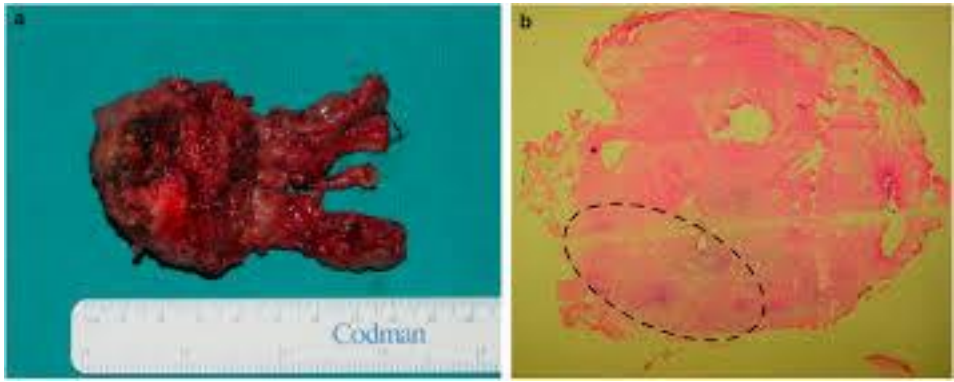
Robotics in Urology



David Lee, MD, FACS

Professor of Urology

Director of Comprehensive Prostate Cancer Program

Back to the Beginning

- Constructed in 1804
- Seats 130 students
- 1840: anesthesia
- 1900: sterile technique
- Surgeons who taught here: Physick, Norris, Pancoast, Agnew, Morton, Bond

What is the Prostate?

- Located between the bladder and the pelvic floor
- About 20g in size
- Functions to produce semen

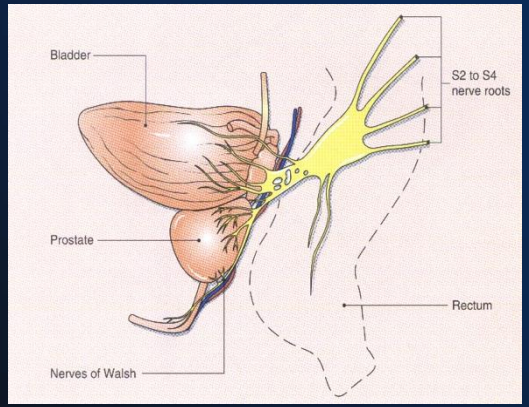


Figure 3. Leading Sites of New Cancer Cases and Deaths – 2021 Estimates

Estimated New Cases

Male			Female		
Prostate	248,530	26%	Breast	281,550	30%
Lung & bronchus	119,100	12%	Lung & bronchus	116,660	13%
Colon & rectum	79,520	8%	Colon & rectum	69,980	8%
Urinary bladder	64,280	7%	Uterine corpus	66,570	7%
Melanoma of the skin	62,260	6%	Melanoma of the skin	43,850	5%
Kidney & renal pelvis	48,780	5%	Non-Hodgkin lymphoma	35,930	4%
Non-Hodgkin lymphoma	45,630	5%	Thyroid	32,130	3%
Oral cavity & pharynx	38,800	4%	Pancreas	28,480	3%
Leukemia	35,530	4%	Kidney & renal pelvis	27,300	3%
Pancreas	31,950	3%	Leukemia	25,560	3%
All sites	**970,250**		**All sites**	**927,910**	

Estimated Deaths

Male			Female		
Lung & bronchus	69,410	22%	Lung & bronchus	62,470	22%
Prostate	34,130	11%	Breast	43,600	15%
Colon & rectum	28,520	9%	Colon & rectum	24,460	8%
Pancreas	25,270	8%	Pancreas	22,950	8%
Liver & intrahepatic bile duct	20,300	6%	Ovary	13,770	5%
Leukemia	13,900	4%	Uterine corpus	12,940	4%
Esophagus	12,410	4%	Liver & intrahepatic bile duct	9,930	3%
Urinary bladder	12,260	4%	Leukemia	9,760	3%
Non-Hodgkin lymphoma	12,170	4%	Non-Hodgkin lymphoma	8,550	3%
Brain & other nervous system	10,500	3%	Brain & other nervous system	8,100	3%
All sites	**319,420**		**All sites**	**289,150**	

Estimates are rounded to the nearest 10, and cases exclude basal cell and squamous cell skin cancers and in situ carcinoma except urinary bladder. Estimates do not include Puerto Rico or other US territories. Ranking is based on modeled projections and may differ from the most recent observed data.

Historical Perspective

1904

Radical perineal prostatectomy: H.H. Young

1947

Radical retropubic prostatectomy: Terrance Millin

1970's

Radical prostatectomy rarely performed, despite excellent cancer control because of side effects:

- Major bleeding
- Impotence (100%)
- Incontinence (10 – 25%)

Radical Retropubic Prostatectomy

- Refined by Dr. Patrick Walsh
- Benefits
  - Excellent nerve sparing ability
  - Acceptable morbidity
  - Access to lymph nodes

Reduction in Morbidity Through Studies of Periprostatic Anatomy

Bleeding: Anatomy of dorsal vein complex and Santorini's plexus not charted.

Impotence: Location of the autonomic innervation to the pelvic organs and corpora cavernosa not known.

Incontinence: Anatomical understanding of sphincter complex was incorrect.

Surgery: Radical Prostatectomy

- Complete removal, can be done open, laparoscopically, or robotic
- Best candidates: >10 yrs life expectancy, more benefit to higher risk
- Benefits: best long term cancer control, can nerve spare
- Cost: most upfront side effects
  - Surgical risks (infection, stricture, DVT, cardiac, etc)
  - Incontinence, impotence

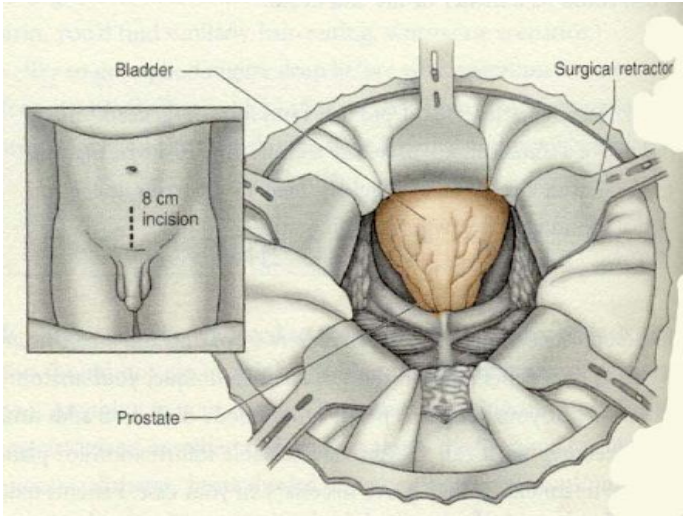


Table 85–9. ESTIMATED BLOOD LOSS IN PATIENTS UNDERGOING RADICAL RETROPUBIC PROSTATECTOMY

Series	No.	Mean Estimated Blood Loss (ml)	Range (ml)
Rainwater and Segura, 1990	316	1020	100–4320
Kavoussi et al, 1991	65*	1420	200–2500
	65†	1605	250–3500
Frazier et al, 1992	122‡	565	150–1850
	51	2000	600–10,000
Leandri et al, 1992	220	300	100–1500
Zincke et al, 1994	1728	600	—
Baylor (unpublished data)	954	800	150–5000

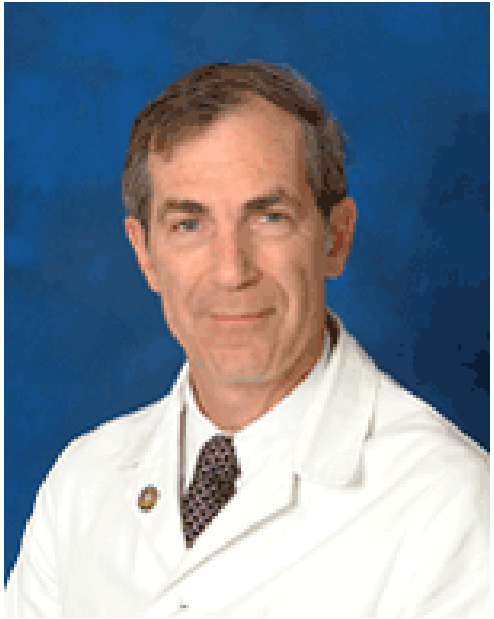
*With temporary internal iliac artery occlusion.
†Without temporary internal iliac artery occlusion.
‡Radical perineal prostatectomy.

Improvement through Approach

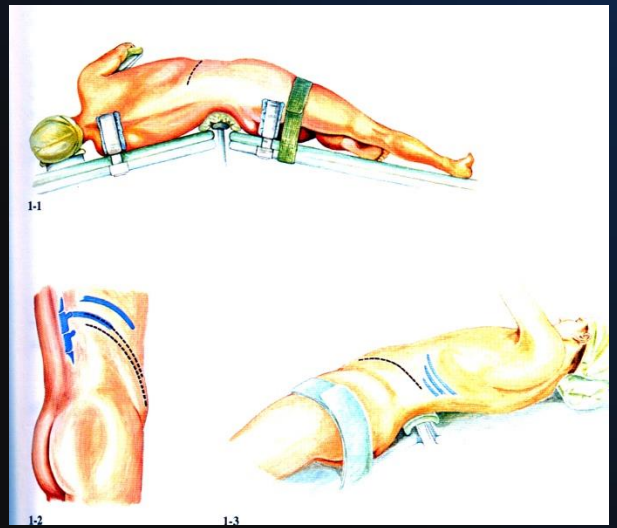
Dr. Clayman performed the first laparoscopic nephrectomy in 1991

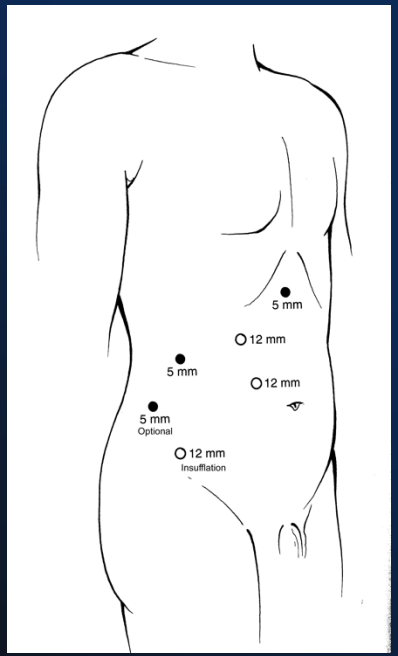
Benefits of improved recovery while still meeting oncological outcomes

Prostatectomy proved more difficult



What would you want?





