Role of Surgery in Cancer Prostate

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MAX

Some entirely unrelated history of medicine…

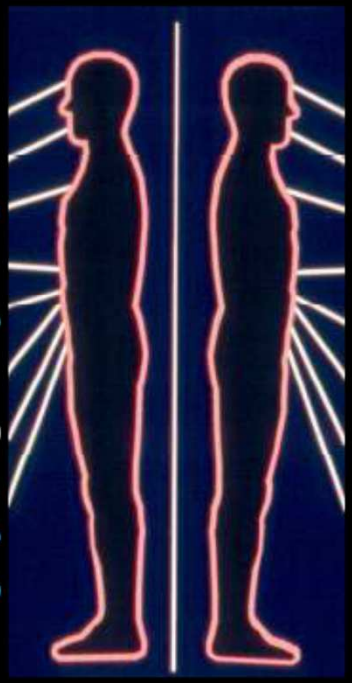
The roots are in urology…

Walker, Anthony., Physick, 1763

Panderen, Egbert van, 1581-1637

PROSTATE CANCER

Highest in Incidence and Second in Cause of Death from Cancer in American Males



Incidence		Cause of Death	
Melanoma of Skin	4%	4%	Esophagus
Oral Cavity & Pharynx	3%	31%	Lung & Bronchus
Lung & Bronchus	15%	6%	Pancreas
Pancreas	2%	3%	Kidney
Colon & Rectum	10%	4%	Liver
Kidney	4%	9%	Colon & Rectum
Prostate	**29%**	**9%**	**Prostate**
Urinary Bladder	7%	3%	Urinary Bladder
Leukemia	3%	4%	Leukemia
Non-Hodgkin's Lymphoma	4%	3%	Non-Hodgkin's Lymphoma
All Sites	766,860	289,550	All Sites
219,000 New Cases		27,000 Deaths	

2007 Estimates

Bangalore : 2.1 per 100,000 cases

Mumbai : 3.5

Delhi : 3.6

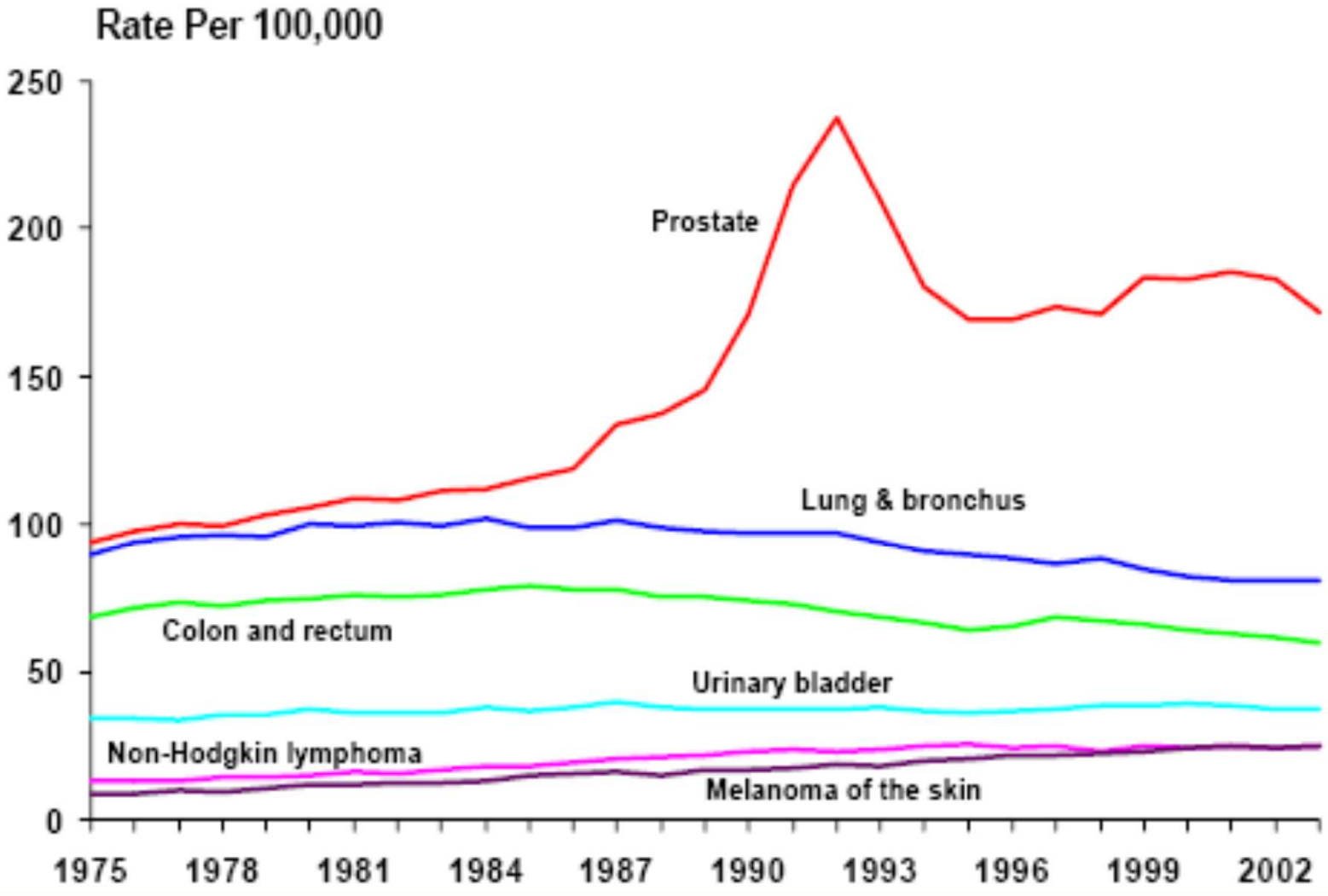
Chennai : 4.0

National cancer registry

Autopsy data

- 30% of men older than 50 years
- 70% of men older than 80 years
- Life time risk of developing clinically detected prostate cancer: 16%.

Cancer Incidence Rates* for Men, 1975-2003



National Cancer institute, 2006

PSA era

1960 – Albin et al, novel seminal protein

↓

1971 – Hara et al, protein unique to seminal fluid

↓

1979 – Wang et al, PSA

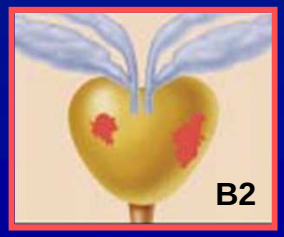
↓

1985 – post coital investigation of rape victim.

↓

1987 – Stamey et al, first clinical study on utility of PSA in prostate cancer.

Jewett Staging



TNM Staging

T1: Microscopic tumor confined to prostate and undetectable by a digital rectal exam (DRE) or ultrasound

T1a: found in 5% or less of prostate tissue sample

T1b: found in more than 5% of a prostate tissue sample

T1c: identified by needle biopsy as a follow-up to screening that detected elevated PSA results

T2: confined to prostate and can be detected by DRE or ultrasound

T2a: involves less than half of one lobe

T2b: involves more than half of one lobe

T2c: involves both lobes of the prostate

T3: Spread to surrounding tissues or to the seminal vesicles

T3a: Spread on only one side

T3b: Spread on both sides

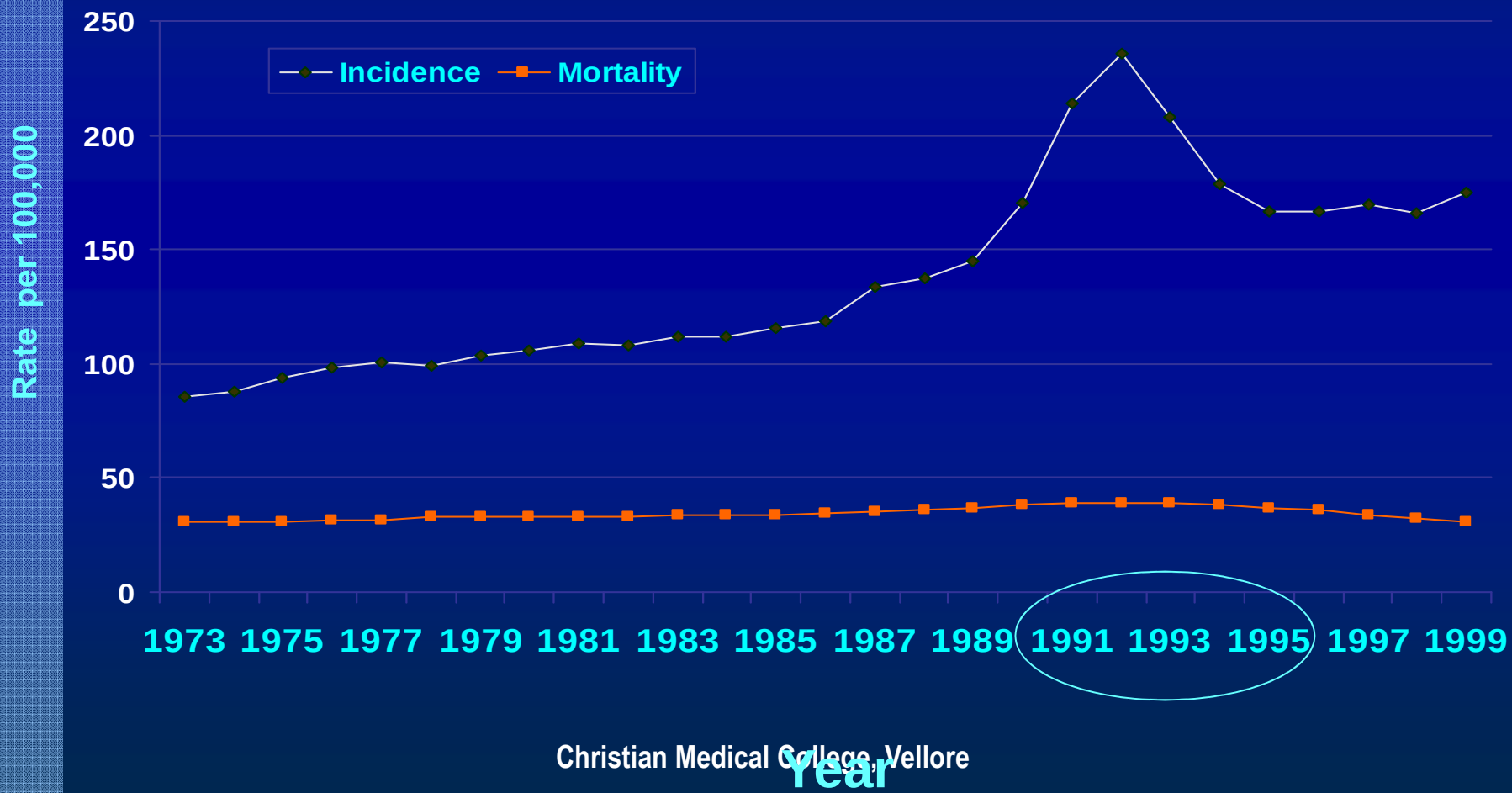
T3c: Spread to one or both of the seminal tubes

