

Management of Localized Prostate Cancer

Surgery

James A. Eastham, MD
Chief, Urology Service
Memorial Sloan Kettering Cancer Center



Treatment Options

1. Active surveillance/Watchful waiting
2. Focal therapy
3. Radical prostatectomy
4. Brachytherapy
5. HDR monotherapy
6. External beam radiation
7. Brachytherapy plus external beam
8. Cryotherapy
9. Hyperthermia (HIFU)

± ADT



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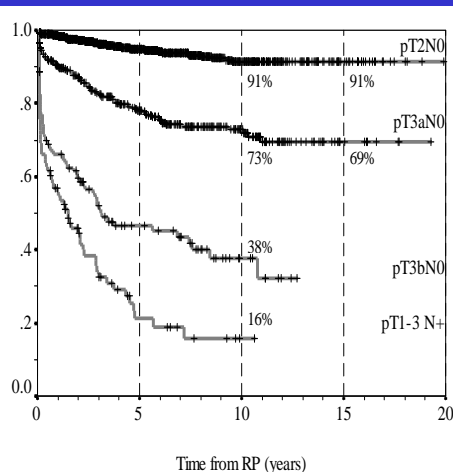
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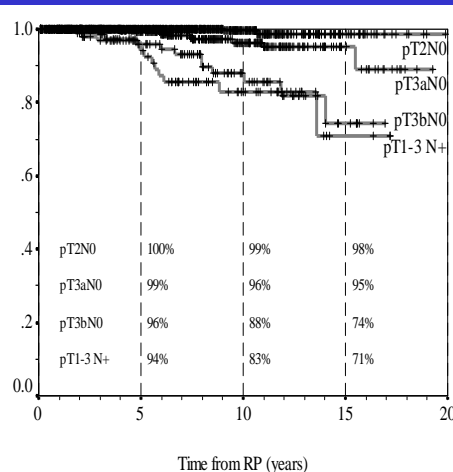
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Long term results of Radical Prostatectomy by pathological stage (MSK series)

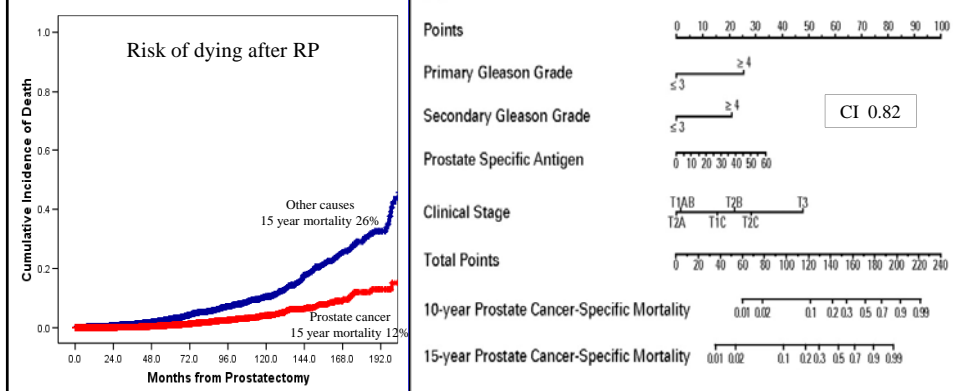
PSA Progression-Free Probability



Cancer Specific Survival



Survival after surgery for prostate cancer



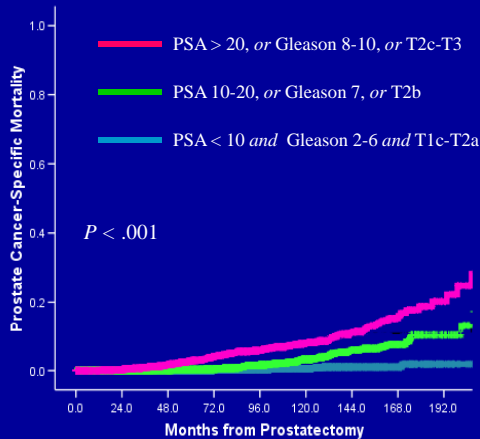
Since 1998, 4% had a probability of PCSM >5% and 0.5% had a predicted risk >30%

Stephenson et al (*J Clin Onc* 2009; 27: 4300)



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Risk of death from prostate cancer by AUA Risk Group*



Risk Group	Pts	PCa Death	15-yr PCSM
High	1816 (19%)	108 (79%)	19%
Intermediate	3327 (35%)	10 (7%)	10%
Low	4338 (46%)	19 (14%)	2%

Majority of deaths were among high risk group, but the risk of death from PCa (19%) was still less than from other causes (31%).