Benefits of Laparoscopic Nephrectomy

- Dunn reported on 9 year experience
- Blood loss 172 vs 451 cc
- Hospital stay 3.4 vs 5.2 days
- Pain meds 28 vs 78 mgs morphine
- Return to normal recovery 3.6 vs 8.1 wks
- Cancer control was the same

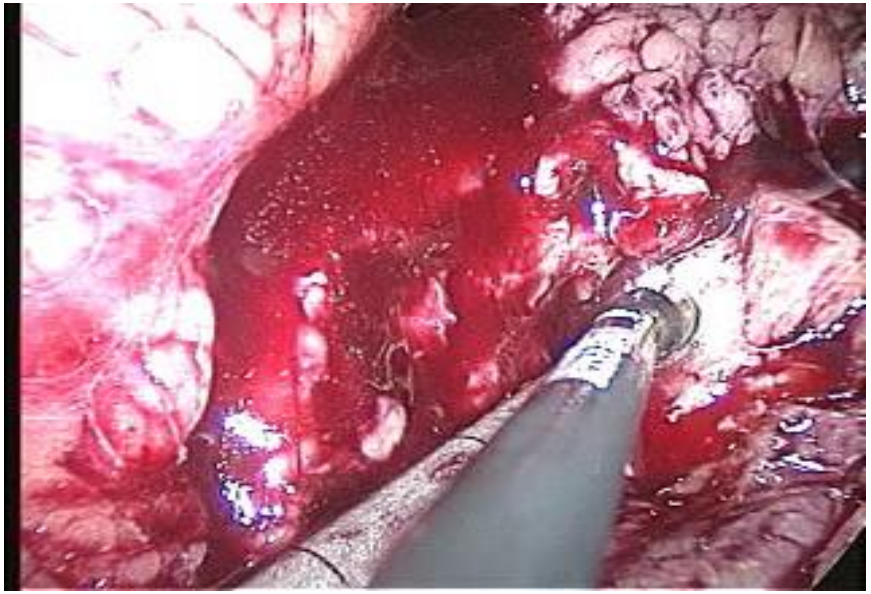
Dunn, MD, et al. J Urol, 164, 1153, 2000

Laparoscopic Partial Nephrectomy

Performed at specialized centers

Indicated for tumors less than 4 cm in size

Challenging because of vascular supply of kidney



Evolution to Robot Prostatectomy

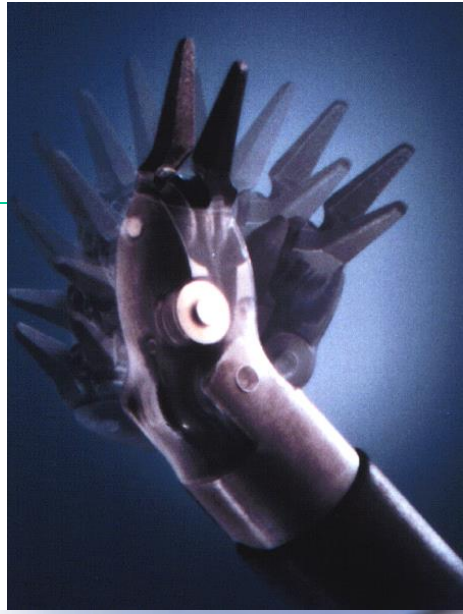
Nerve Sparing Prostatectomy 1983

Laparoscopic Prostatectomy 2000

Vattikuti Institute Prostatectomy 2001
Veil of Aphrodite 2002

UCI Health

Da Vinci Robotic Surgical System



Seven degrees of freedom = human wrist at the tip of the instrument!

Better Instrument Selection

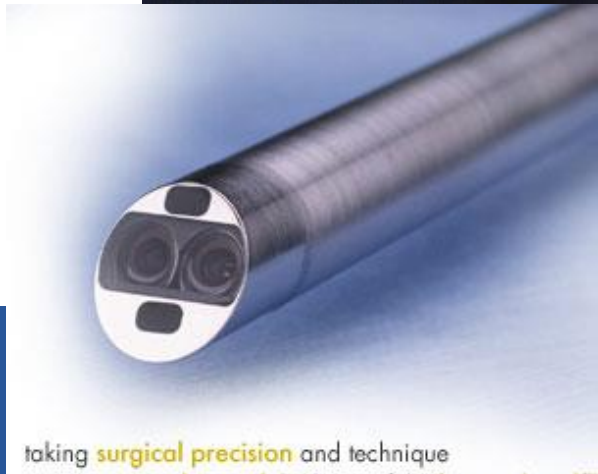
Filters hand tremor

Motion scaling 1:5

10 to 12 x magnification

3D vision

Ergonomic surgeon's console



Robotic Revelation: Laparoscopic Radical Prostatectomy by a Nonlaparoscopic Surgeon

Elise Perer, MD, David I Lee, MD, Thomas Ahlering, MD, FACS, Ralph V Clayman, MD, FACS

In most areas of surgery, minimally invasive procedures have made significant inroads because of major advances in the realm of laparoscopy. But laparoscopic surgery is an entirely new skill to be learned by the well-trained open surgeon. For the classically trained open surgeon, the drawbacks to laparoscopy are many: two-dimensional view, disjunction between the actual surgical field and the view of the surgeon (ie, the television screen is not aligned with the actual surgical field), poor haptic feedback, inability of the surgeon to physically control the view of the surgical field, and the need for continual counterintuitive movement of instruments in order to access the surgical site. Given these substantial hurdles, many urologic surgeons have elected to shun laparoscopic surgery, awaiting further proof of benefit or a less rigorous alternative.

Recently, two three-armed robotic systems have become available that provide the surgeon with both control of the camera and the two working ports. One of

sary. But the current model of the da Vinci robot truly mimics the movements made during standard open surgery, raising the question: Using the da Vinci robot as an interface, does an accomplished open surgeon still require intense training in laparoscopy in order to perform a complex laparoscopic procedure? Herein we report the successful completion of a robotic laparoscopic prostatectomy by an experienced open surgeon with no formal basic or standard laparoscopic training.

Experience and background

In May 2002, a da Vinci robotic system (Fig. 1) was obtained at the University of California, Irvine Medical Center. At that time, the operating and assistant surgeons (TA and RVC, respectively) underwent training on the robot. The surgeon (TA), with no previous laparoscopic training or experience, is a fellowship-trained urologic oncologist and has performed more than 500 open radical retropubic prostatectomies. The assistant

JACS 197:693; 2003

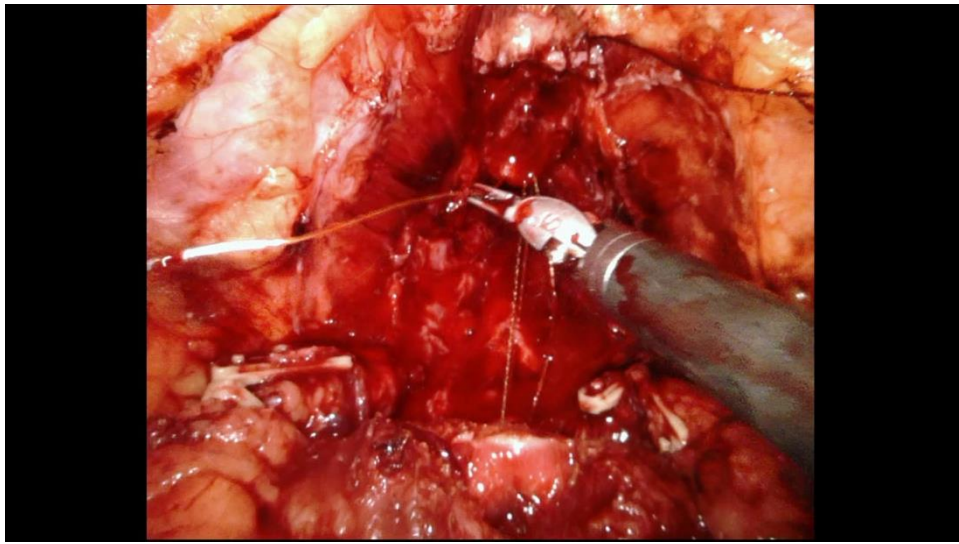
UCI Health

ROBOTIC PROSTATECTOMY RESULTS

Cases	7000+
EBL	134 cc
OR time (min)	145 (117)
Conversions	0%
Transfusions	0.2%

Robot Assisted Radical Prostatectomy

- > 90% of all cases in US
- Best for <10yr life expectancy
- Best long term cancer cure, can nerve spare
- Most side effects upfront
- Improved recovery over open
- OUTPATIENT



HENRY FORD: OPEN vs. VIP

Variables	Open	VIP
OR time	163 min	0.91
EBL	910 cc	0.1
Positive margins	23%	1
Complications	15%	0.33
Cath time	15.8d	0.44
Hospital >24 hrs	100%	0.07
Postop pain	7	0.45
Continence	160d	0.28
Erection	440d	0.4
Intercourse	>700d	0.5