T4: Still within the pelvic region but may have spread to organs near the prostate

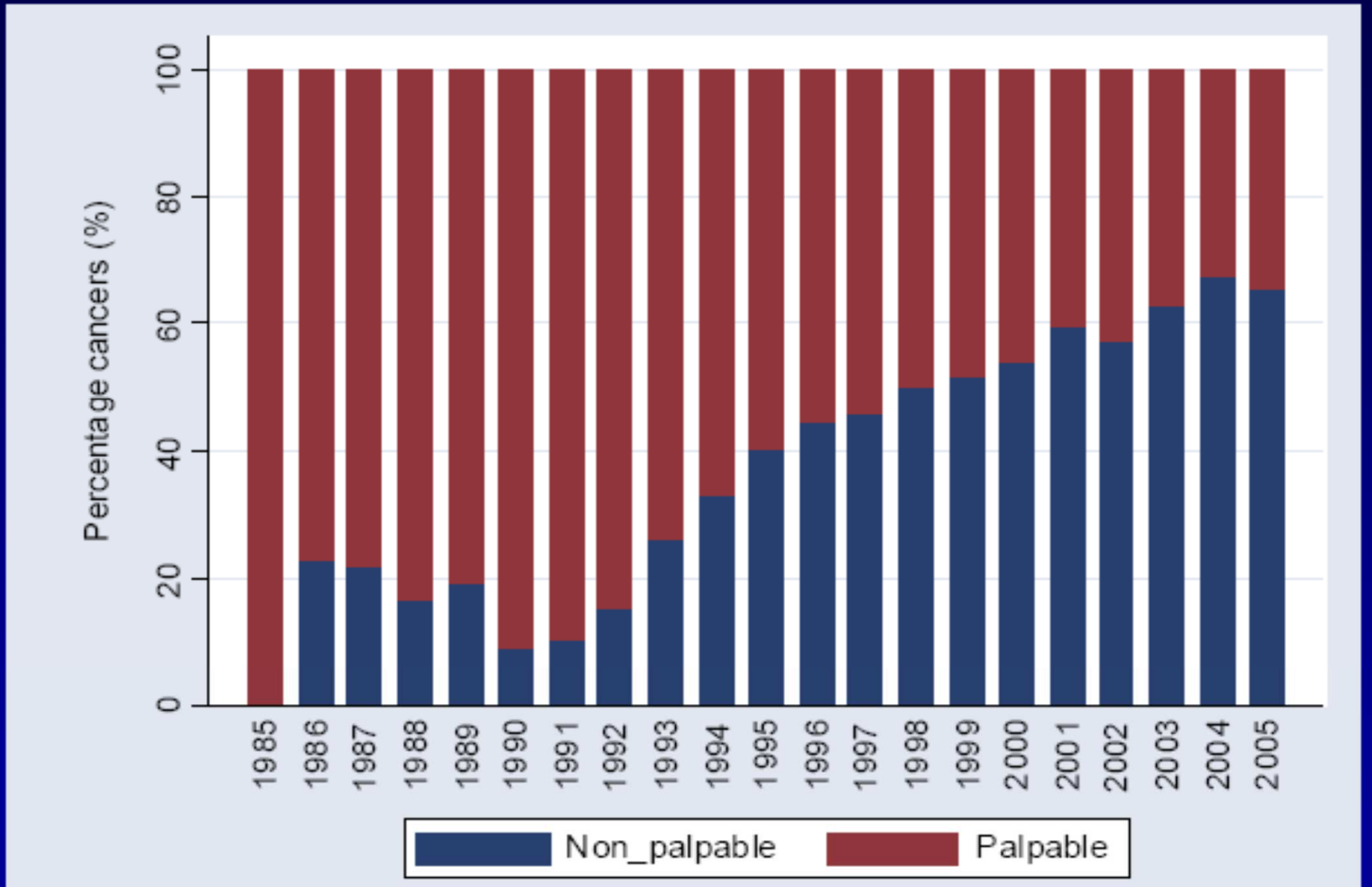
T4a: Spread to the bladder neck, the external sphincter, and/or the rectum

T4b: May affect the levator muscles / pelvic wall .

Prostate Cancer Trends
Influence of PSA Assay



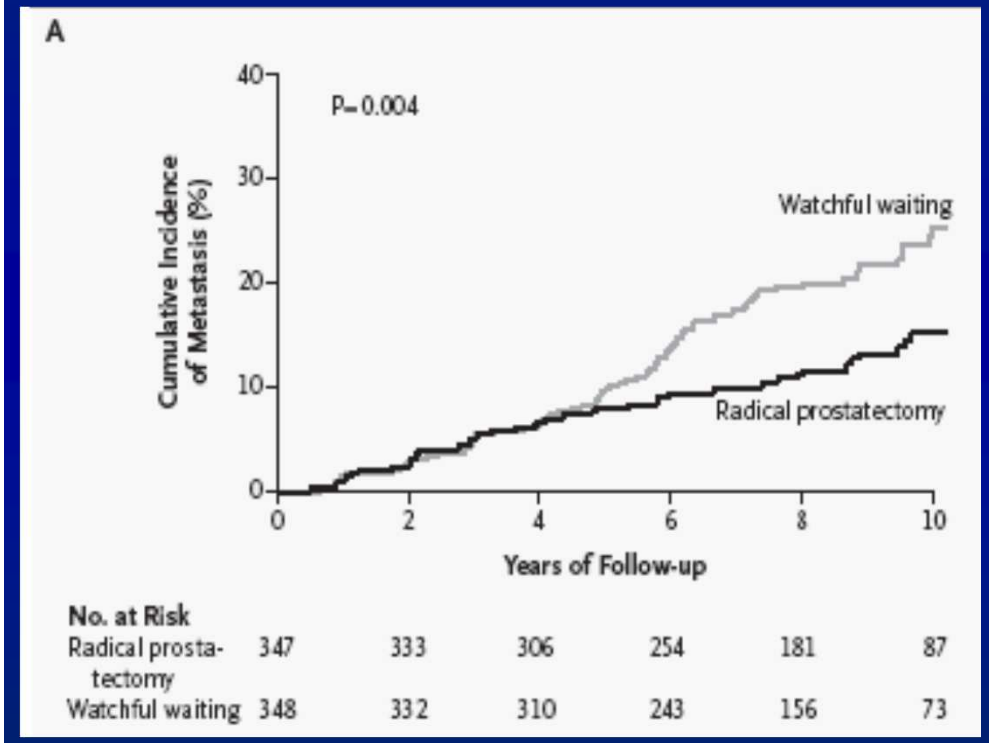
Incidence of T1c disease



Treatment options for prostate cancer

- Observation alone.
- Radical prostatectomy.
- Radiation therapy.
- Hormonal treatment.

Cumulative incidence of distant metastasis and of death from any cause



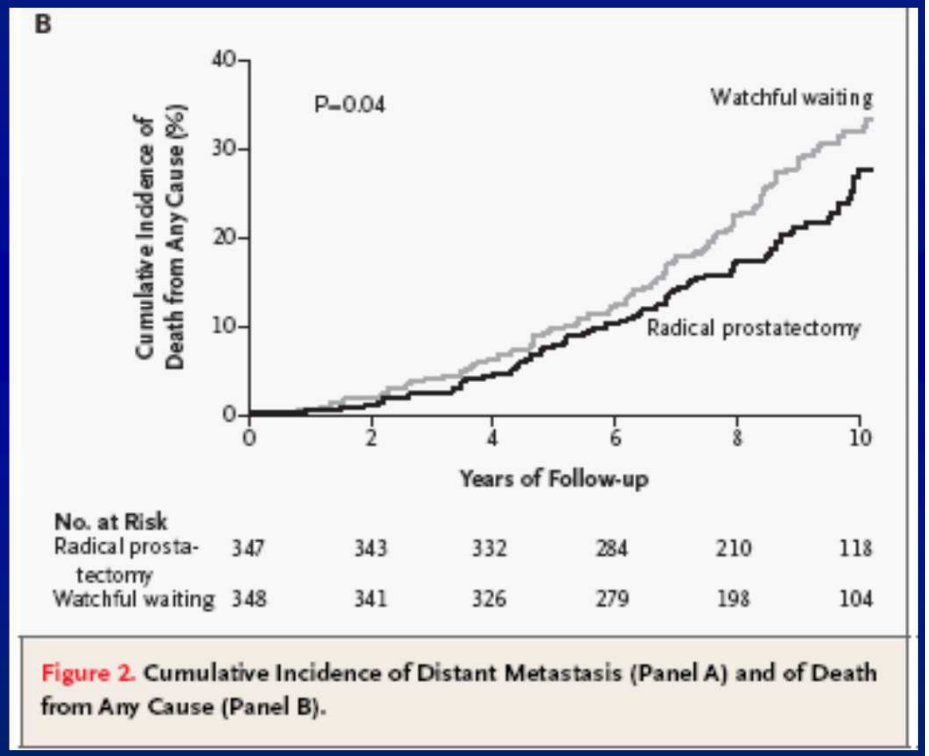
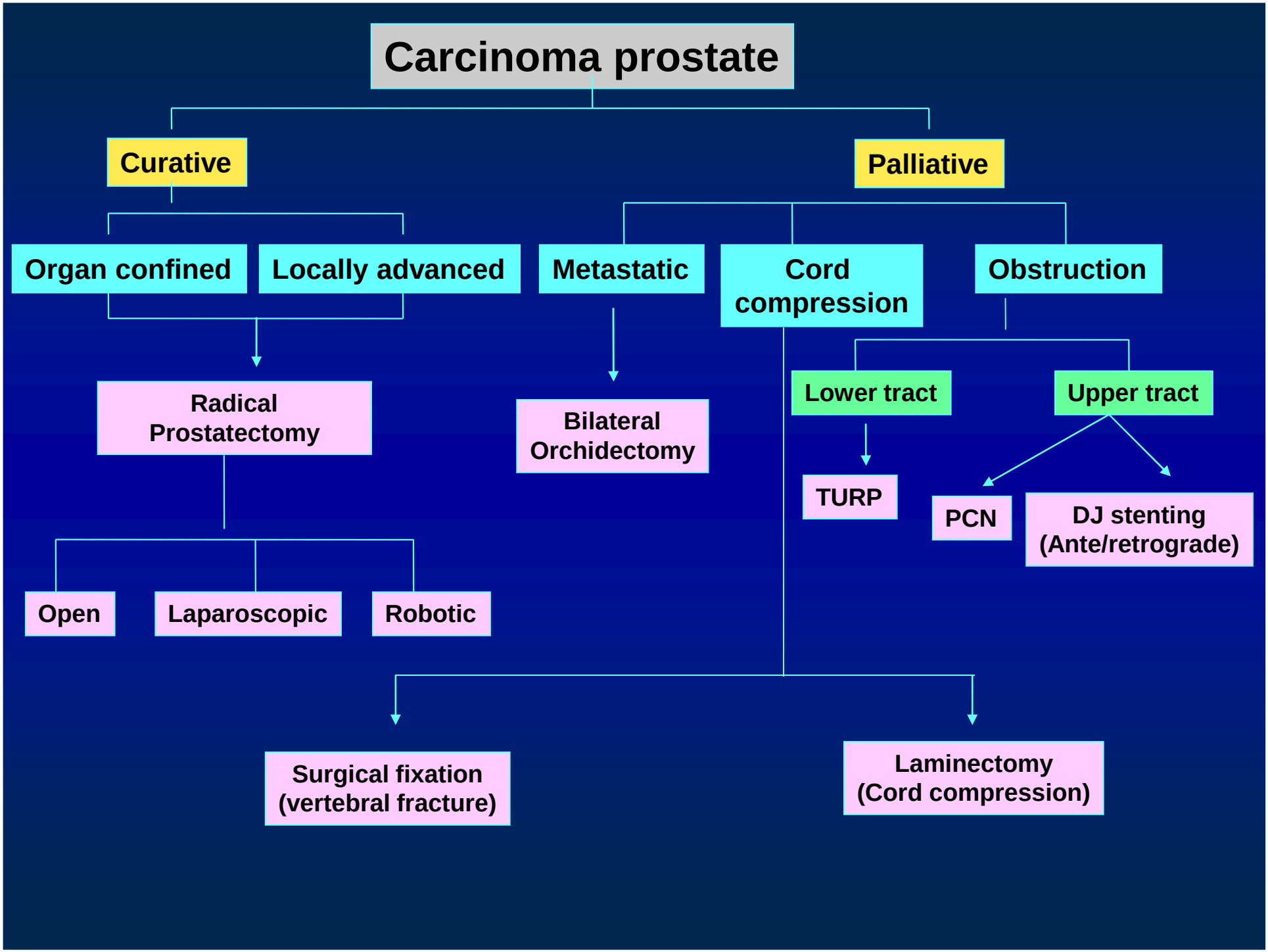