Stephenson A et al. *JCO* 2009; 27:4300.
*AUA Prostate Cancer Guidelines, 2008



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Outcomes After Radical Prostatectomy

- Early post-op complications
- Bladder neck contracture
- Urinary incontinence
- Erectile dysfunction
- Rate of positive surgical margins
- Biochemical recurrence
- **Have all been associated with surgical technique**



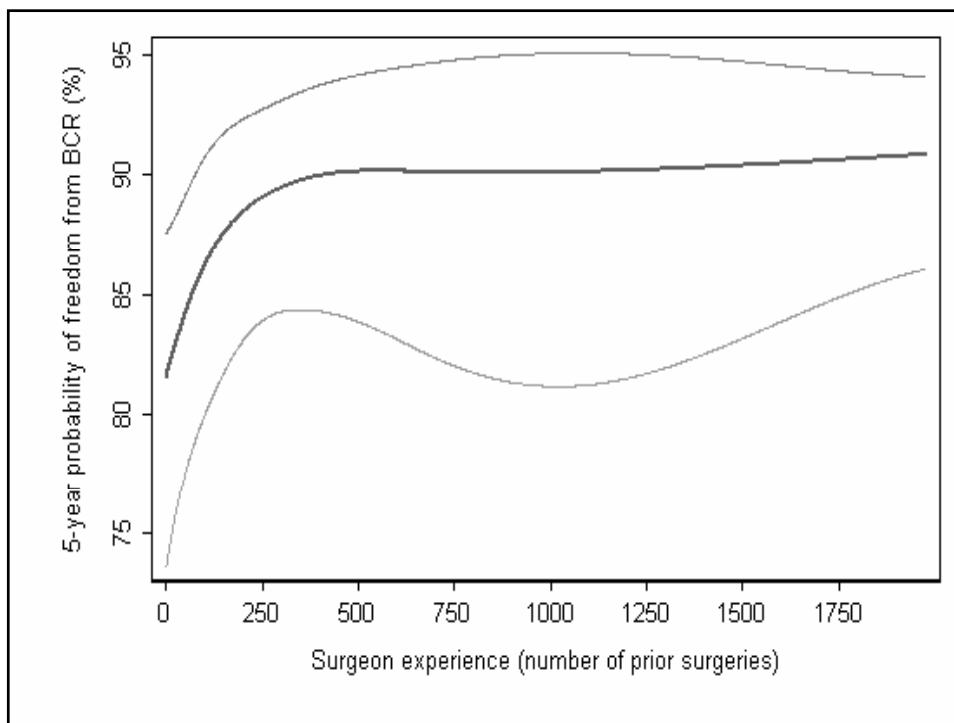
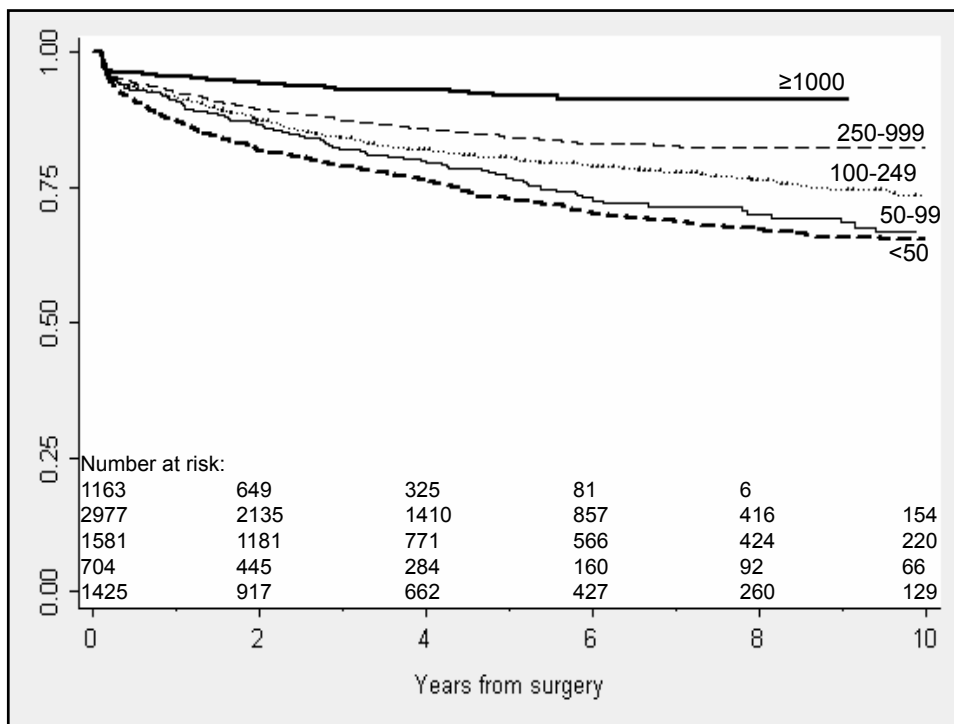
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Does a patient's chance of cure depend on the surgeon?