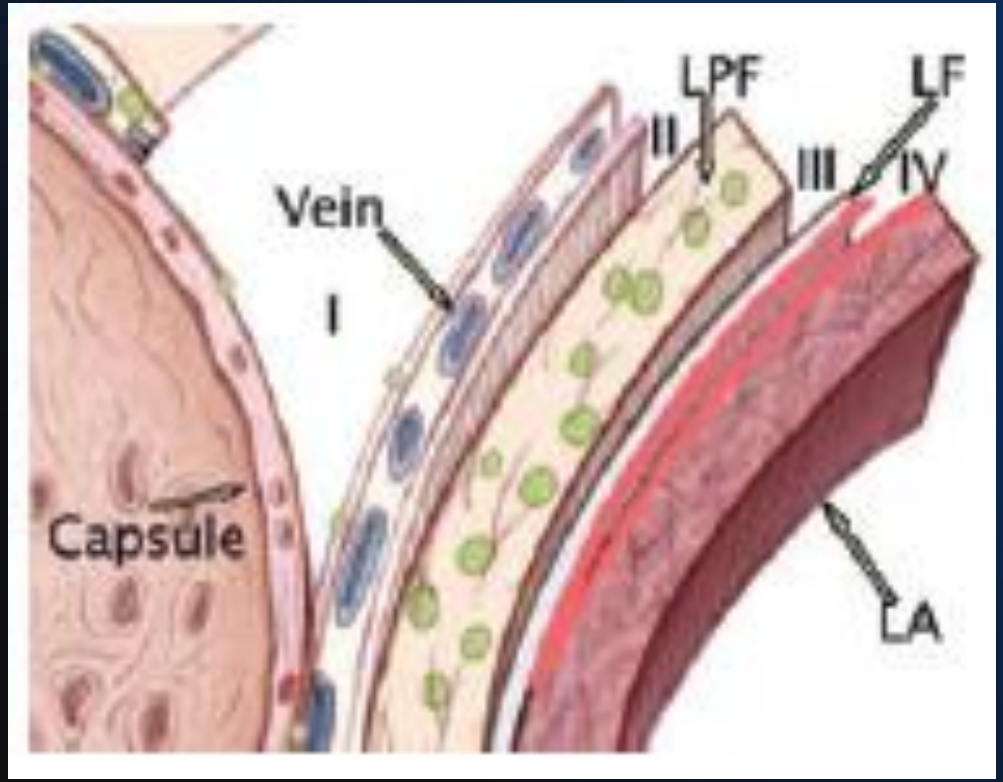
Menon, M, et al. Urol Clin N Am 31(2004) 701-717

Increasing Experience

- Badani, et al, presented the VIP series of 2766 cases
- 5 year actuarial BCR free rate of 84%
- Continence: 0.8% severe incontinence
- Potency: 93% intercourse (51% baseline)
- Margin rate: 13% overall

Badani KK, et al. Cancer. 2007 Nov 1;110(9):1951-8.

Layers of Nerve Sparing



Perioperative Outcomes of Robot-Assisted Radical Prostatectomy Compared With Open Radical Prostatectomy: Results From the Nationwide Inpatient Sample

Quoc-Dien Trinh [a,b,,1], Jesse Sammon [a,1], Maxine Sun [b], Praful Ravi [c], Khurshid R. Ghani [a], Marco Bianchi [d], Wooju Jeong [a], Shahrokh F. Shariat [e], Jens Hansen [f], Jan Schmitges [f], Claudio Jeldres [b], Craig G. Rogers [a], James O. Peabody [a], Francesco Montorsi [d], Mani Menon [a], Pierre I. Karakiewicz [b]*

- 10/08, robotic modifier code established
- Exam of 19462 pts (10/08-12/09) from the Nationwide Inpatient Sample
- Lower blood transfusion rate (OR .34), intraop complication rate (.47), or pLOS (.28)

Table 4 – Propensity score–matched intraoperative and postoperative outcomes during hospitalization stratified by open or robotic surgery

	Open, *n* = 7389	Robotic, *n* = 7598	Robotic vs open, odds ratio (95% CI)	*p* value
Homologous blood transfusion, *n* (%)	572 (7.7)	184 (2.4)	0.30 (0.25–0.35)	**<0.001**
Intraoperative complication, *n* (%)	73 (1.0)	33 (0.4)	0.44 (0.29–0.66)	**<0.001**
Postoperative complication,* *n* (%)				
Overall	823 (11.1)	705 (9.3)	0.82 (0.73–0.91)	**<0.001**
Cardiac	96 (1.3)	68 (0.9)	0.69 (0.5–0.94)	**0.018**
Respiratory	191 (2.6)	105 (1.4)	0.53 (0.42–0.67)	**<0.001**
Vascular	45 (0.6)	30 (0.4)	0.65 (0.41–1.03)	0.065
Operative wound	48 (0.6)	35 (0.5)	0.71 (0.46–1.1)	0.121
Genitourinary	86 (1.2)	90 (1.2)	1.02 (0.76–1.37)	0.907
Miscellaneous medical	459 (6.2)	432 (5.7)	0.91 (0.79–1.04)	0.173
Miscellaneous surgical	121 (1.6)	122 (1.6)	0.98 (0.76–1.26)	0.877
Length of stay >2 d, *n* (%)	2923 (39.6)	1105 (14.5)	0.26 (0.24–0.28)	**<0.001**
In-hospital mortality, *n* (%)	6 (0.1)	1 (0.0)	0.16 (0.02–1.35)	0.092

CI = confidence interval.

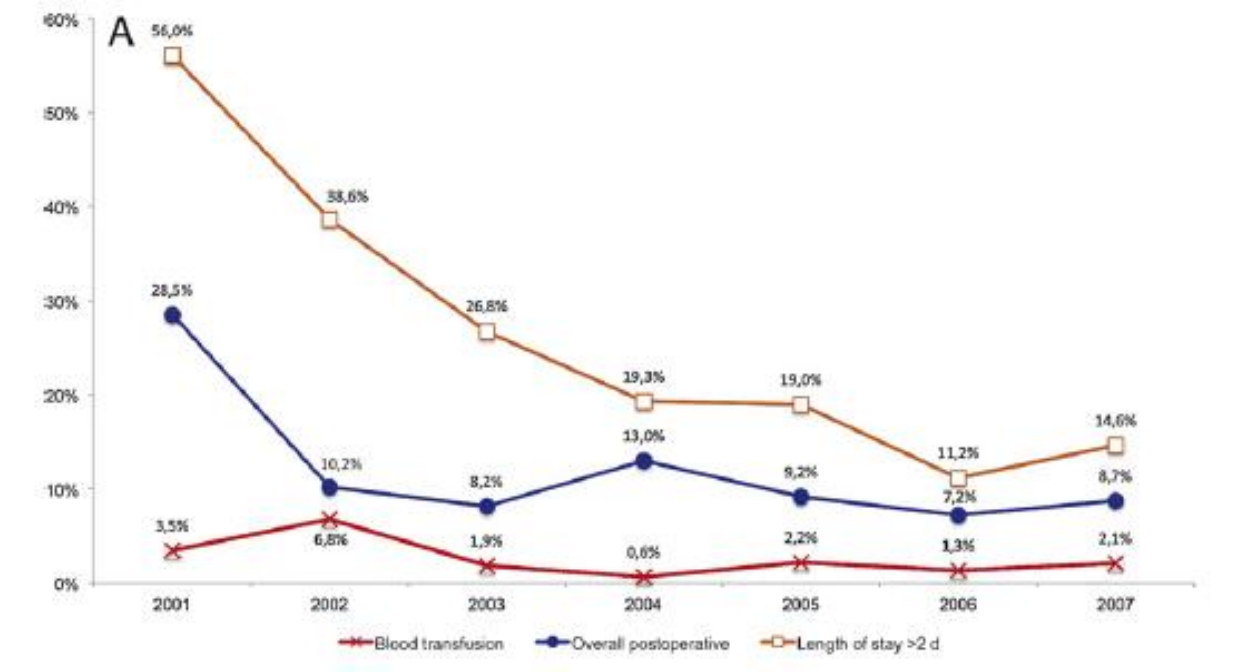
* Rates of complication are not additive, as patients may have had multiple complications.

A Population-Based Analysis of Temporal Perioperative Complication Rates After Minimally Invasive Radical Prostatectomy

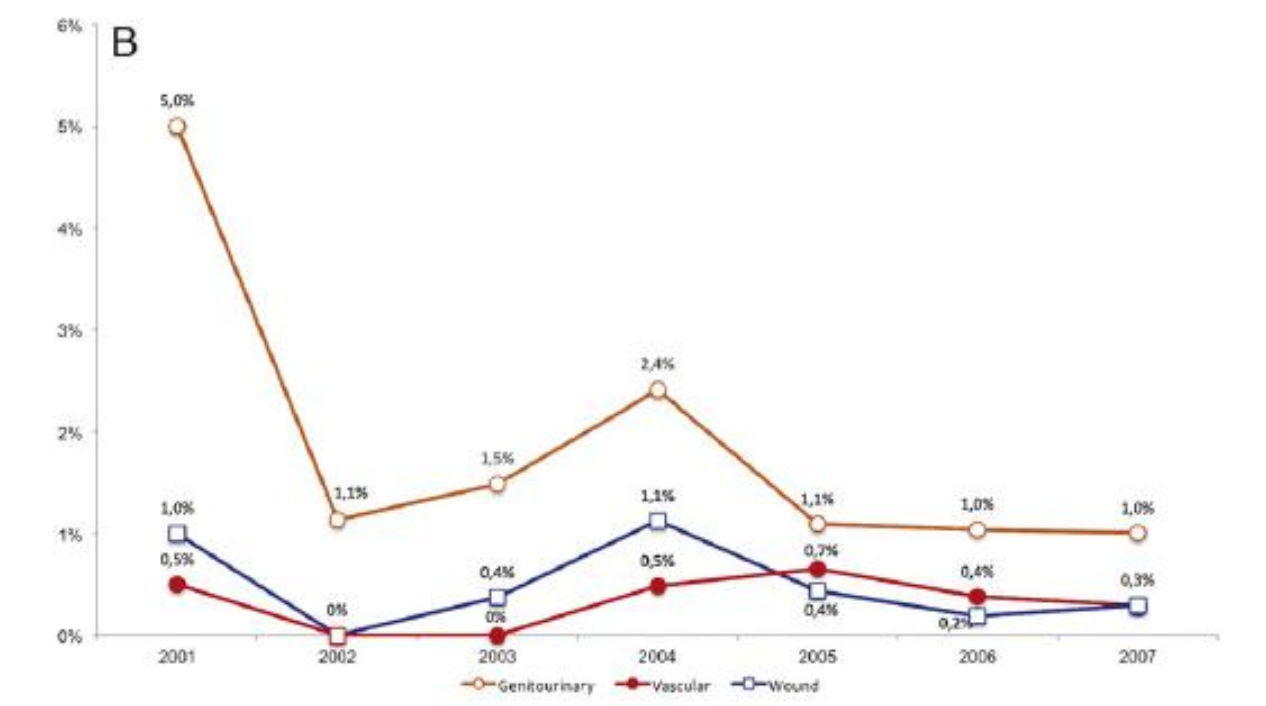
Jan Schmitges [a,b,1,], Quoc-Dien Trinh [b,c,1], Firas Abdollah [d], Maxine Sun [b], Marco Bianchi [d], Lars Budäus [e], Kevin Zorn [b,f], Paul Perotte [b,f], Thorsten Schlomm [a], Alexander Haese [a], Francesco Montorsi [d], Mani Menon [c], Markus Graefen [a], Pierre I. Karakiewicz [b,f]*