Figure 2. Cumulative Incidence of Distant Metastasis (Panel A) and of Death from Any Cause (Panel B).

NEJM, 2002


Carcinoma prostate
Curative
Palliative
Organ confined
Locally advanced
Metastatic
Cord compression
Obstruction
Radical Prostatectomy
Bilateral Orchidectomy
Lower tract
Upper tract
TURP
PCN
DJ stenting (Ante/retrograde)
Open
Laparoscopic
Robotic
Surgical fixation (vertebral fracture)
Laminectomy (Cord compression)

Localized Prostate cancer

- Confined to the prostate gland
- T1 or T2 lesion.
- Radical prostatectomy – gold standard?

Factors to be considered for surgical management

- Patient selection
- Risk stratification
- Pre-operative counseling
- Surgical options
- Post-operative complications

Radical prostatectomy
Patient selection

- Less than 60 yrs
- Good general health
- Life expectancy >10yrs
- No life threatening ancillary disease
- Removal of entire prostate and seminal vesicle
- Pelvic lymphadenectomy for staging
- Preservation of distal sphincter
- Preservation of cavernosal nerves - to prevent impotence
- Clinically localized T1, T2 & T3

Risk stratification for clinically localized prostate cancer

Low risk
Diagnostic PSA < 10.0 ng/mL *and*
Highest biopsy Gleason score < 6 *and*
Clinical stage T1c or T2a

Intermediate risk
Diagnostic PSA > 10 but < 20 ng/mL *or*
Highest biopsy Gleason score = 7 *or*
Clinical stage T2b

High risk
Diagnostic PSA > 20 ng/mL *or*
Highest biopsy Gleason score > 8 *or*
Clinical stage T2c/T3
PSA = prostate-specific antigen

D'Amico et al

Rationale for surgical treatment

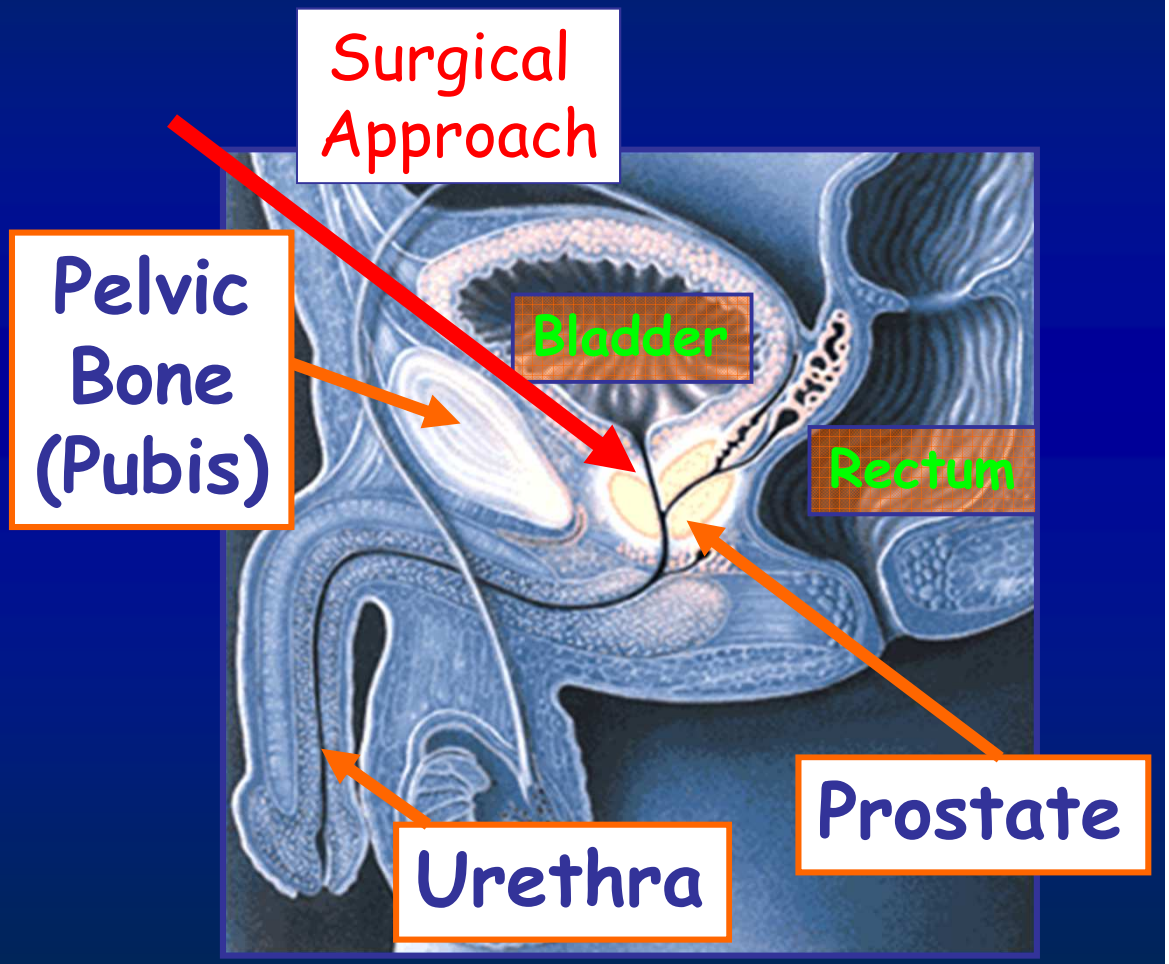
- Only 9-10% of cancers detected by PSA were indolent.
- 23% of T1c cancers and 40% of T2 tumours had advanced pathologic features
- High likelihood of cure for tumours detected early.