- MSKCC, Baylor, Cleveland Clinic, Wayne State
- 9376 patients undergoing RP from 1987 - 2003:
 - 210: missing data; 1316: neoadjuvant therapy
 - 7850 patients in sample
- 73 surgeons
 - 38 only conducted RP at a study institution
 - 23 conducted < 20 RP's before treating 1st study patient



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Radical Prostatectomy

- Robotic-assisted laparoscopic RP (RALP)
- Laparoscopic RP
- Open retropubic RP
- Perineal RP



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Open versus Minimally Invasive Radical Prostatectomy

Open

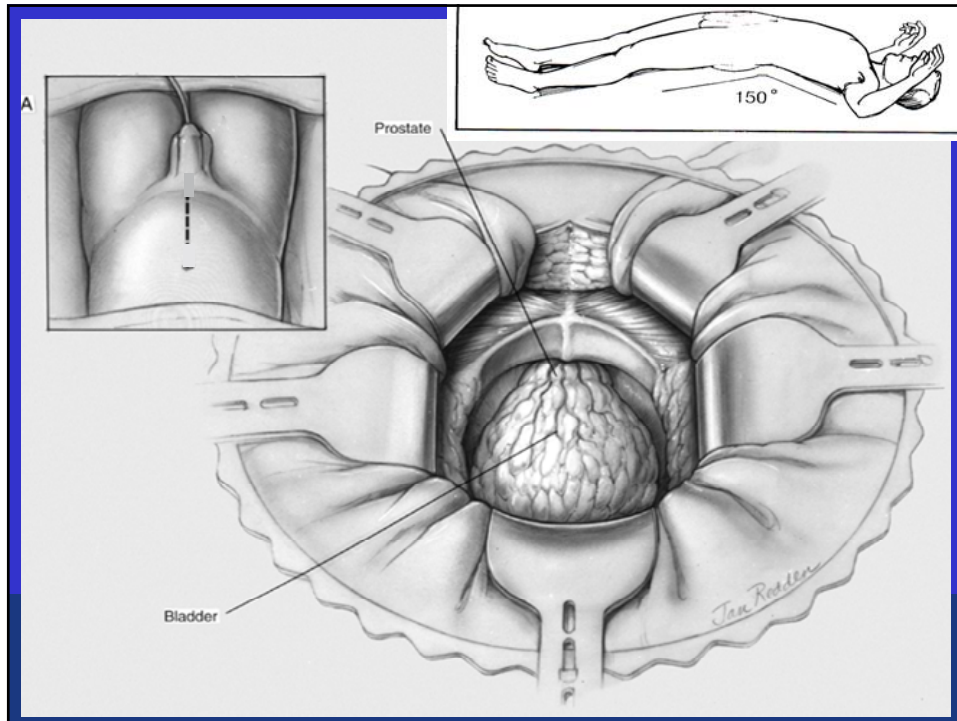
- Advantages
 - Familiarity/Experience
 - Well defined results
 - Excellent cancer control
- Disadvantages
 - Incisional pain
 - Higher blood loss
 - Difficult to visualize nerves without loupes

Minimally Invasive

- Advantages
 - Shorter recovery
 - Rapid return to work
 - Less blood loss
 - Early catheter removal
 - Magnified image
- Disadvantages
 - Technically challenging
 - Loss of sense of touch
 - Immature outcome data
 - ? long-term CA control