- Examination of NIS
- Stratified by year to look at: complications, mortality, hospital stay
- Overall patients: 4387 from 2001-2007

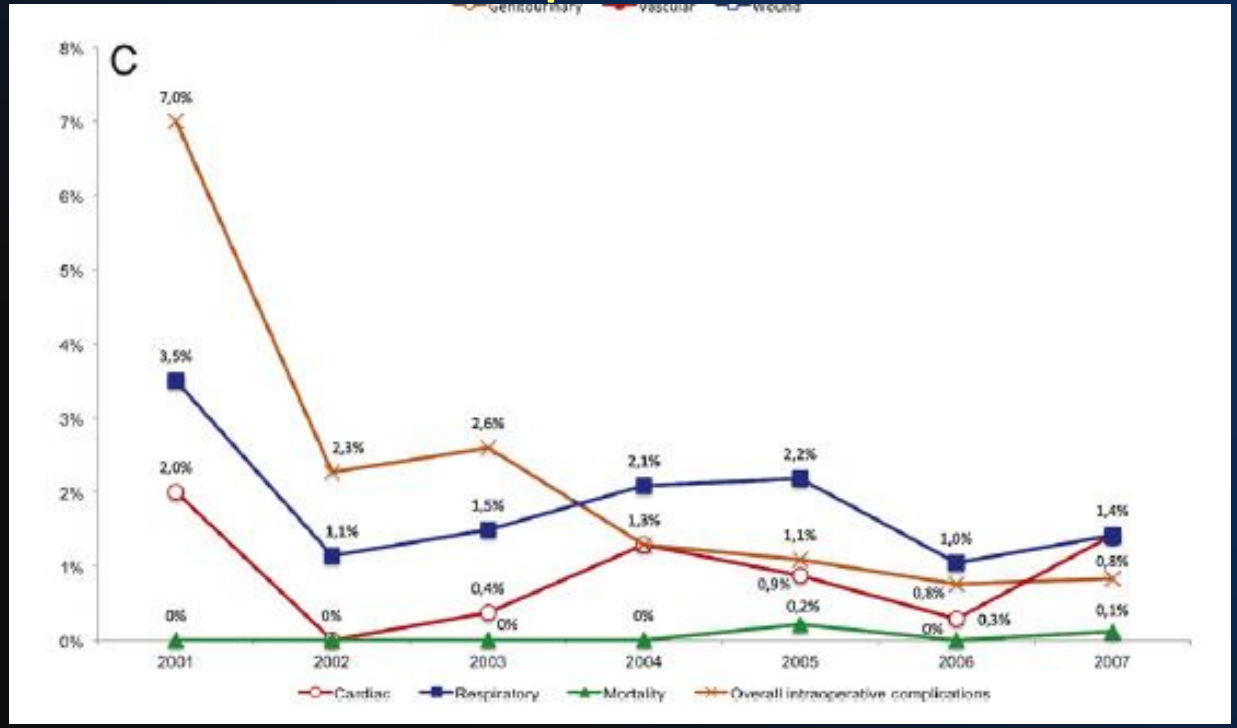
Transfusion, Overall, LOS



GU, Vascular, Wound Complications



Cardiac, Resp, Mortality, Overall Complications



Bowel, Ureteral, Vessel Injury

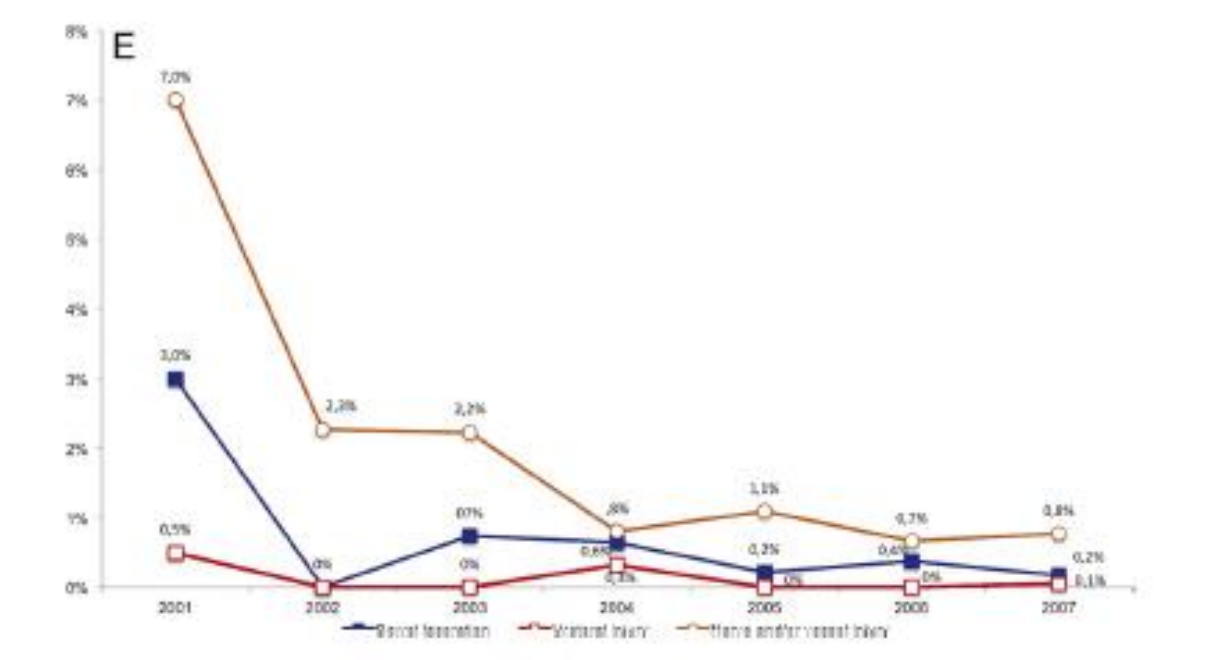


Table 3 – Multivariable analyses testing the effect of time period on adverse outcomes during the entire study period and after exclusion of year 2001

Outcomes	2006–2007 vs 2001–2005 (95% CI)*	p	2006–2007 vs 2002–2005 (95% CI)*	p
Blood transfusion	0.89 (0.44–1.79)	0.7	0.93 (0.45–1.90)	0.84
Intraoperative complication				
Overall	0.41 (0.23–0.72)	0.002	0.51 (0.29–0.87)	0.014
Bowel laceration	–	–	–	–
Ureteral injury	–	–	–	–
Nerve and/or vessel injury	0.41 (0.22–0.75)	0.004	0.54 (0.31–0.96)	0.035
Postoperative complication				
Overall	0.65 (0.48–0.89)	0.007	0.76 (0.55–1.04)	0.080
Cardiac	0.82 (0.41–1.65)	0.6	0.97 (0.47–2.01)	0.94
Respiratory	0.66 (0.40–1.13)	0.1	0.74 (0.43–1.27)	0.27
Genitourinary	0.54 (0.32–0.92)	0.02	0.58 (0.32–1.04)	0.065
Wound	–	–	–	–
Vascular	–	–	–	–
Miscellaneous medical	0.76 (0.50–1.16)	0.2	0.92 (0.57–1.48)	0.72
Miscellaneous surgical	0.60 (0.42–0.87)	0.007	0.72 (0.50–1.04)	0.081
Length of stay >2 d	0.34 (0.20–0.58)	<0.001	0.49 (0.30–0.80)	0.004
In-hospital mortality	–	–	–	–

CI = confidence interval.

* Model adjusted for age, race, and baseline Charlson Comorbidity Index, hospital academic status, hospital region, and annual hospital caseload.

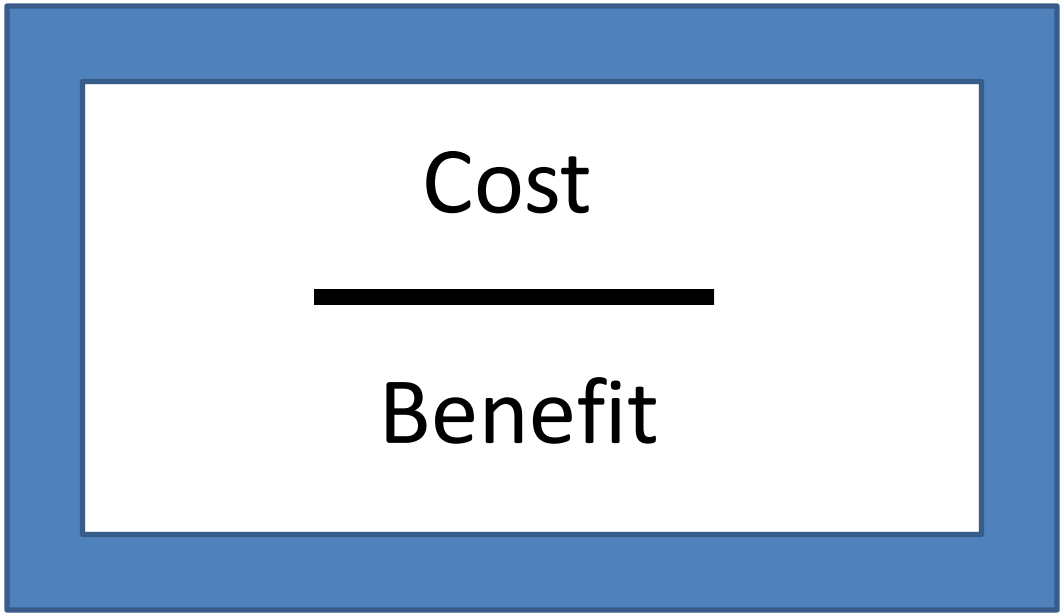
– Model could not converge due to insufficient number of events.