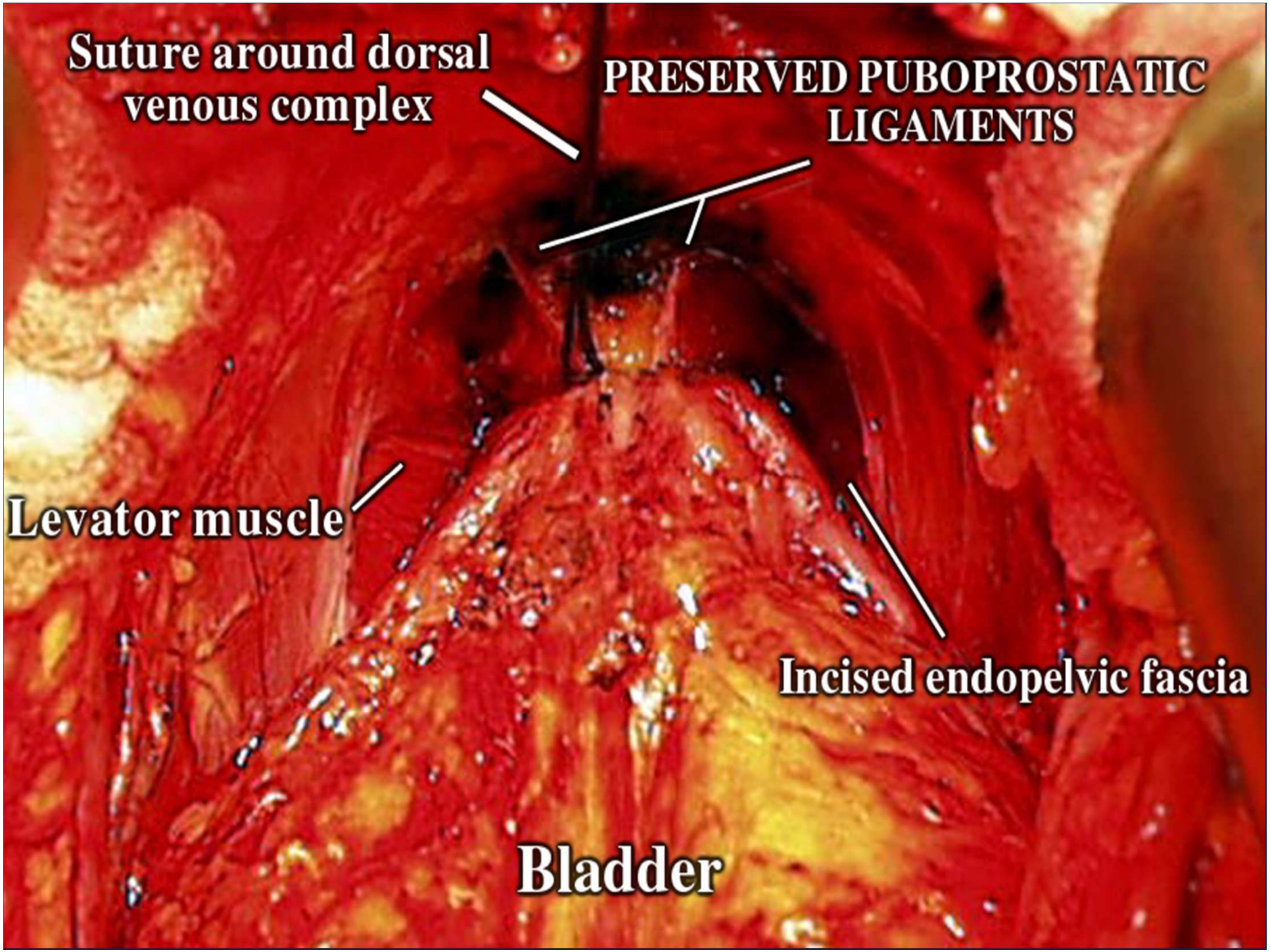
Surgical options

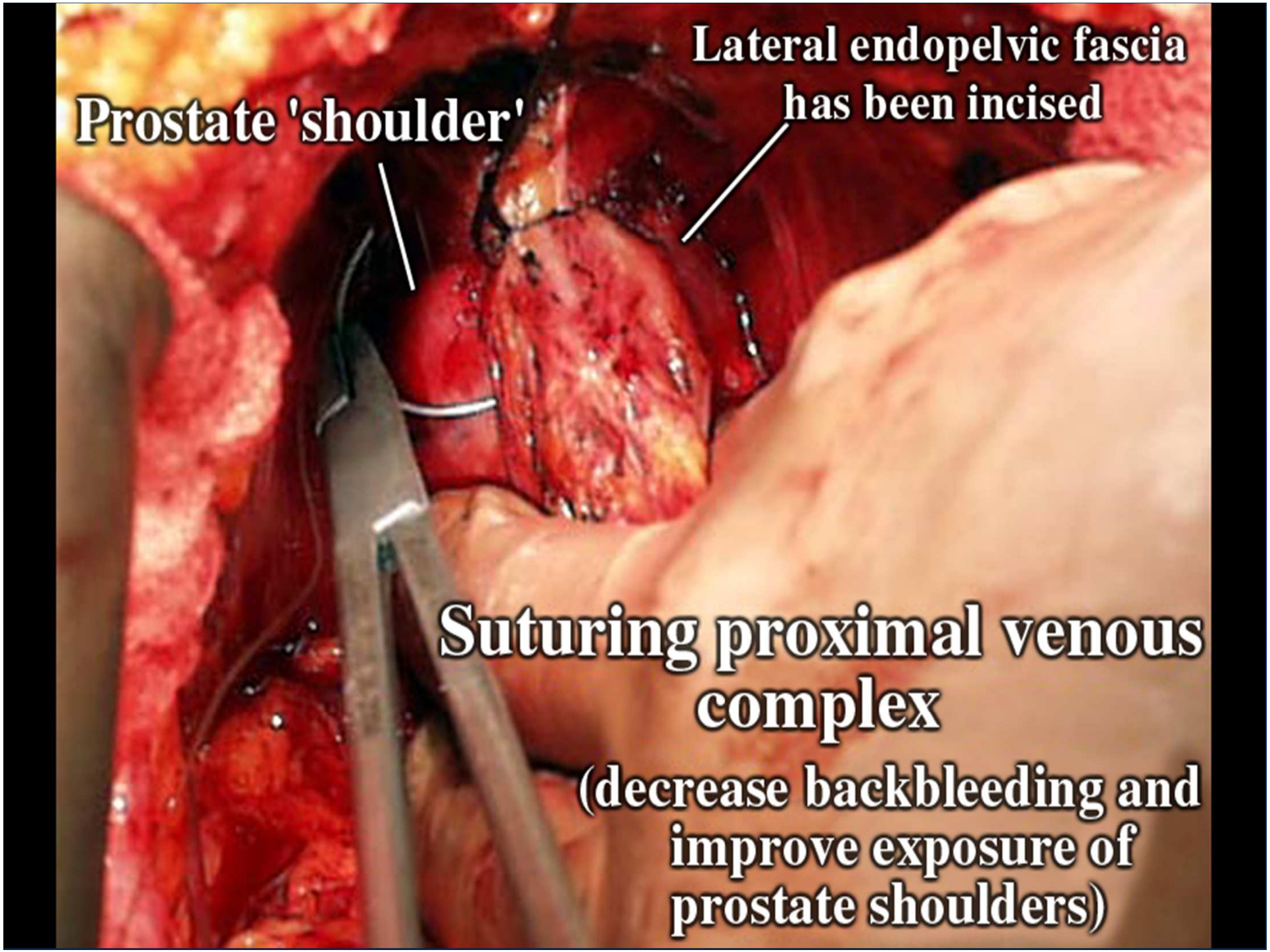
- Radical retropubic prostatectomy
- Radical perineal prostatectomy
- Laparoscopic radical prostatectomy
- Robotic prostatectomy