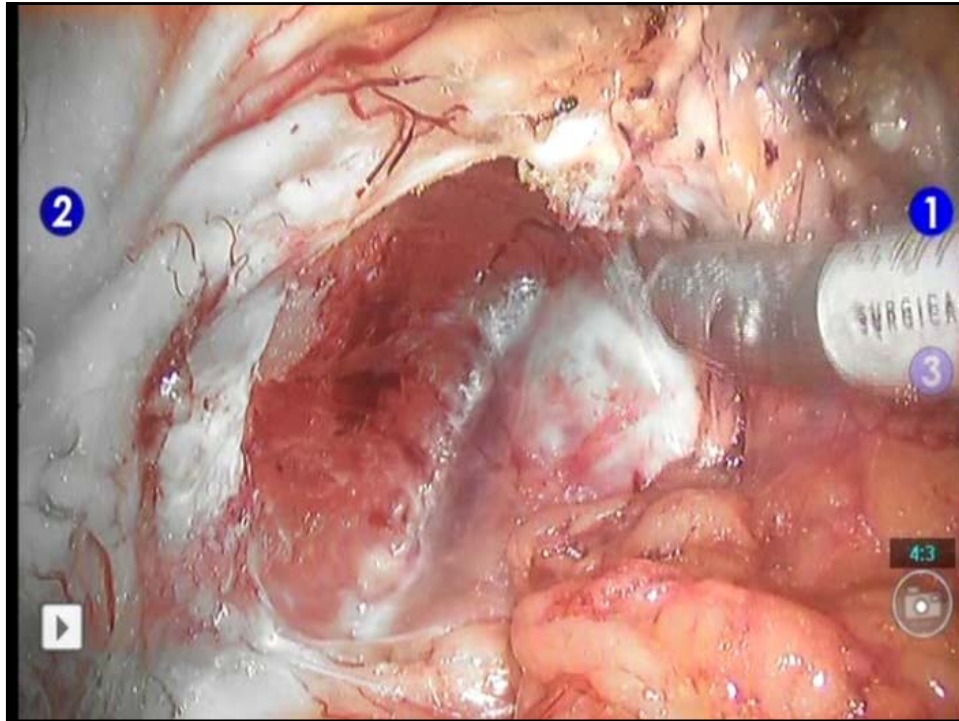


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Robotic Radical Prostatectomy: daVinci Si





Outcomes after RP

- Continence
- Potency
- Cancer control
 - Surgical margins



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Continence* After RALP and Open RP

Reference	No. patients	Continence
Kleinhans (1999)	44	98%
Steiner (2000)	593	95%
Walsh (2000)	64	93%
Bianco (2006)	1472	91%
Tewari (2003)	200	91%
Patel (2005)	200	98%
Esposito (2006)	625	86%
Zorn (2007)	300	90%

*Defined as “no pads” at 12 months



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Functional Outcomes: Continence

- RALP versus Open : single surgeon
- 320 RALP versus 120 Open
- Continence defined as “total control or occasional dribbling”
- At 12 months: 90% versus 88%

Schachter, et al. AUA 2007



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Outcomes after RP

- Continenence
- Potency
- Cancer control
 - Surgical margins



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Potency After RALP and Open RP

Reference	No.	% BNS	Time after OR	Potent
Catalona (1999)	798	86	18 months	68%
Walsh (2000)	64	100	18 months	86%
Graefen (2006)	542	NA	12 months	90%
Eastham (2007)	97	60	6 months	72%
Tewari (2003)	200	100	12 months	84%
Joseph (2006)	150	86	6 months	68%
Esposito (2006)	160	NA	24 months	70%
Zorn (2007)	161	62	12 months	80%



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Outcomes after RP

- Convalescence
- Continence
- Potency
- Cancer control
 - Surgical margins



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Positive Surgical Margins

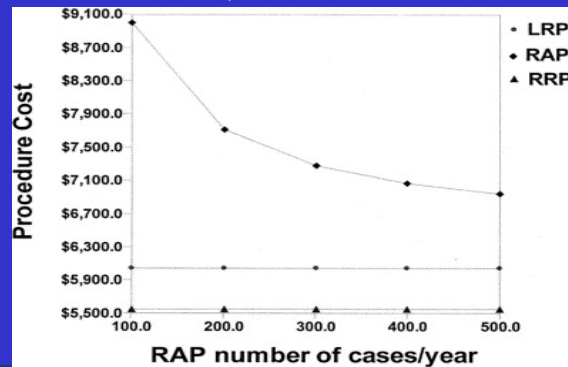
Reference	No.	pT2	pT3
Hull (2002)	1000	13%	
Harris (2003)	508	2%	48%
Touijer (2006)	692	5%	22%
Menon (2003)	100	11%	40%
Menon (2004)	565	23%	
Ahlering (2003)	1-50	27%	50%
	51-140	5%	44%



