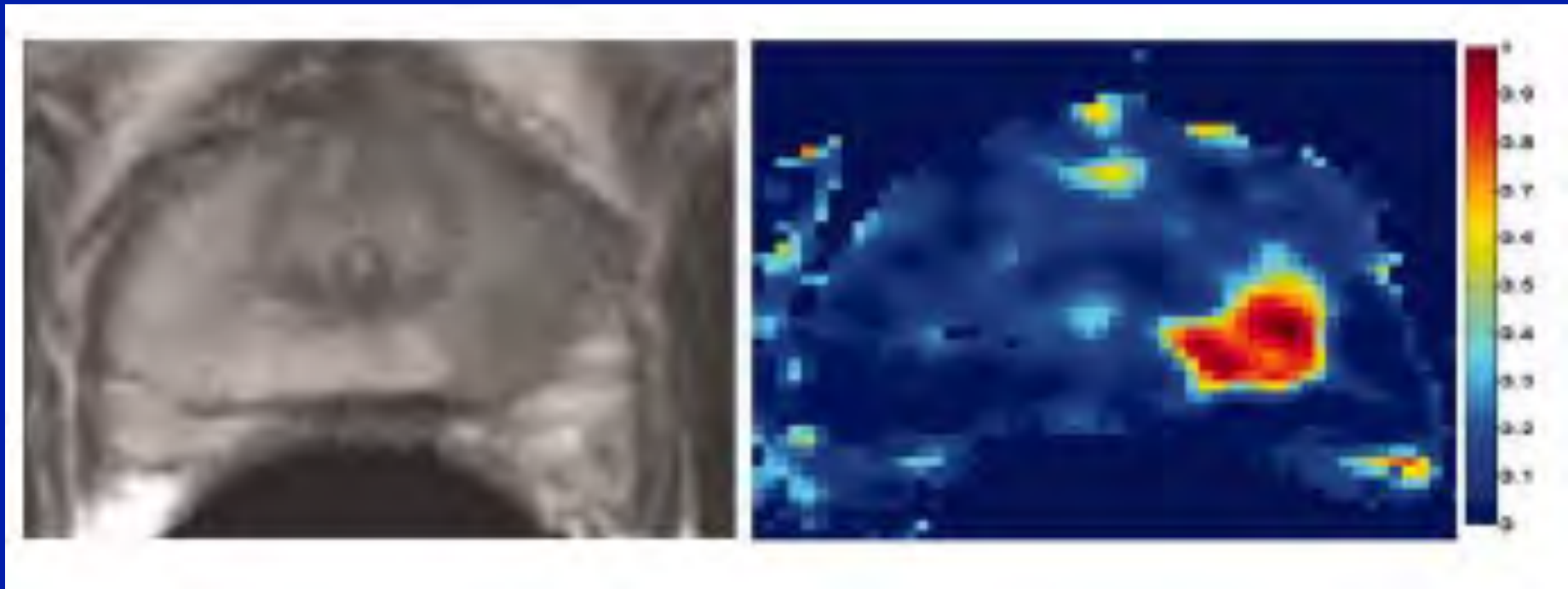
$$\frac{\text{Treated Volume PSA}}{\text{Total Volume treatment PSA}} \propto \frac{\text{Post-treatment PSA}}{\text{Pre-treatment PSA}}$$