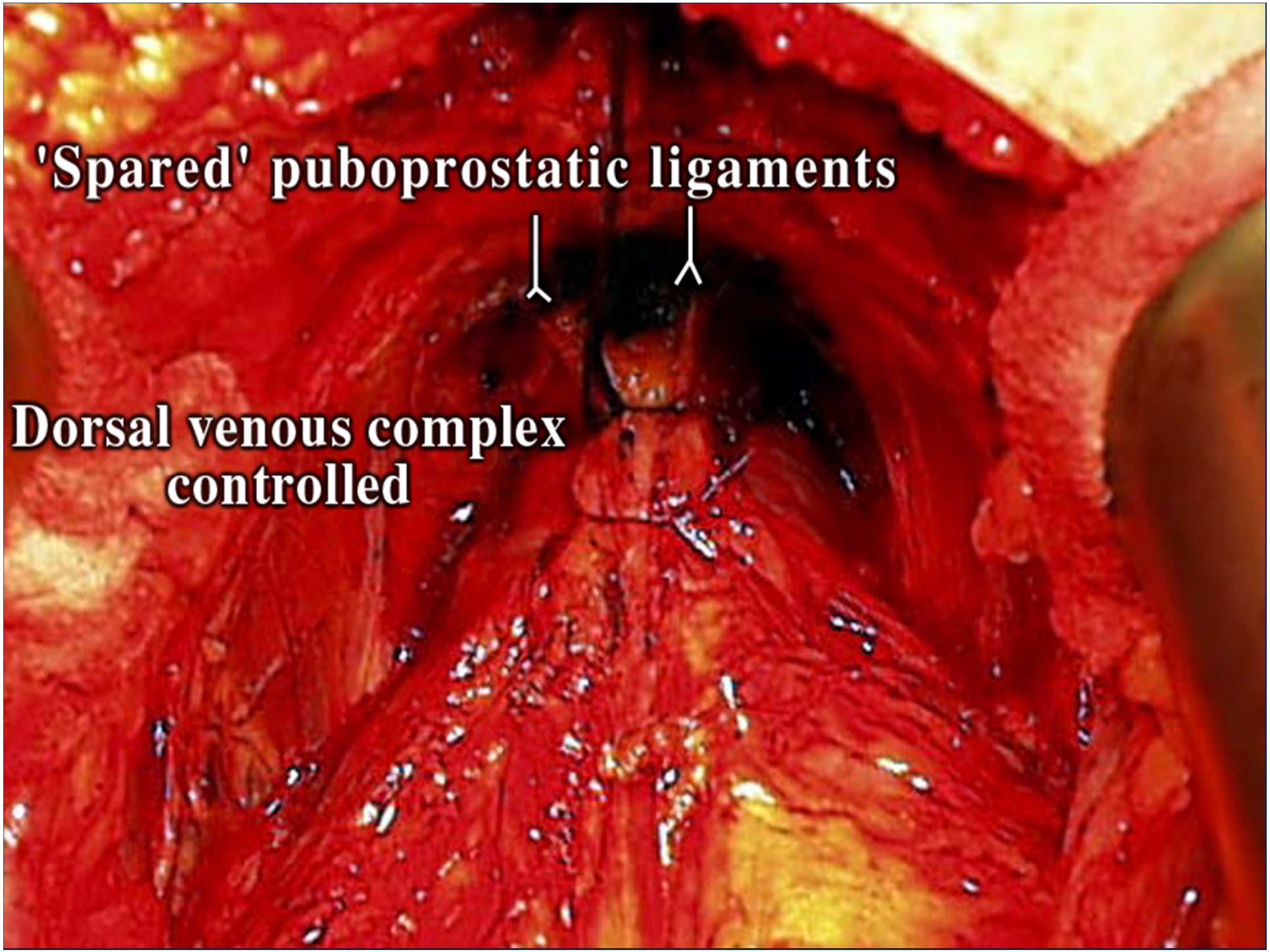
Open Surgical Approach

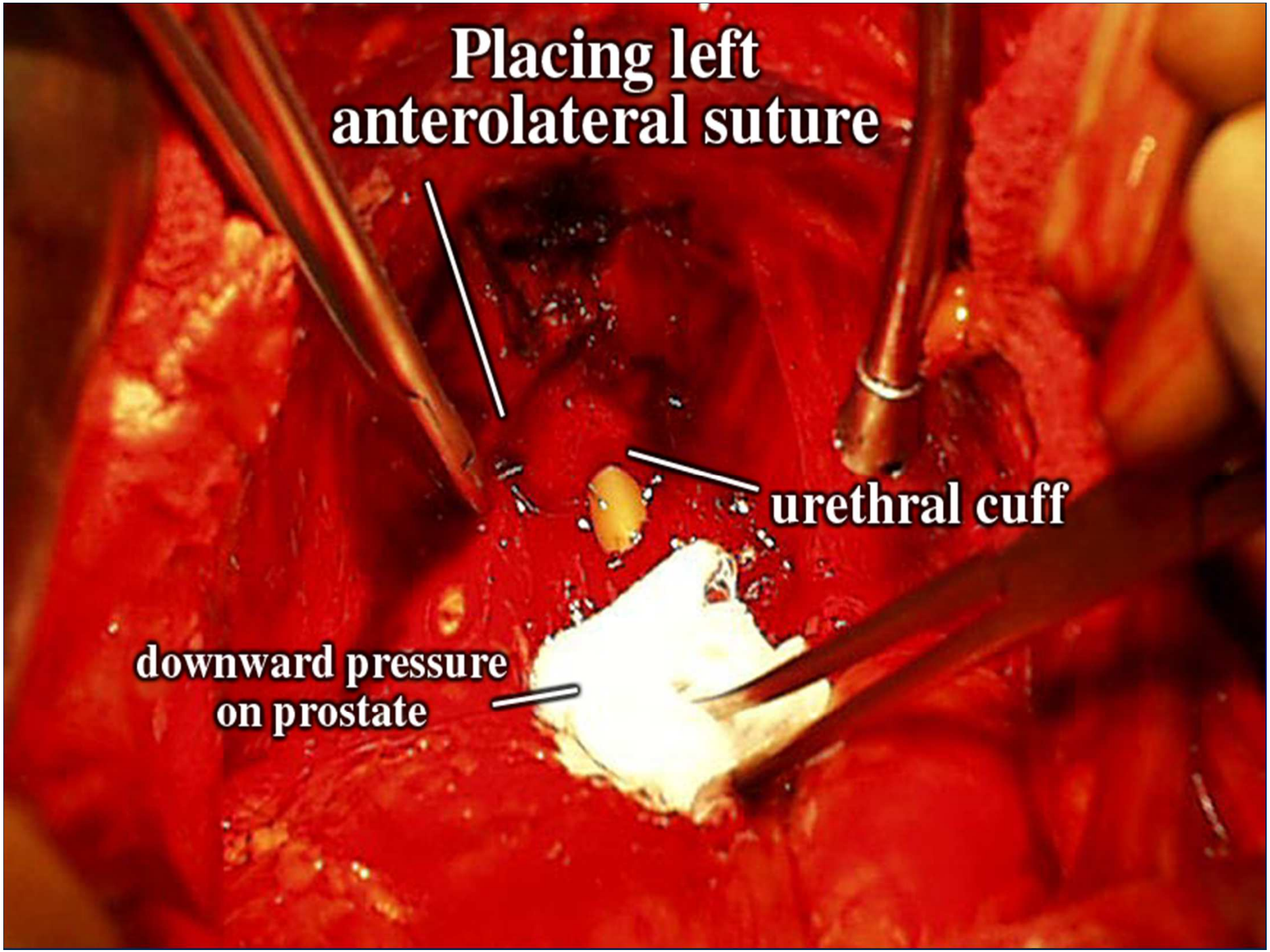
- 3-4 hours, general anesthesia.
- Incision: 8 cm Begins just below navel and extends to pubic bone.
- Remaining Urethra is sewn to bladder neck over a catheter.

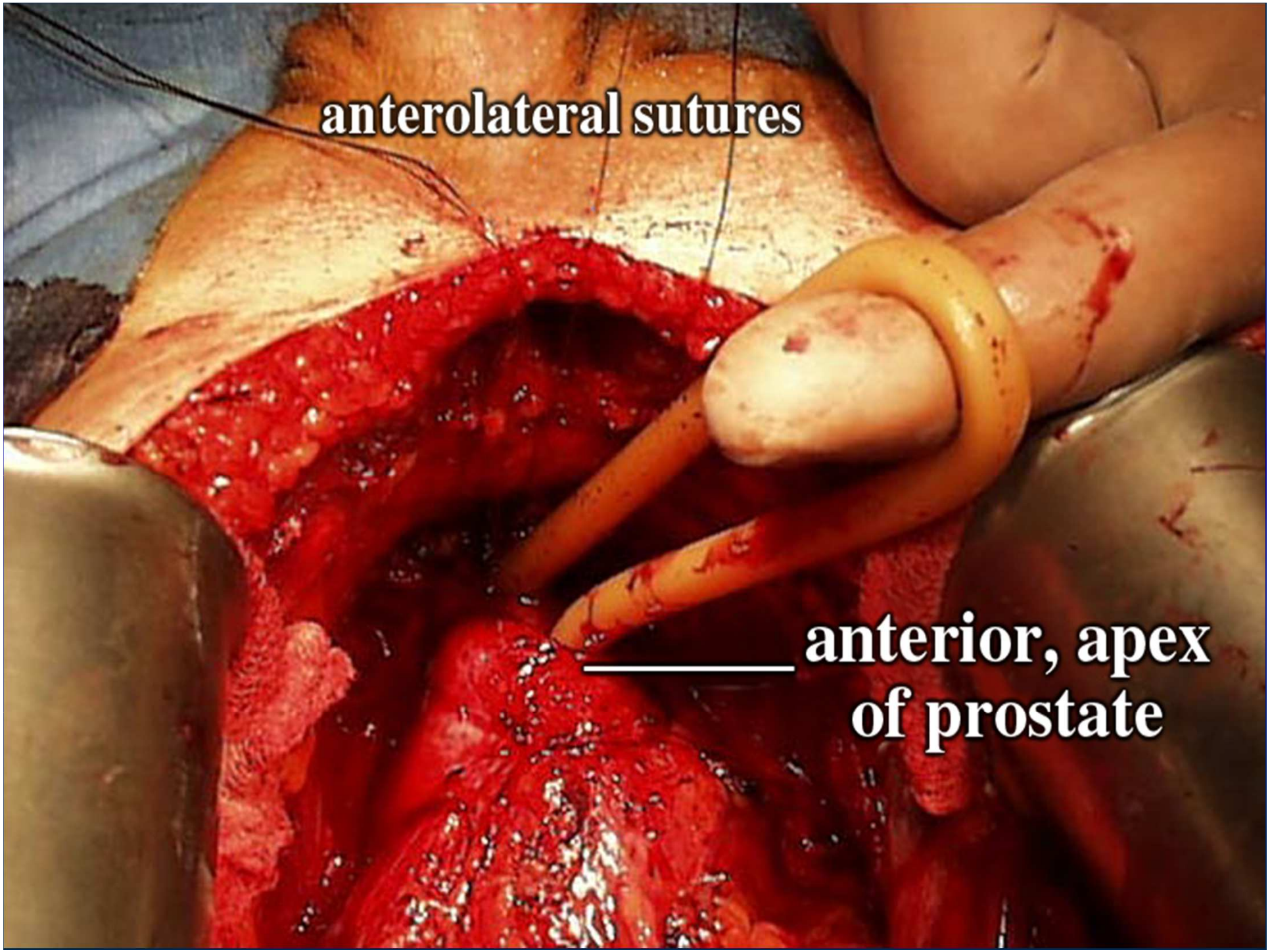


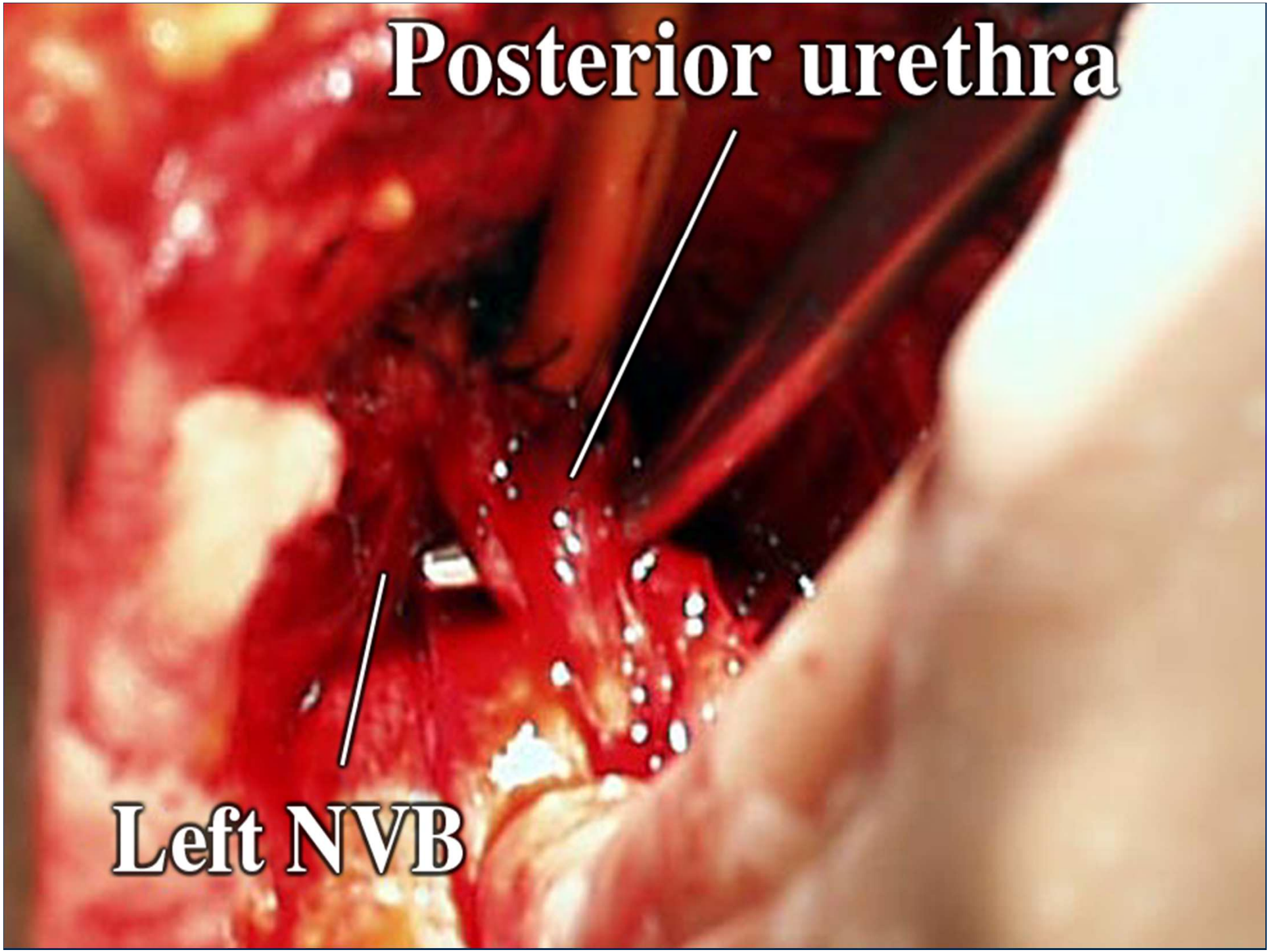

Suture around dorsal venous complex
PRESERVED PUBOPROSTATIC LIGAMENTS
Levator muscle
Incised endopelvic fascia
Bladder