Prostate Cancer Paradigm

- Usually detected through PSA blood test
- Lack of symptoms is typical
- Diagnosis and treatment can run completely through the urologist
- Difficult cases do require the teamwork of radiation oncology and medical oncology

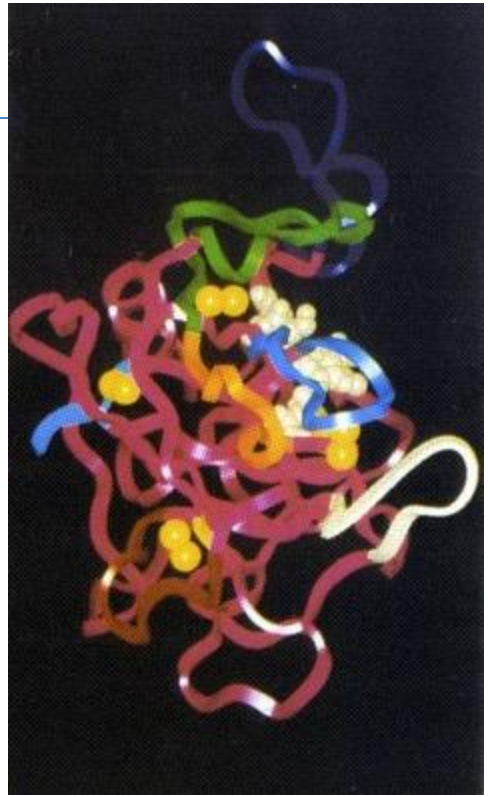
Factors for Decision Making

- Age/life expectancy
- Medical/surgical history
- Clinical stage
- PSA
- Biopsy
  - Gleason score
  - Number of cores +
  - Percent +
- Imaging
- Genomic testing



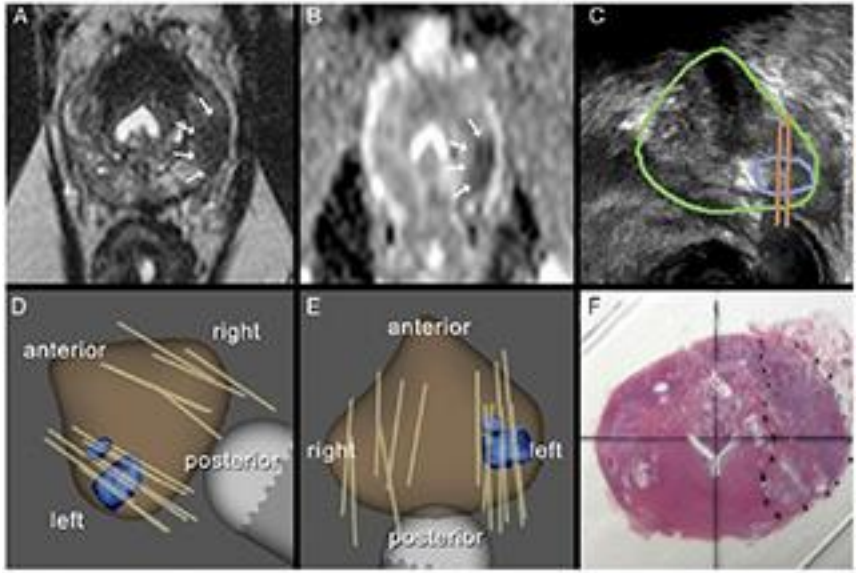
What is PSA?

- Blood test determines the risk for having prostate cancer
- Combined with the digital rectal examination determines the need for biopsy
- New tools: blood tests (%free PSA, 4K score), urine tests (ExoDX)
- PSA saves lives!!!



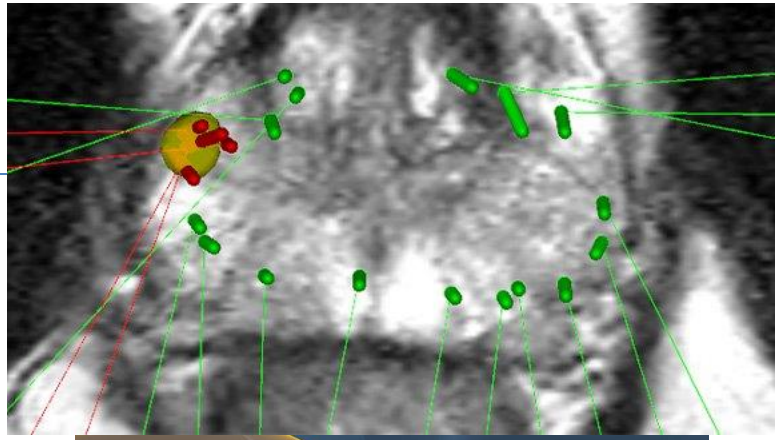
MRI/US fusion biopsy

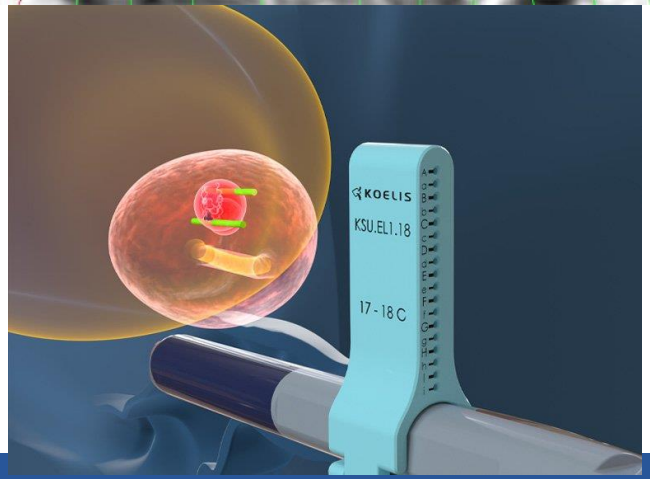
- MRI being used as decision tool to help avoid biopsies
- Teamed up with software, can greatly increase accuracy of biopsy
- Preoperatively helps with nerve sparing/improving margin status



Transperineal Biopsy

- No sepsis risk
- Higher cancer yield from biopsy
- MRI/US targeting





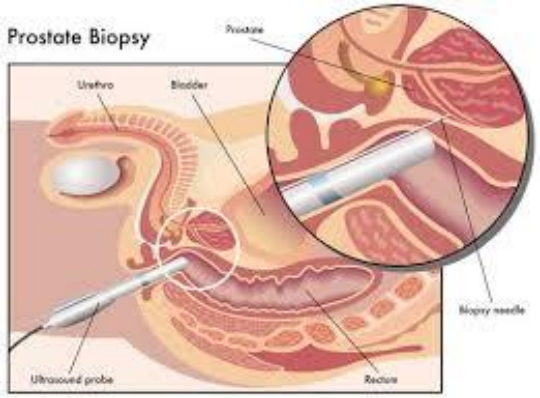
Principles

- Low risk: strongly consider AS
- Intermediate: surgery or radiation
- High risk: surgery or radiation

- Longer life expectancy should consider definitive treatment
- Limited life expectancy can consider AS

Active Surveillance

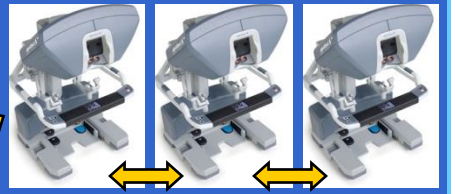
- Thoughtful monitoring via periodic PSA, DRE, biopsy and MRI
- Best candidates: low risk disease
- Typical criteria: Gleason 6, low number of
- cores + and low %
- Benefit: maintain best quality of life
- Cost: anxiety, long term costs, complications