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Economic Considerations

- Cost advantage of open RP
 - \$487 over laparoscopic RP
 - \$1726 over RALP



Lotan, et al. J Urol 2004; 172: 1431-5



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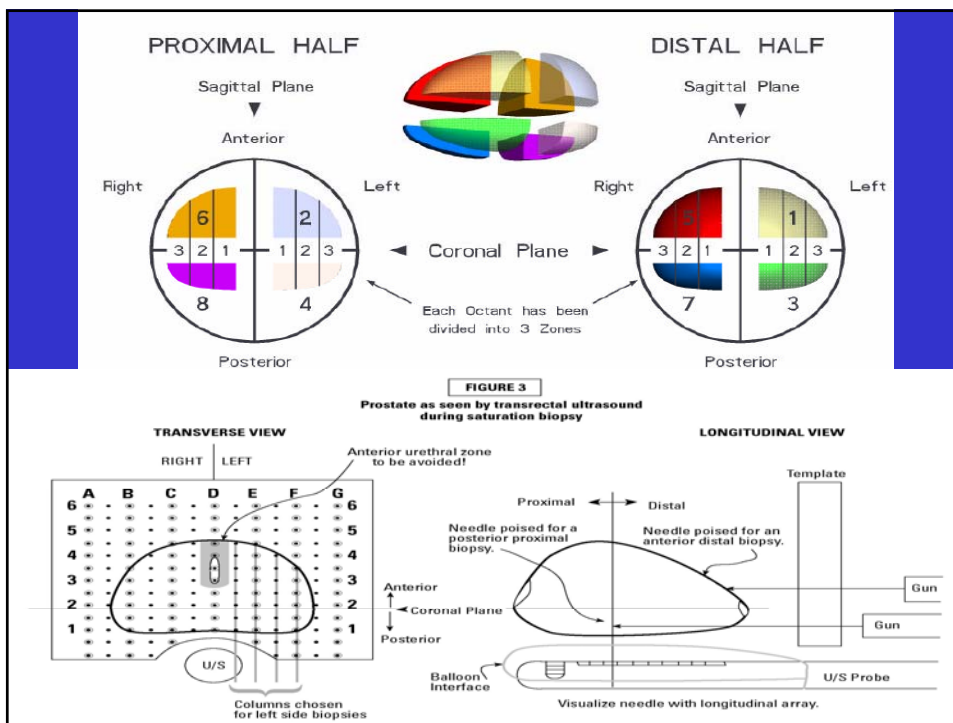
Conclusions: Radical Prostatectomy

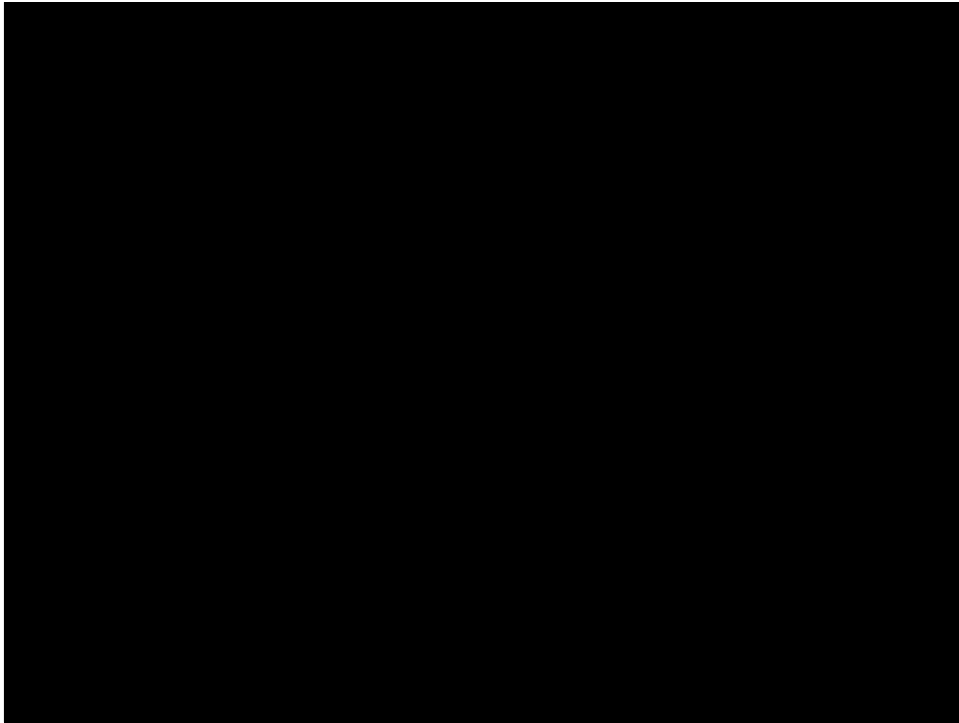
- Most patients are candidates for either RALP or open RP
- Either approach is technically demanding with functional and cancer control outcomes dependent on the skill/experience of the surgeon
- Studies to date have shown that RALP:
 - Results in shorter hospital stay, lower transfusion rates, fewer BNC
 - No advantage in continence and potency (? Inferior results)
- Costs are higher for RALP
 - Initial costs of procedure
 - ? Secondary treatment costs (continence and potency)