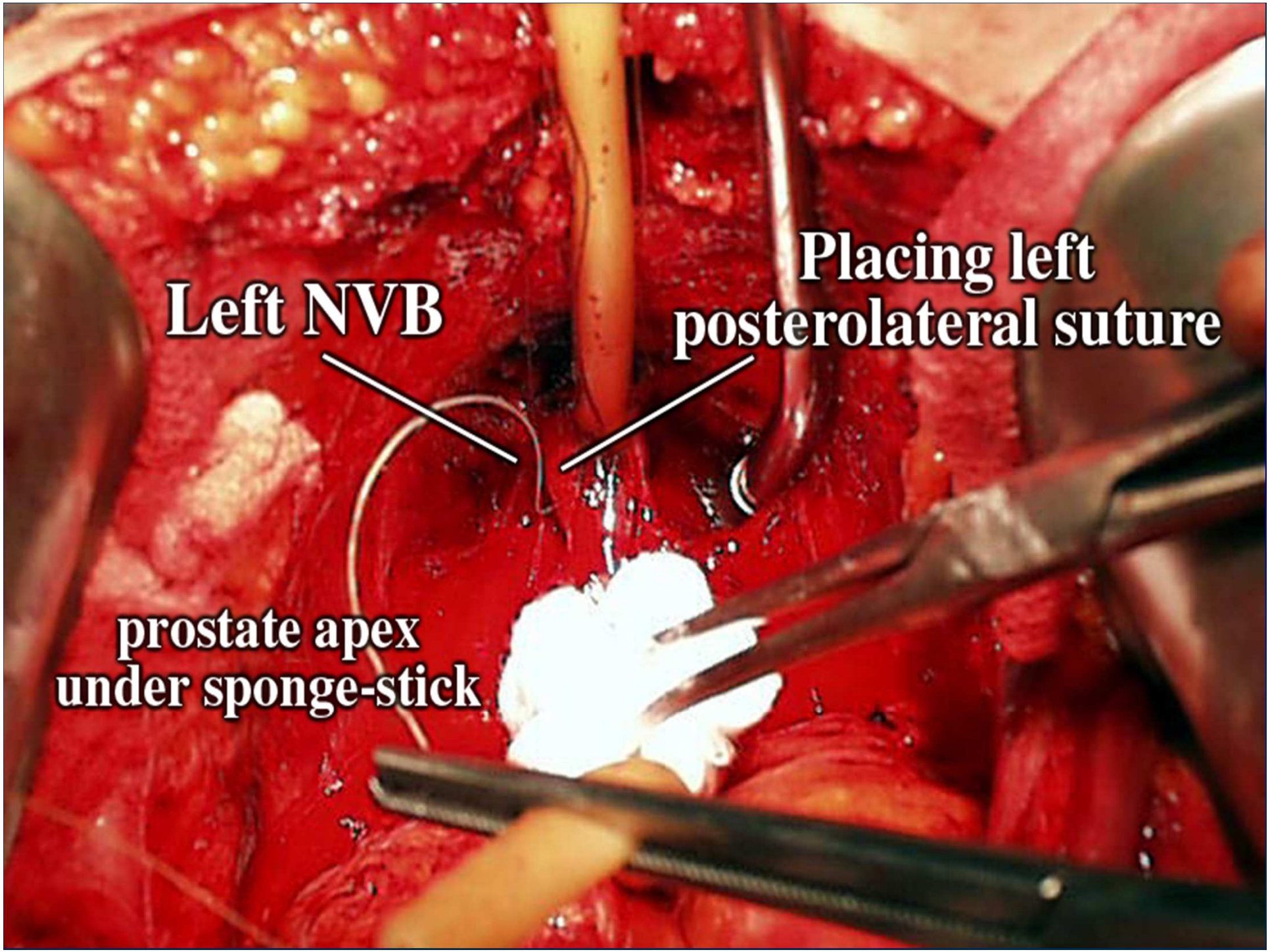

Prostate 'shoulder'
Lateral endopelvic fascia has been incised
Suturing proximal venous complex
(decrease backbleeding and improve exposure of prostate shoulders)