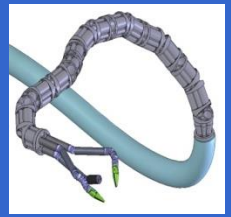
Future Direction and Concepts

Image Guidance *

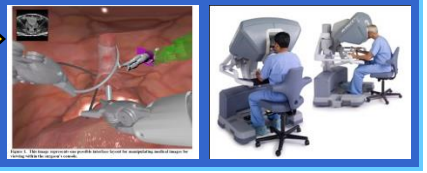
dV Network *



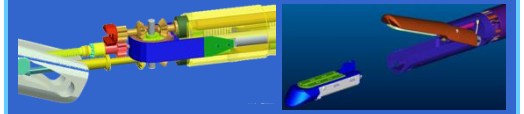
Future Tissue Interaction Concepts *



Training *



Advanced Instrumentation *



** Not FDA approved*

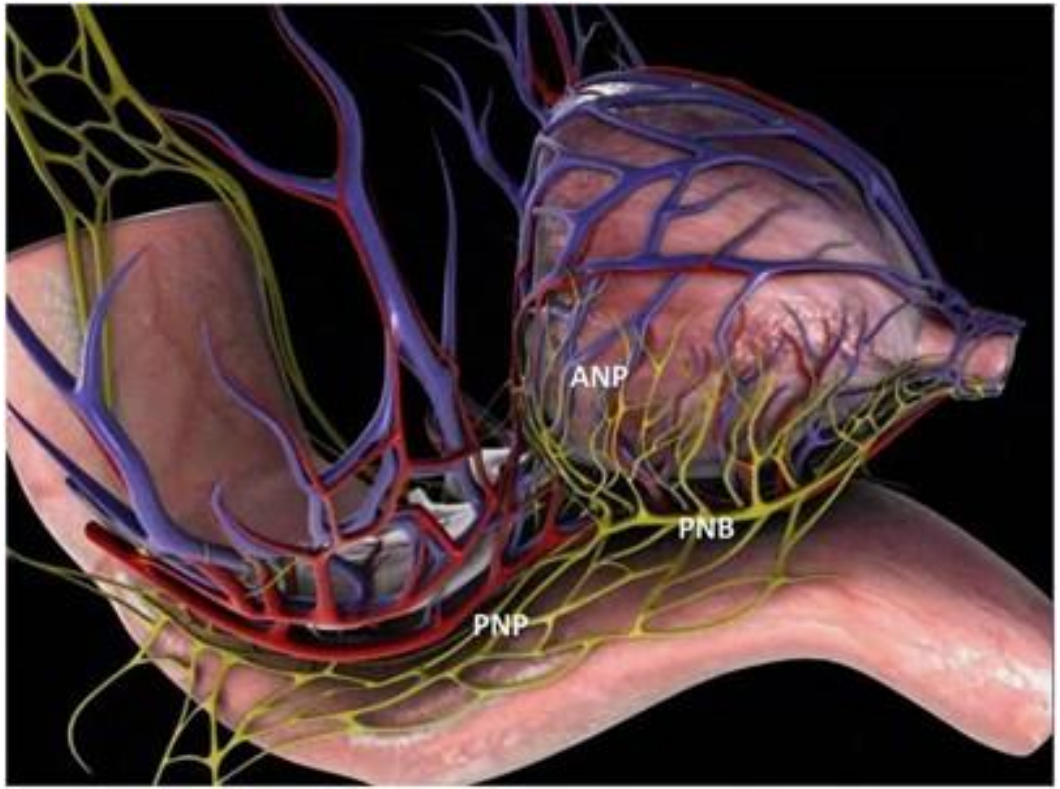
INTUITIVE SURGICAL®

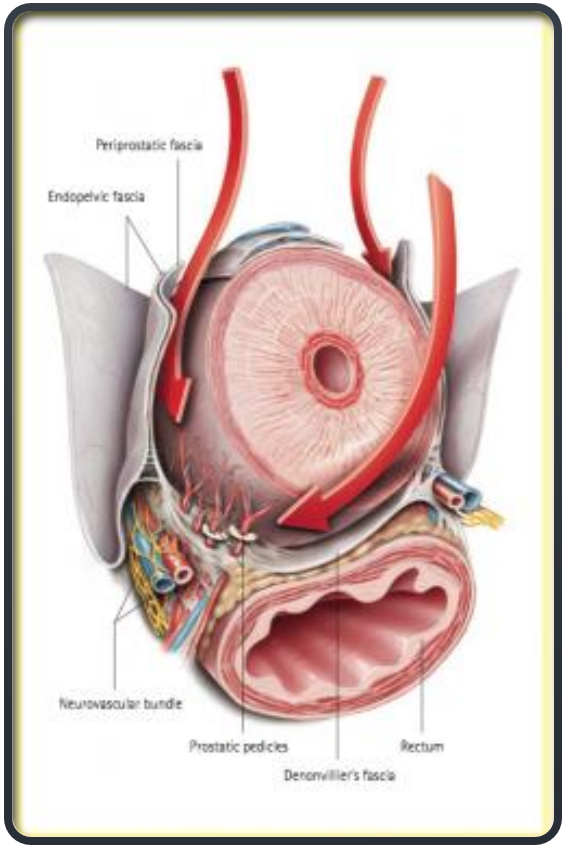
>7000 dV Cases

The technology keeps getting better!

UCI Urology

The Prostate and Potency

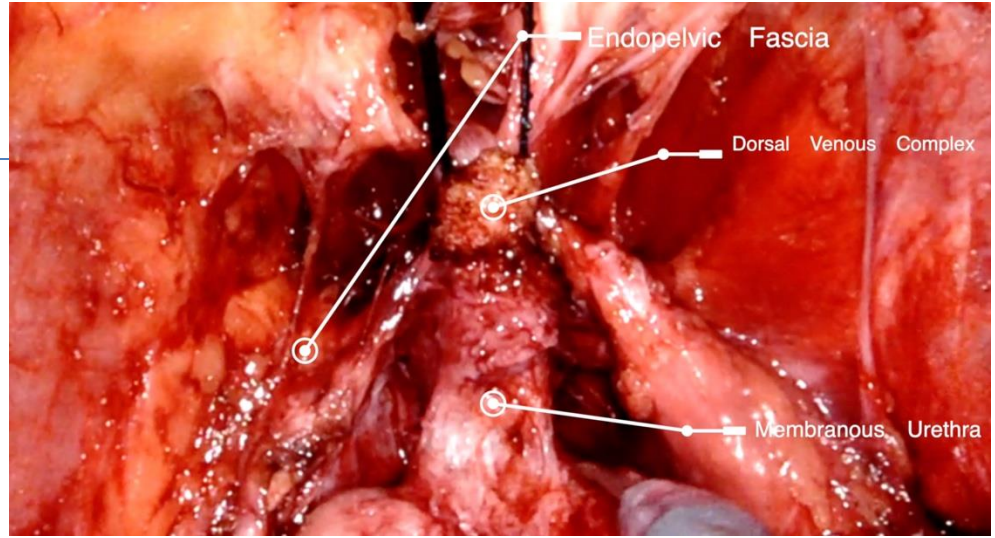




UCI Department of Urology

Hood Technique

- Preservation of additional tissue around apex and lateral sides of prostate

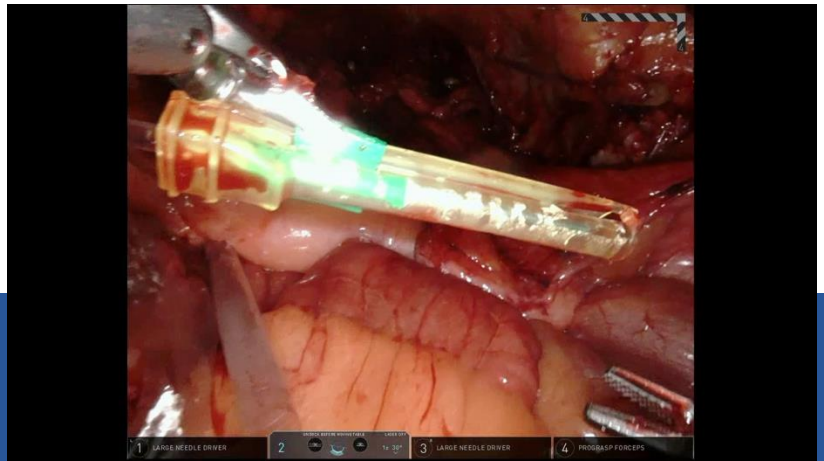


Functional Outcomes at 3 months:			
Pads, n(%)			
0-1 security pad	82 (66.1%)	89 (78.1%)	0.041
2 or more pads	42 (33.9%)	25 (21.9%)	
AUASS, median (IQR)	7 (2.5 – 14)	6 (4 – 9)	0.898
SHIM, median (IQR)	5 (3 – 15.5)	10 (3.25 – 20)	0.004
Percentage fullness of erection, %, median (IQR)	50 (15 – 80)	50 (20 – 80)	0.949
If only preop>18 SHIM cases selected:			
SHIM, median (IQR)	8 (4 – 20)	18 (6 – 23)	0.044

UCI Health

OUTPATIENT

- Effect of COVID
- ERAS protocol
- TAP block



Operation time, mins, mean ± SD	143.2 ± 26.4
Console time, mins, mean ± SD	92.8 ± 26.7
Dissection time, mins, mean ± SD	44.4 ± 15.7
EBL, mL, median (IQR)	50 (50 – 100)
LOS, mins, median (IQR)	159.6 ± 63.5
Pain score 1 hour after surgery, median (IQR)	3 (0 – 7)
Pain score at discharge time, median (IQR)	2 (0 – 3.75)
Postop opioid use, n (%)	
Yes	27 (30.7%)
No	61 (69.3%)
Chronic opioid user, n (%)	
Yes	7 (7.5%)
No	86 (92.5%)
Length of catheterization, days, median (IQR)	7 (7 – 8)
Visits to urology clinic/ED during the 1st week after surgery, n (%)	14 (7.7%)
Calls/messages to providers during the 1st week after surgery, n (%)	43 (23.8%)
Readmission in 30 days, n (%)	16 (8.8%)
Readmission in 90 days, n (%)	18 (9.9%)
Pads at 3 months, n (%):	
0-1 security pad	123 (76.9%)
2 or more pads	37 (23.1%)

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SP Robot

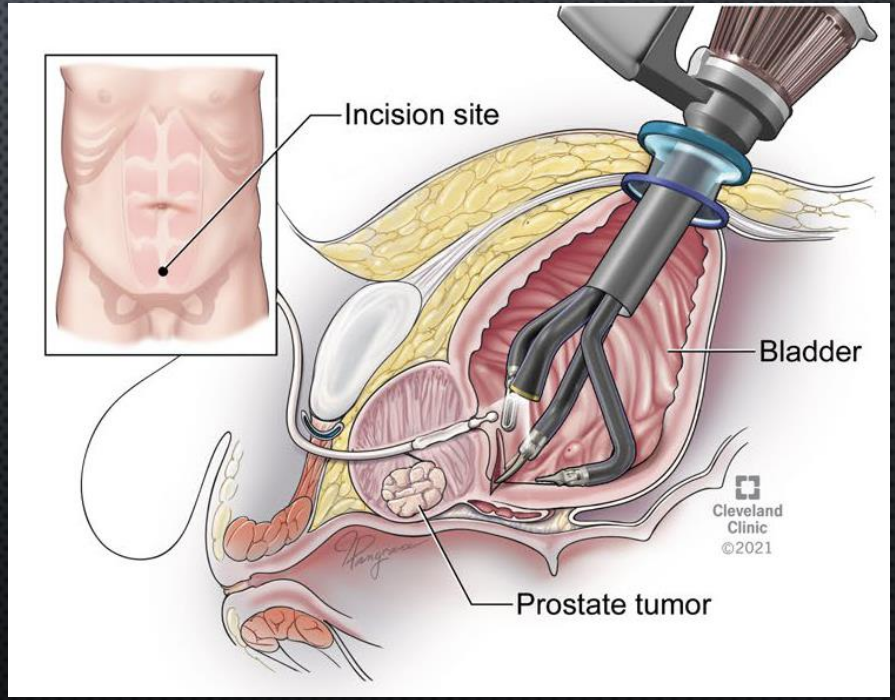
UCI Department of Urology

Transvesical versus extraperitoneal single-port robotic radical prostatectomy: a matched-pair analysis