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Focal Therapy in Low-risk Prostate Cancer





Focal Cryotherapy Outcomes

- Focal cryoablation is 48 men: mean follow-up: 4.5 yrs
- 45 of 48 patients (94%) have stable PSA levels (ASTRO)
- Of 24 patients who were biopsied all were negative
- Potency was maintained to the satisfaction of the patient in of 36 of 40 patients
- All were continent

Onik et al. Urol Oncol 2008;26(5):500-5



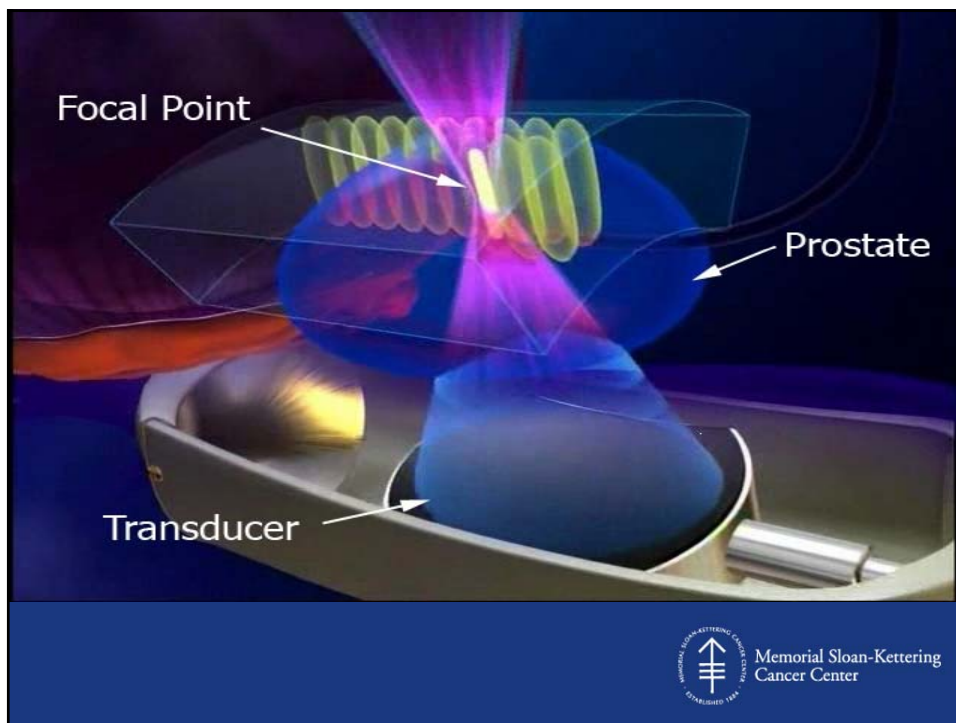
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HIFU