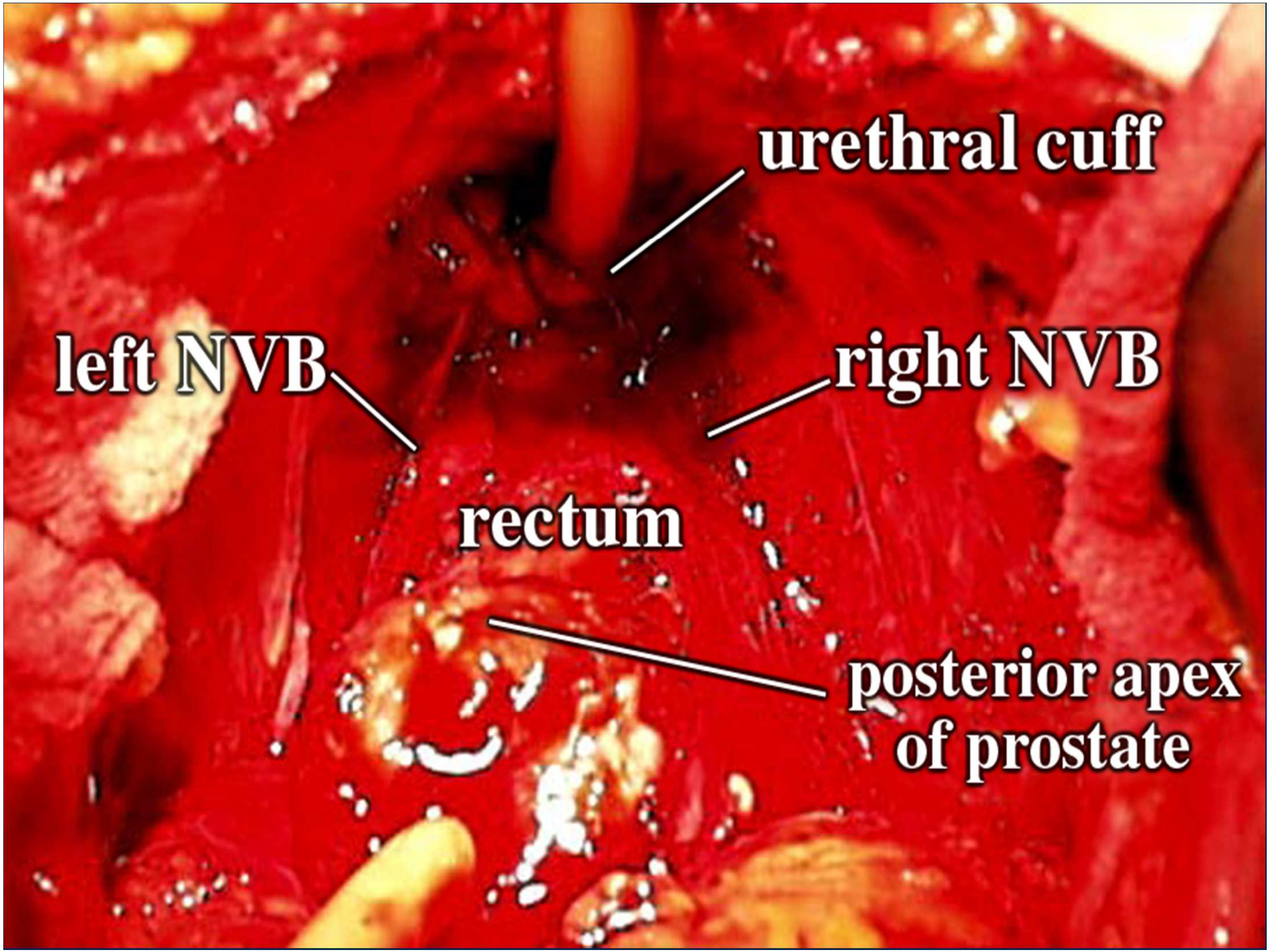

'Spared' puboprostatic ligaments
Dorsal venous complex
controlled

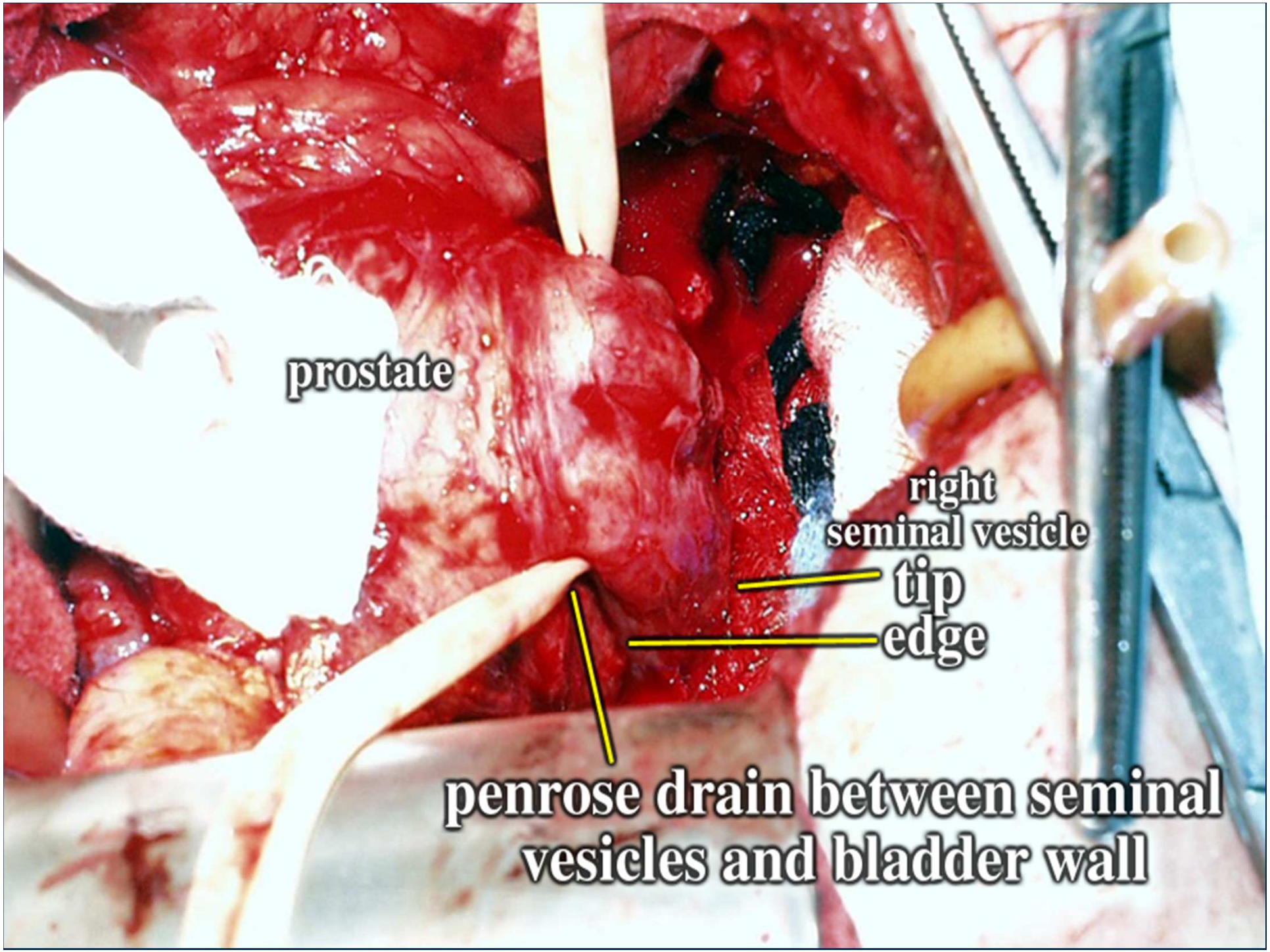

Placing left
anterolateral suture
urethral cuff
downward pressure
on prostate

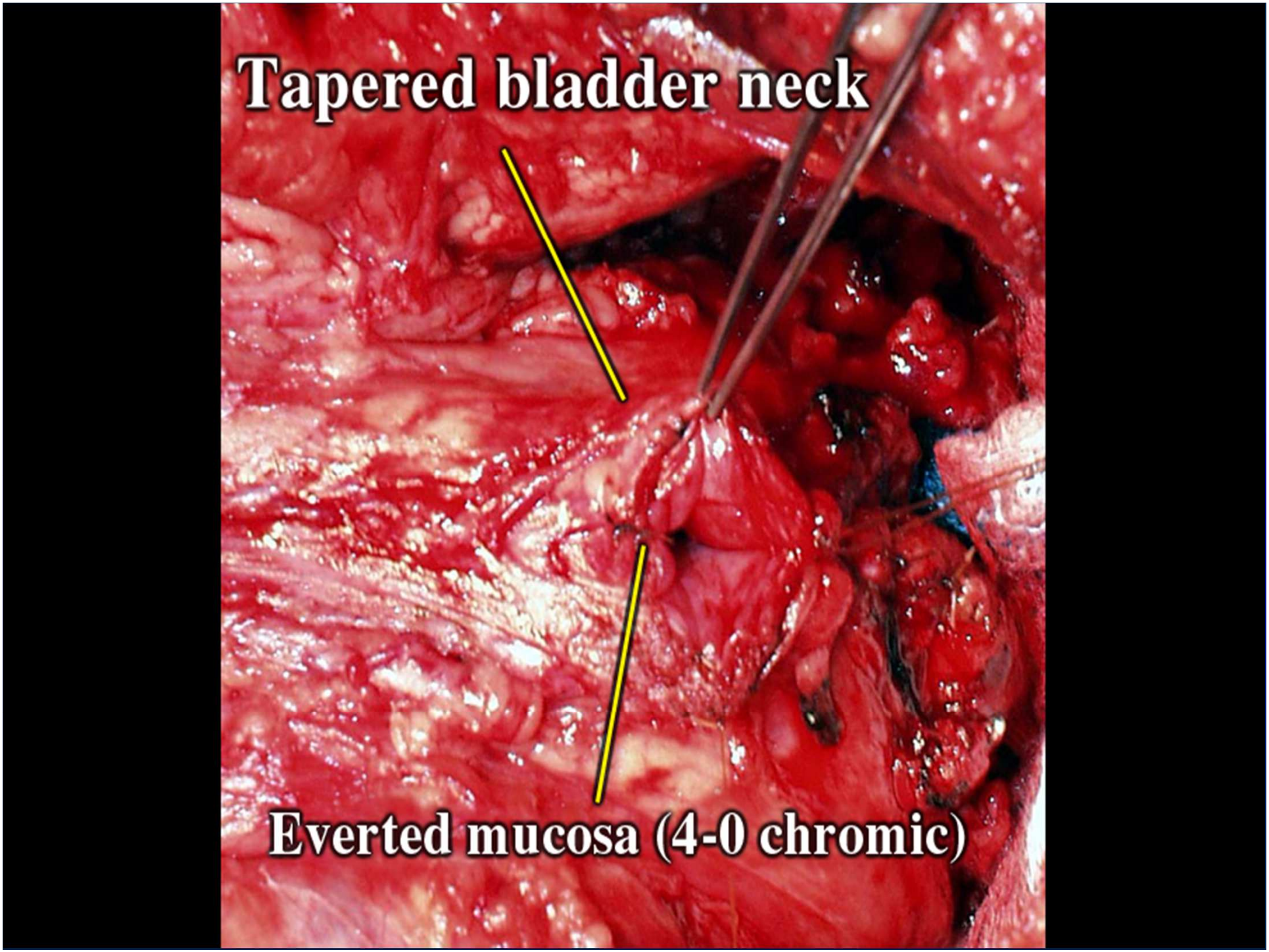

anterolateral sutures
_____ anterior, apex
of prostate

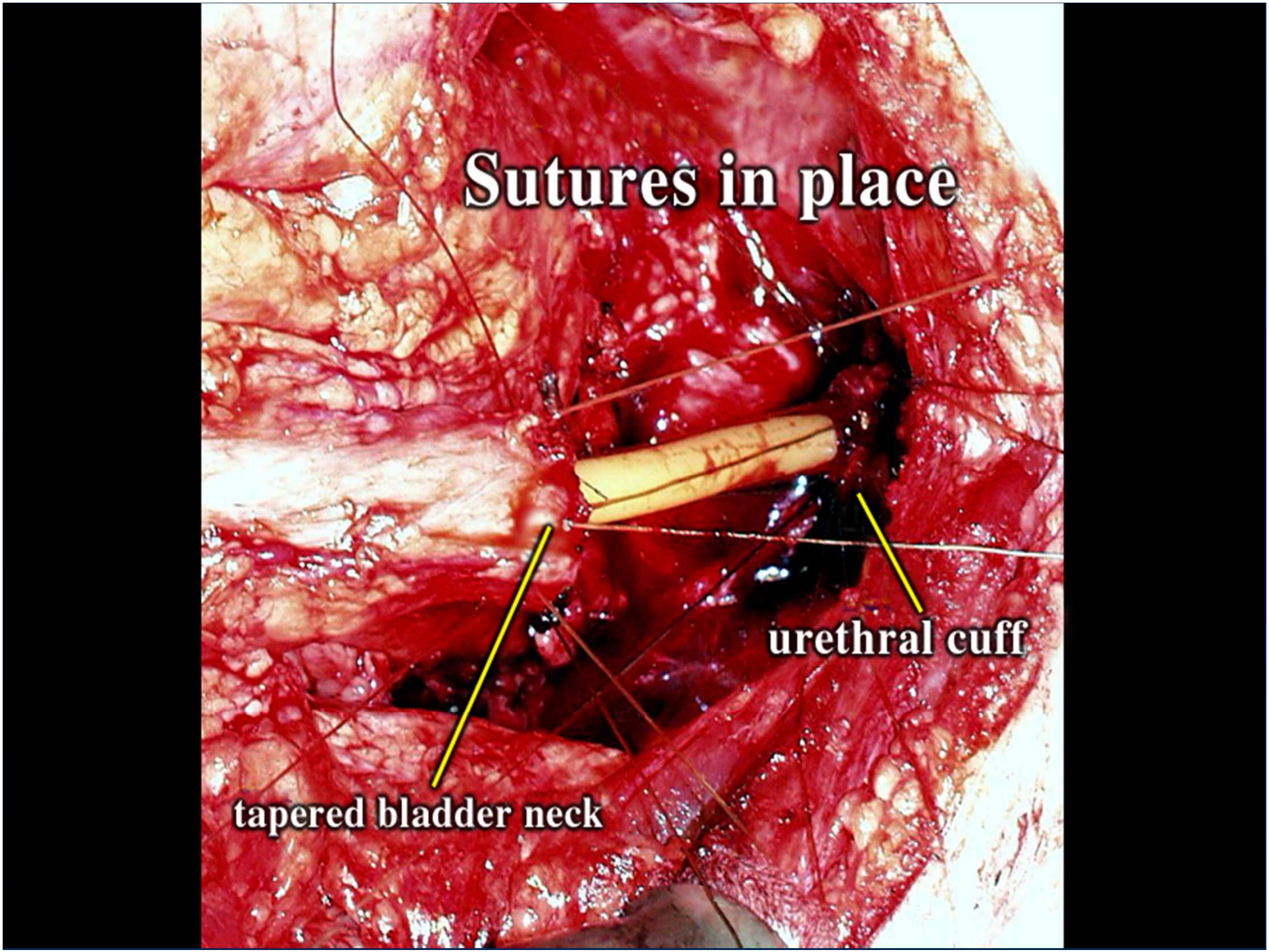

Posterior urethra
Left NVB

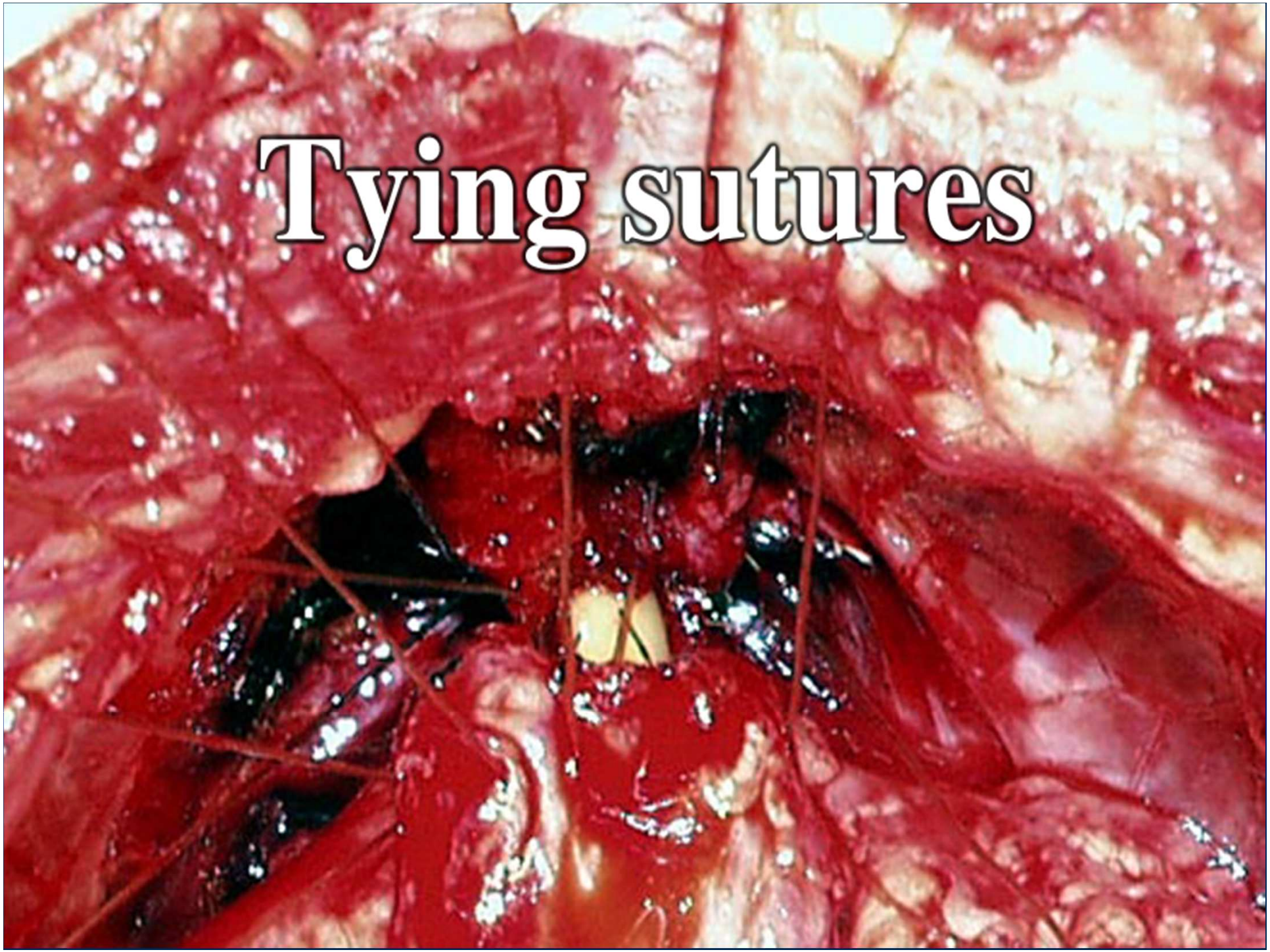

Left NVB
Placing left
posterolateral suture
prostate apex
under sponge-stick

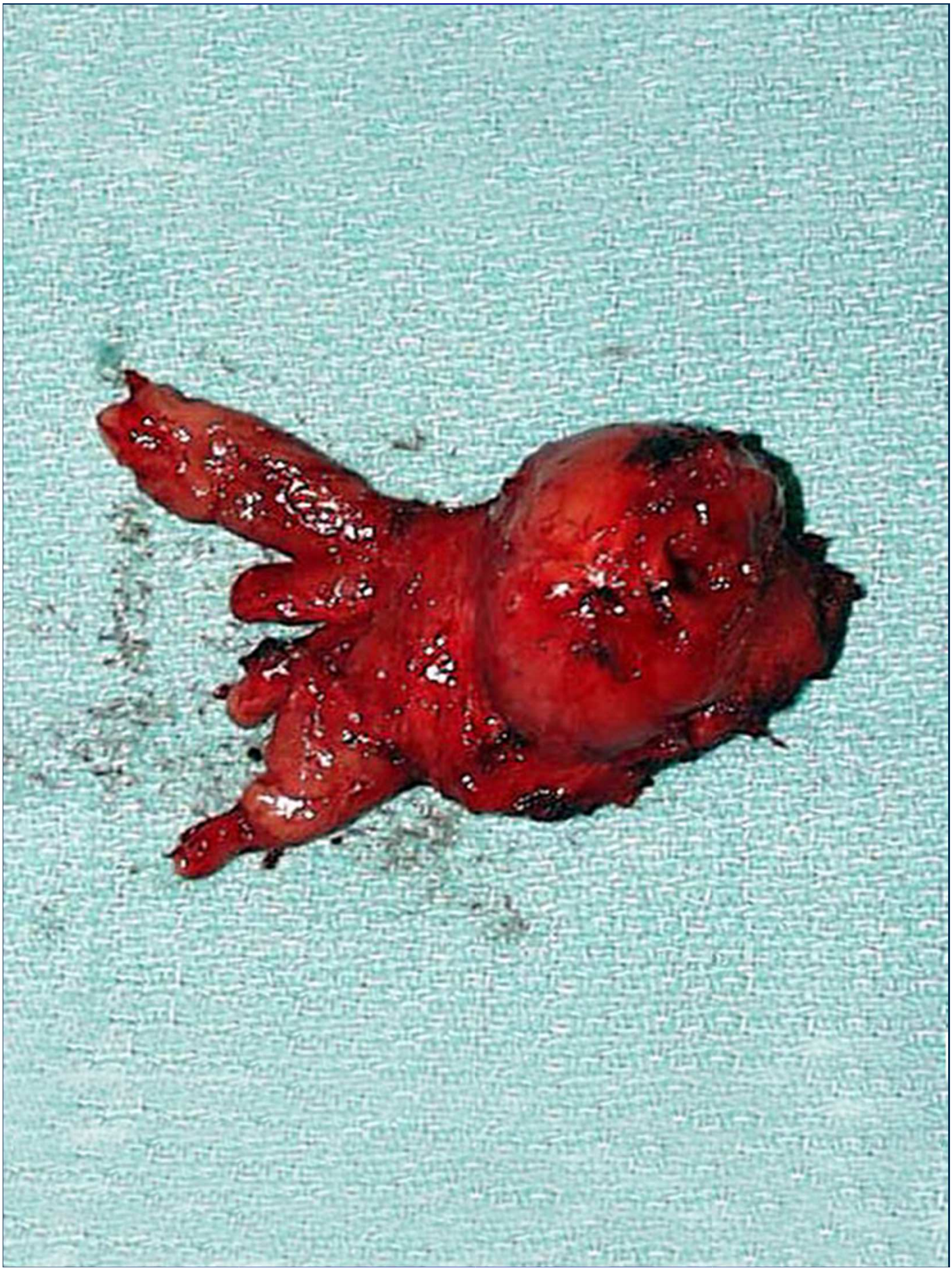

urethral cuff
left NVB
right NVB
rectum
posterior apex
of prostate


prostate
right
seminal vesicle
tip
edge
penrose drain between seminal
vesicles and bladder wall


Tapered bladder neck
Everted mucosa (4-0 chromic)


Sutures in place
urethral cuff
tapered bladder neck


Tying sutures



Complications

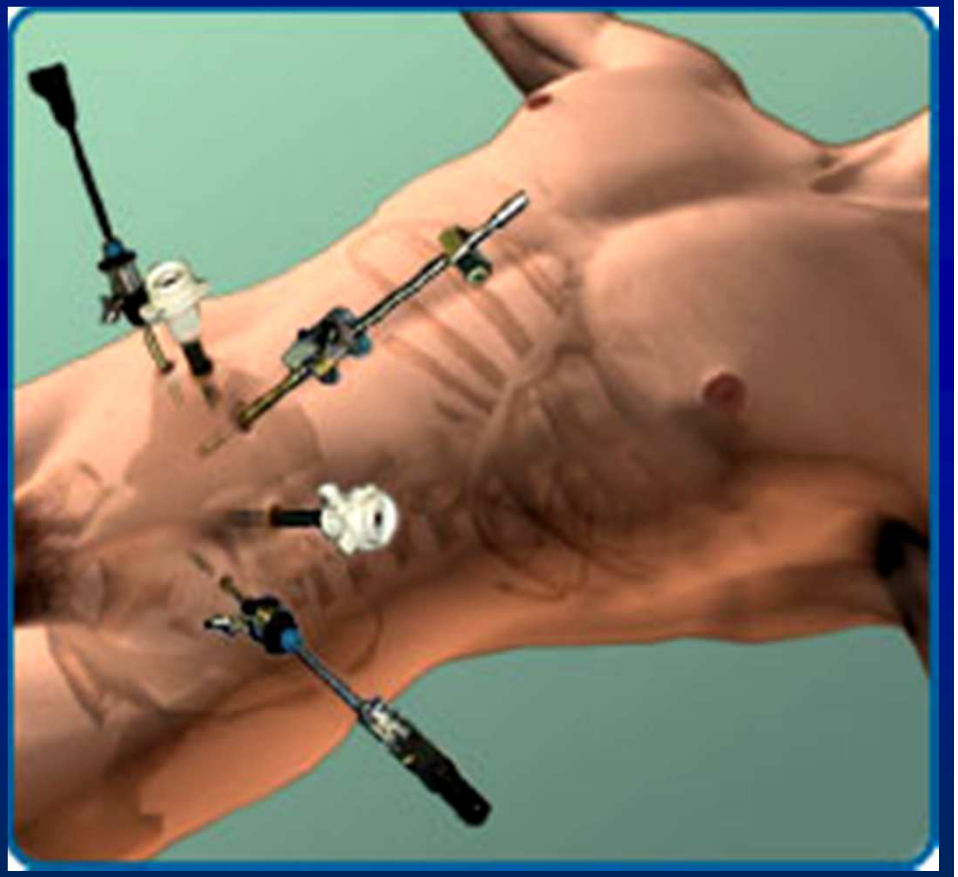
Bleeding

Incontinence

Erectile dysfunction

Laparoscopic Radical Prostatectomy

- Eliminates the need for a incision by using a telescopic instruments called a laparoscopes.
- Small camera attached to the laparoscope allows the surgeon to view inside the abdomen.
- More rapid recovery