Mahmoud Abou Zeinab[1] · Alp Tuna Beksac[1] · Ethan Ferguson[1] · Aaron Kaviani[1] · Jihad Kaouk[1]

- Matched paired analysis
- 78 SP TVRP vs 169 SP ERP
- OR times longer, shorter cath time
- No difference in margins
- Trend toward fewer complications
- Improved continence 97vs81% @3m

World Journal of Urology 2022, 40:2001



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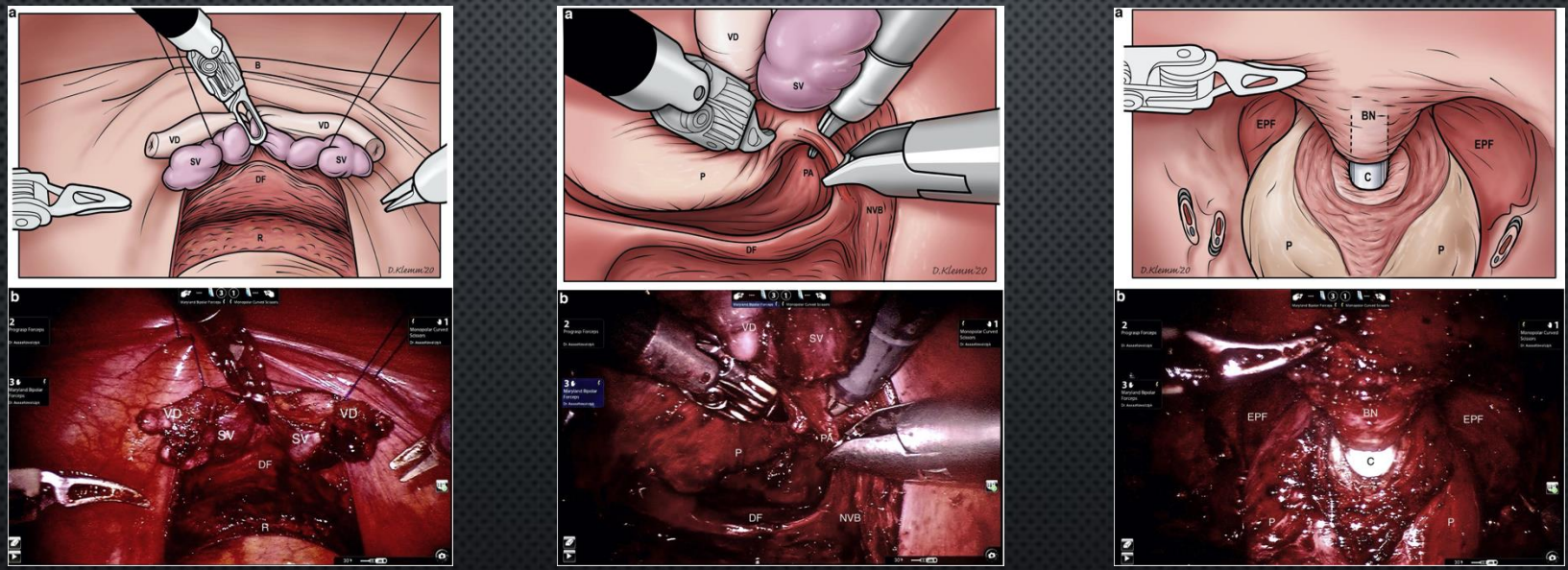
RETZIUS SPARING ROBOT PROSTATECTOMY



European Urology 79, 839, 2021

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Table 3 – Pathologic and oncologic data.

	RS-RARP (*N* = 70)	S-RARP (*N* = 70)	*p* value
Gleason group, mean ± SD	2.6 ± 0.7	2.2 ± 1.2	0.062
Prostate weight (g), mean ± SD	43.7 ± 18.8	47.6 ± 16.0	0.183
Pathologic stage, no. (%)			
T2	47 (67.1)	48 (68.6)	0.842
T3a	14 (20.0)	15 (21.4)	
T3b	9 (12.9)	7 (10.0)	
Lymph node involvement, no. (%)	1 (1.4)	3 (4.3)	0.314
Positive margin, no. (%)	24 (34.3)	21 (30.0)	0.590
Focal	19 (27.1)	15 (21.4)	0.434
Nonfocal	5 (7.1)	6 (8.6)	0.016
Margin location, no. (%)			
Posterior	9 (39.1)	12 (70.6)	0.125
Anterior	12 (52.2)	5 (29.4)	
Apex	6 (26.1)	6 (33.3)	
Biochemical recurrence, no. (%)	9 (12.9)	13 (18.6)	0.357
Time to BCR (d), median (IQR)	78 (58–270)	248 (148–388)	0.193
Adjuvant therapy, no. (%)	13 (18.6)	15 (21.4)	0.675
Pentafecta, no. (%)	35 (50.0)	35 (50.0)	1.000

BCR = biochemical recurrence; IQR = interquartile range; RS-RARP = Retzius-sparing robot-assisted radical prostatectomy; SD = standard deviation; S-RARP = standard robot-assisted radical prostatectomy.

Table 4 – Continence and potency outcomes.

	RS-RARP (*N* = 70)	S-RARP (*N* = 70)	*p* value
Overall continence at follow-up, no. (%)			
0 pads	47 (67.1)	47 (67.1)	1.000
0–1 safety pad	67 (95.7)	60 (85.7)	0.042
Continence at 12 mo, no. (%) [a]			
0 pads	30 (73.2)	46 (65.7)	0.341
0–1 safety pad	40 (97.6)	57 (81.4)	0.002
Time to continence (d), median (IQR)			
0 pads	59 (17–137)	182 (105–273)	<0.001
0–1 safety pad	49 (10–57)	64 (49–143)	<0.001
Potency, no. (%)	46 (65.7)	44 (62.9)	0.727

IQR = interquartile range; RS-RARP = Retzius-sparing robot-assisted radical prostatectomy; S-RARP = standard robot-assisted radical prostatectomy.
[a] With at least 12-mo follow-up: RS-RARP, *N* = 41; S-RARP, *N* = 70.

UCI Department of Urology

MP1-16: Early Postoperative Functional Outcomes Following Hood Technique Compared to Standard Nerve Sparing Approach

Narmina Khanmammadova[1], Mohammed Shahait[3], Tuan Thanh Nguyen[1,2], Rafael Gevorkyan[1], Jacob Basilius[1], Catherine Fung[1], Caroline Nguyen[1], **Sohrab Naushad Ali[1]**, David I. Lee[1]

[1]Department of Urology, University of California, Irvine, CA, USA, [2]Department of Urology, University of Medicine and Pharmacy Ho Chi Minh City, Vietnam, [3]Department of Surgery, Clemenceau Medical Center, Dubai, UAE

BACKGROUND

- Several modifications of the surgical technique applied during robot-assisted radical prostatectomy (RARP) were proposed to improve urine continence recovery rate.
- The Hood technique aims to preserve periurethral anatomical structures in preperitoneal space including endopelvic fascia, puboprostatic ligaments, anterior vessels, detrusor apron and some detrusor muscles.
- In this study, we compare early functional outcomes of the Hood technique and Standard Nerve Sparing (NS) technique.

METHODS

- 127 consecutive patients were identified who underwent RARP with the Hood technique and 130 consecutive patients with the Standard technique.
- The decision to proceed with the Hood technique was based on the surgeon's preference.
- Patient characteristics and functional outcomes at 3 months were compared between the two groups.
- Early continence was defined as using a 0-1 safety pad.
- The percentage of erection fullness is the patient-reported ability to have a full and hard erection.

RESULTS

- Patients undergoing RARP with the Hood technique had higher early continence rates and SHIM scores at 3 months (78% vs. 66%, p=0.041; 10 (3 – 20) vs. 5 (3 – 16), p=0.004, respectively).

RESULTS

Table 1. Preoperative patient characteristics

Variables	Standard Technique (n= 130)	Hood Technique (n= 127)	p value
Age (yr), mean ± SD	65 ± 8	66 ± 7	0.205
BMI (kg/m²), mean ± SD	28.5 ± 4.8	27.8 ± 4	0.237
Prostate volume (ml), median (IQR)	40 (32.9 – 58.3)	40.9 (28 – 60)	0.578
Preop AUASS, median (IQR)	8 (4 – 13)	8 (2 – 13)	0.261
Preop SHIM, median (IQR)	16 (10 – 22)	19.5 (14 – 24)	0.704
Preop PSA (ng/ml), median (IQR)	6.9 (5.3 – 11)	6.5 (5 – 10.3)	0.885
Biopsy Gleason Score, n (%): 3+3 3+4 & 4+3 4+4 4+5 & 5+4	 26 (20%) 72 (56%) 18 (14%) 12 (10%)	 21 (17%) 76 (60%) 19 (15%) 10 (8%)	0.417

Table 2. Functional Outcomes at 3 months

Variables	Standard Technique (n=130)	Hood Technique (n=127)	p value
Pads, n(%): 0-1 security pad 2 or more pads	 82 (66%) 42 (34%)	 89 (78%) 25 (22%)	**0.041**
AUASS, median (IQR)	7 (3 – 14)	6 (4 – 9)	0.898
SHIM, median (IQR)	5 (3 – 16)	10 (3 – 20)	**0.004**
% fullness of erection, median (IQR)	50 (15 – 80)	50 (20 – 80)	0.949
Patients with preop SHIM scores ≥18:			
SHIM, median (IQR)	8 (4 – 20)	18 (6 – 23)	**0.044**
% fullness of erection, median (IQR)	6 (3 – 8)	6 (3 – 8)	0.470

Table 3. Postoperative patient characteristics

Variables	Standard Technique (n= 130)	Hood Technique (n= 127)	p value
Postop PSA at 3 months, n (%): <0.2 >0.2	 91 (91%) 9 (9%)	 86 (84%) 17 (16%)	0.110
Surgical margins, n (%): Positive Negative	 16 (16%) 84 (84%)	 15 (12%) 111 (88%)	0.374
Clavien - Dindo complications, n (%): I II III	 2 (2%) 4 (3%) 2 (2%)	 4 (3%) 4 (3%) 3 (2%)	0.776

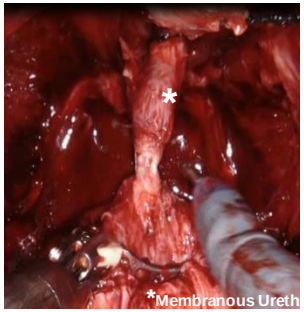

Fig 1. Apex: Standard NS technique

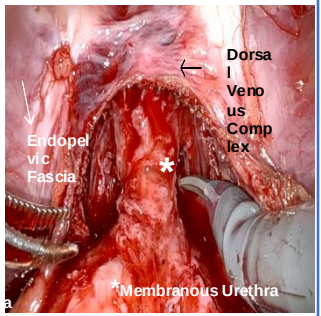

Fig 2. Appearance of the "Hood"

CONCLUSION

- The Hood technique improved the early continence rate without compromising perioperative or early oncological outcomes.