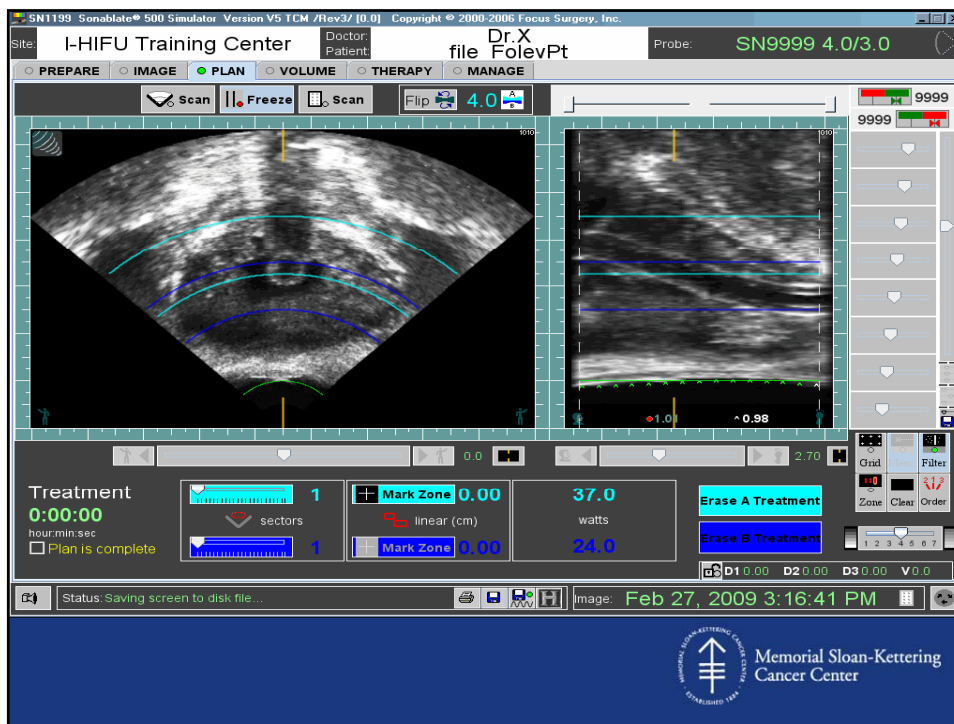
- HIFU, or high intensity focused ultrasound, is a therapy that destroys unhealthy tissue with rapid heat elevation
- Ultrasound energy is focused at a specific location in the body. At that location, or focal point, the temperature rapidly rises to almost 90 degrees Celsius (195 degrees Fahrenheit). Any tissue at the focal point is destroyed

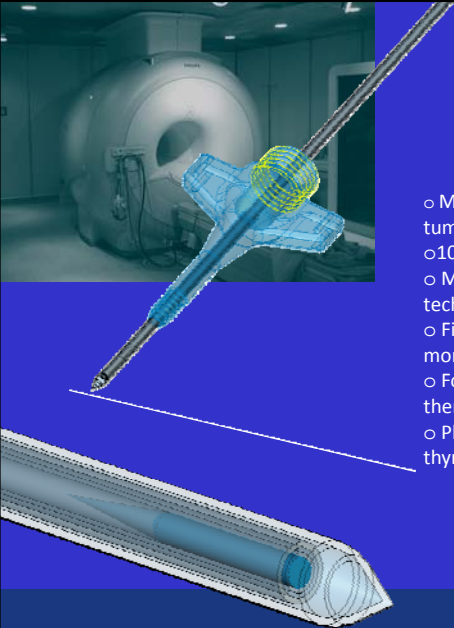


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MRI-guided Focal LASER Therapy

- Minimally invasive laser ablation system for destruction of tumors and other soft tissue
- 100% MR Compatible
- Most controllable, most precise, fastest ablation technology ever introduced
- First and only technology that allows real time thermal monitoring of ablation and modeling of kill zone
- Focus on cancer markets virtually untouched by previous thermal ablative therapies: brain, spine, prostate
- Platform technology with applications in liver, kidney, thyroid, bone, as well as non-cancer applications