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

Focal Lesion Delineation

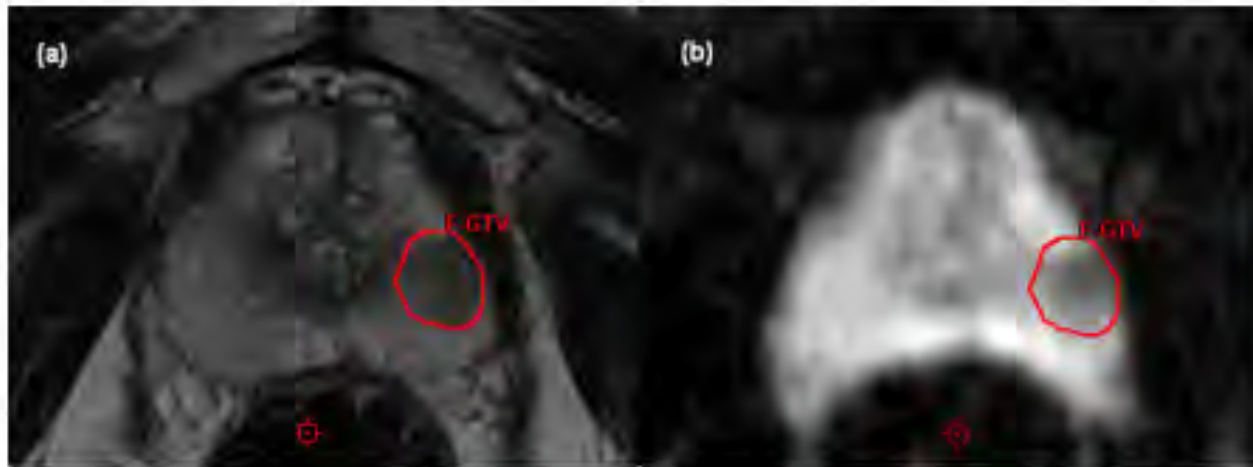
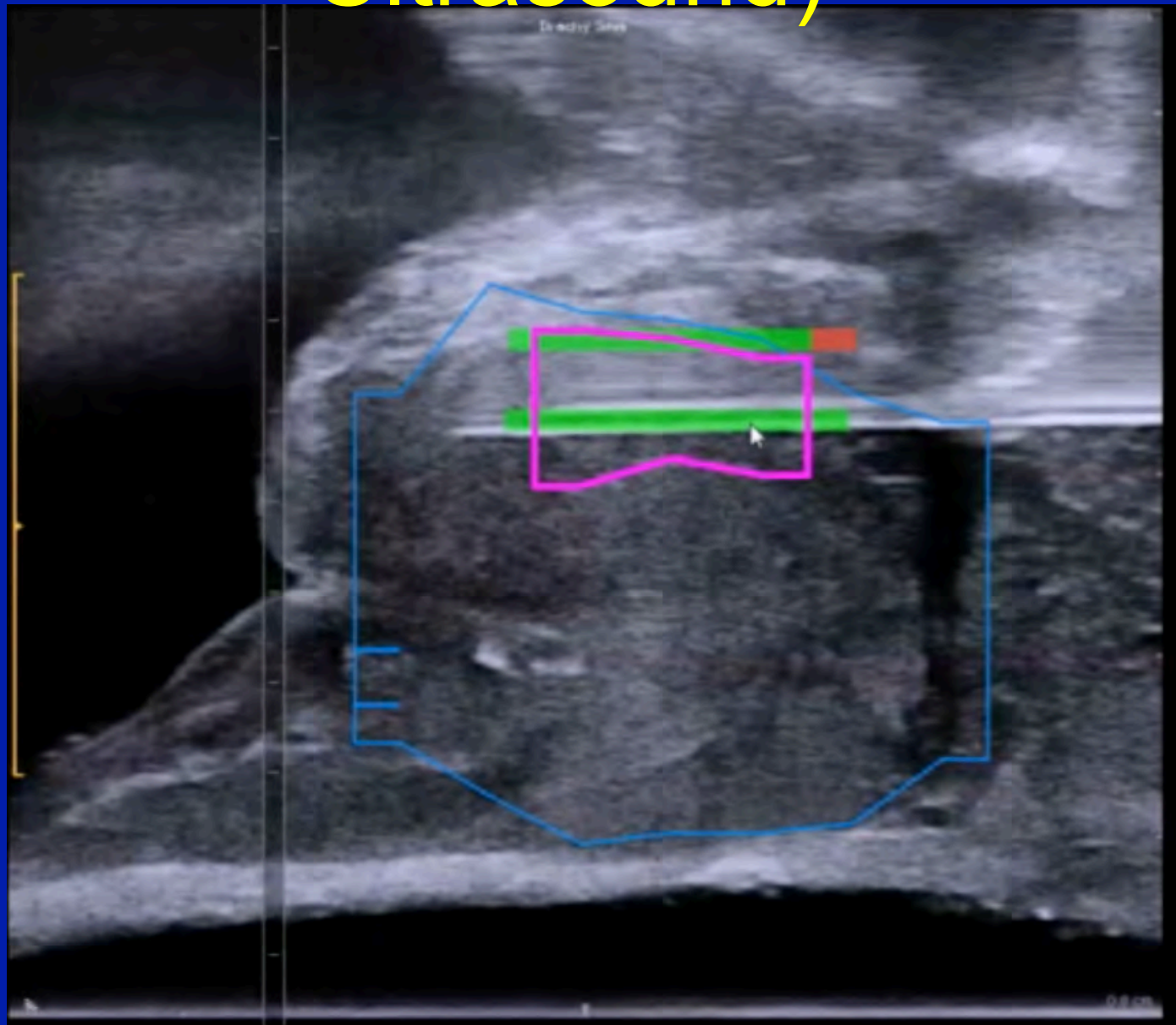


Fig. 1. Example of focal lesion delineation on a (a) T2-weighted and (b) diffusion-weighted MRI apparent diffusion coefficient map of the prostate, patient supine. GTV = gross tumor volume.

3DPMB

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


Fusion Technology (MRI/ Ultrasound)



CPCC Focal Therapy Using Cesium¹³¹

- 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