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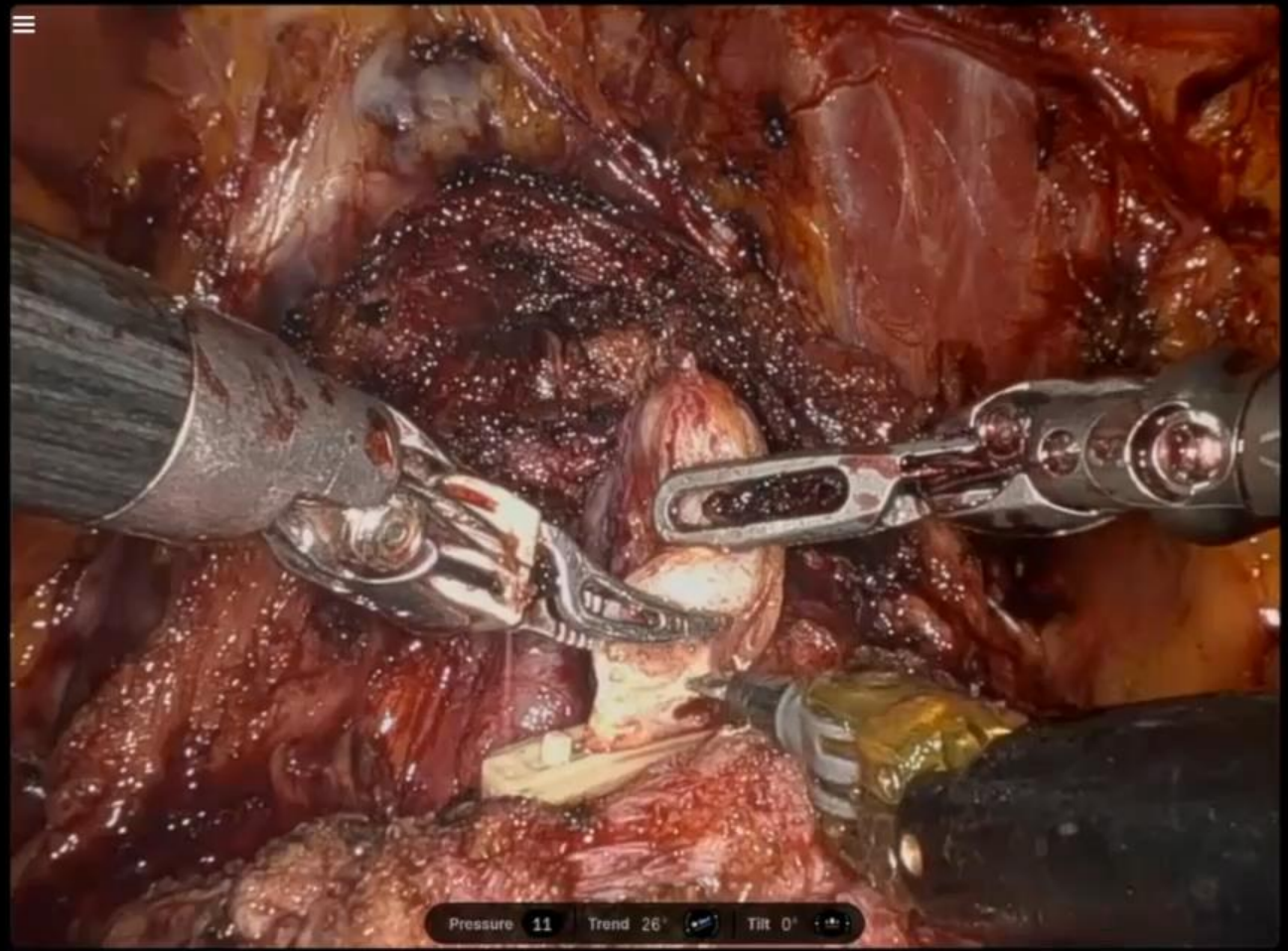


Instrument Paths

More videos

Viewing:

Prostatectomy - Radical w/ Lymphadenectomy / Transection

● You ▬ Your range ▬ Reference range

Duration

This case	Your average
141min 18s	112min 12s

Force

FFB Cadiere Forceps

This case max	This case average	Time above 6.5N
> 6.5N	2.3N	2%

FFB Lg Needle Driver

This case max	This case average	Time above 6.5N
> 6.5N	1.6N	1.1%

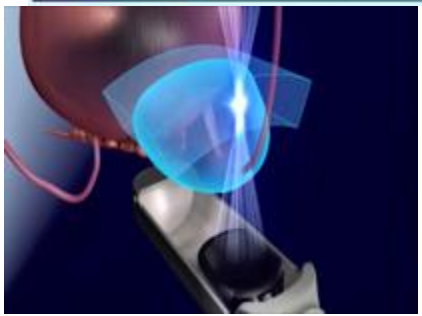
Endoscope clutch count

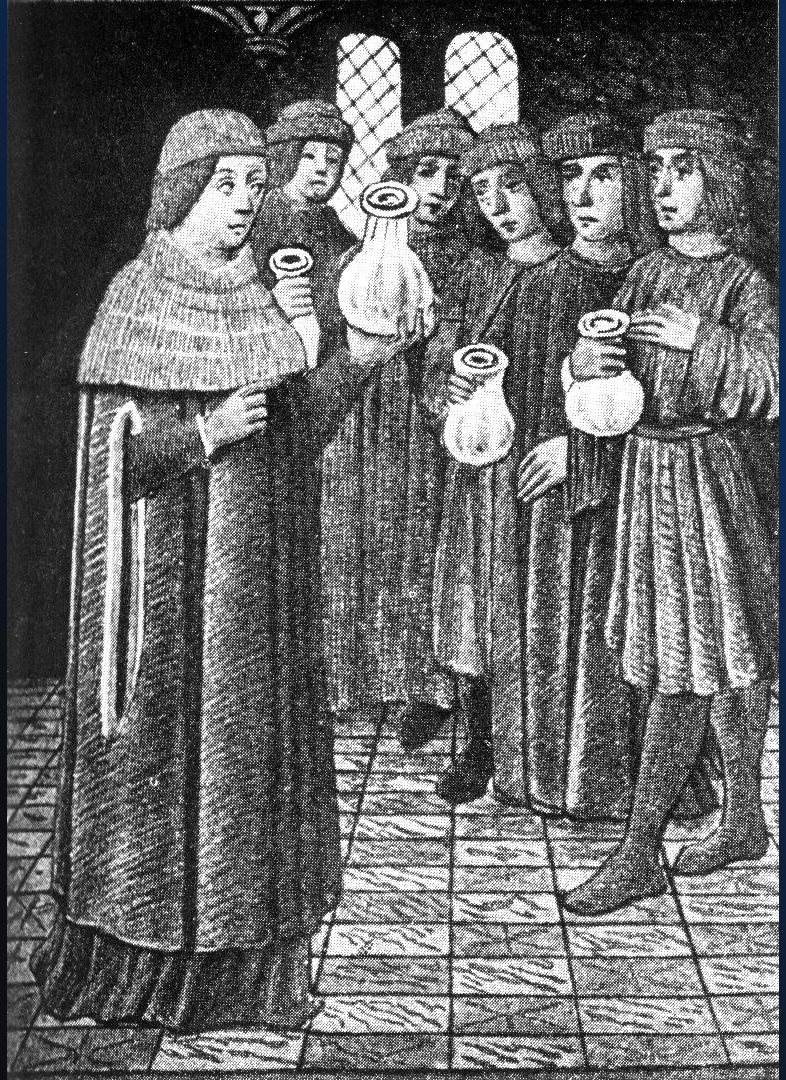
This case	Your average
488	707.1

SP Retroperitoneal partial nephrectomy

Focal Therapy

- Not mainstream yet
- Could be effective for men with low volume disease
- Cryo: freezing of prostate, outpatient
- HIFU: long track record in Europe, recently FDA approved in US
- Benefit: fewer side effects?
- Costs: bilateral disease? Recurrence mgmt?

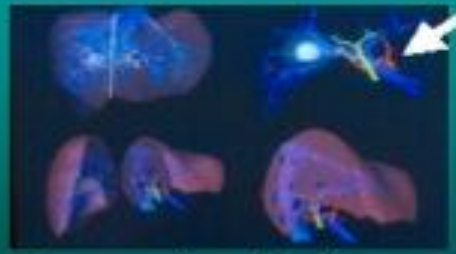




Total Integration of Surgical Care

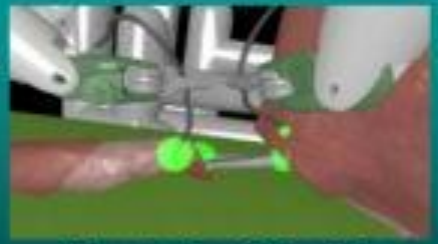
Remote Surgery

Minimally Invasive Surgery



Pre-operative planning

Intra-operative navigation



Simulation & Training

Joel Jensen,
SRI International, Menlo Park, CA

SURGERY:
IMPACT OF TECHNOLOGY

2010 - An Oslerian view:

"Diseases that harm require treatments that harm less."

Thank you

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