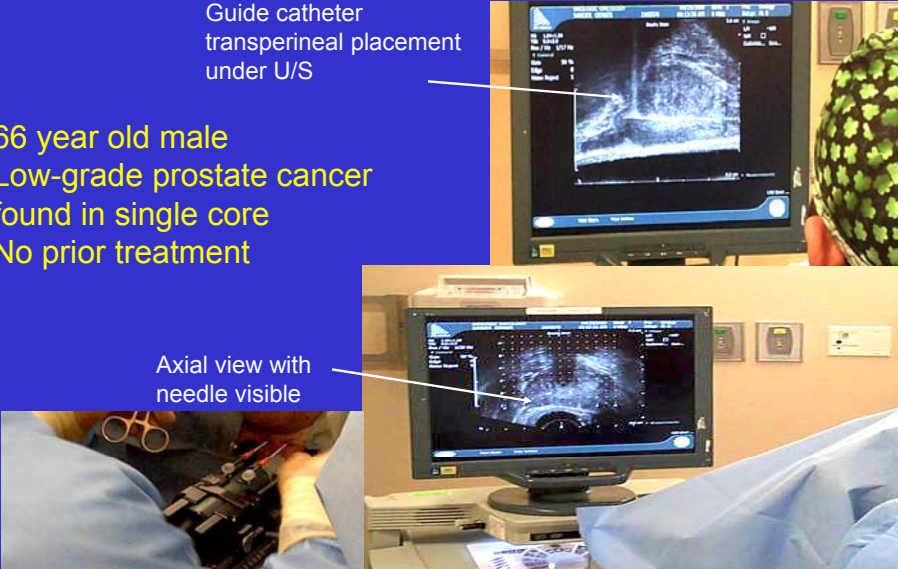
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Visualase Cooled Laser Applicator System (V-CLAS)


Guide catheter transperineal placement under U/S

- 66 year old male
- Low-grade prostate cancer found in single core
- No prior treatment


Axial view with needle visible



The top image shows a longitudinal ultrasound view of the prostate with a guide catheter inserted. The bottom image shows an axial view of the prostate with a needle visible. A person's hand is visible on the right side of the top image, holding a green patterned object.




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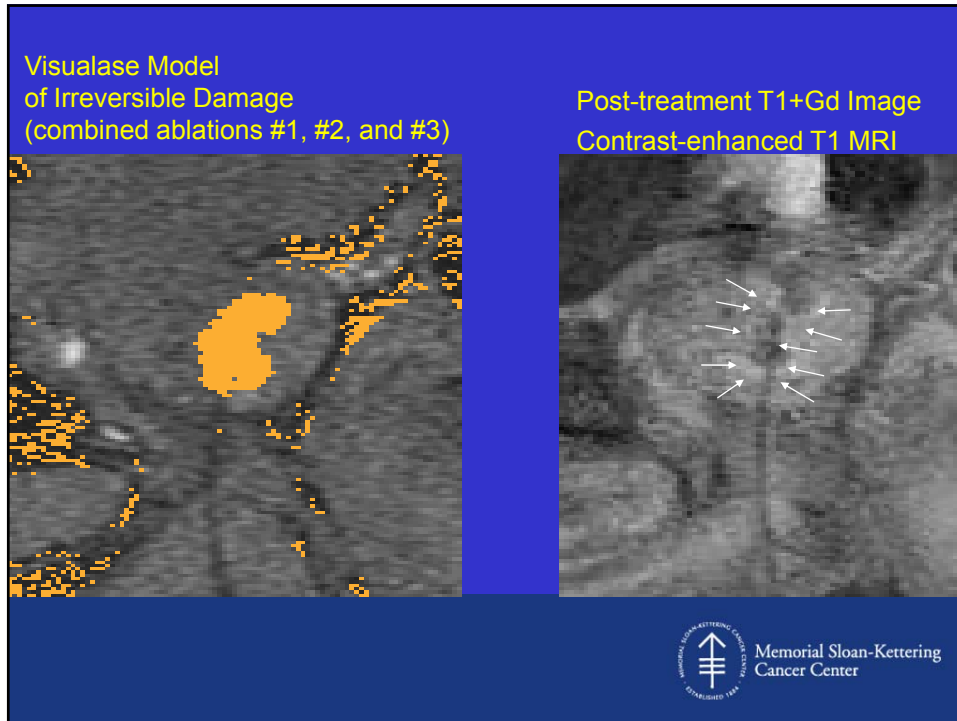


Pre-treatment MRI Shows Applicator placed into Right Lobe of Prostate

The MRI image shows a cross-section of the prostate with three white arrows pointing to a vertical line representing the applicator placed in the right lobe.



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Focal Therapy in Prostate Cancer Conclusions

- Feasible and safe
- Issues
 - Which patient is best suited for focal therapy?
 - What is the best energy source?
 - How should patients be monitored?

Conclusions

- Screening with PSA identifies prostate cancer when it is more likely confined to the prostate
- Radical Prostatectomy has a high likelihood of cure but is technically challenging with results dependent on the surgeon
- New technologies for focal treatment are being developed