- Unclear if any benefit for cancer cancer control, urinary or sexual function.



The Da Vinci system: Robotic Prostatectomy

- Surgeon operates from a console with a 3-D screen.
- Grasp controls to manipulate surgical tools within the patient.
- Robotic arms translate finger, hand, and wrist movements.
- Shortens learning curve of surgeons
- Very High-Precision
- Cost, Benefit unclear

Comparison of all three types of Radical prostatectomies

TABLE I. *Odds ratios (ORs) for key outcomes* *

Variables	Open Radical Prostatectomy (reference values)	Laparoscopic Radical Prostatectomy[19] (OR)	Robotic Prostatectomy[17] (OR)
Operating room times	163 min	1.51†	0.91‡
EBL	910 mL	0.42†	0.10†
Positive margins	23%	1	1
Complications	15%	0.67†	0.33†‡
Catheter time	15.8 days	0.50†	0.44†
Hospital stay >24 hr	100%	0.35†	0.07†‡
Postoperative pain score scale (0–10)	7	0.45†	0.45†
Median time to continence	160 days	1	0.28†‡
Median time to erection	440 days	NA	0.4†
Median time to intercourse	>700 days	NA	0.5†
Detectable PSA	15%	1	0.5

EBL = estimated blood loss; NA = not available, because most patients undergoing laparoscopic radical prostatectomy were not sexually active at baseline; PSA = prostate-specific antigen.

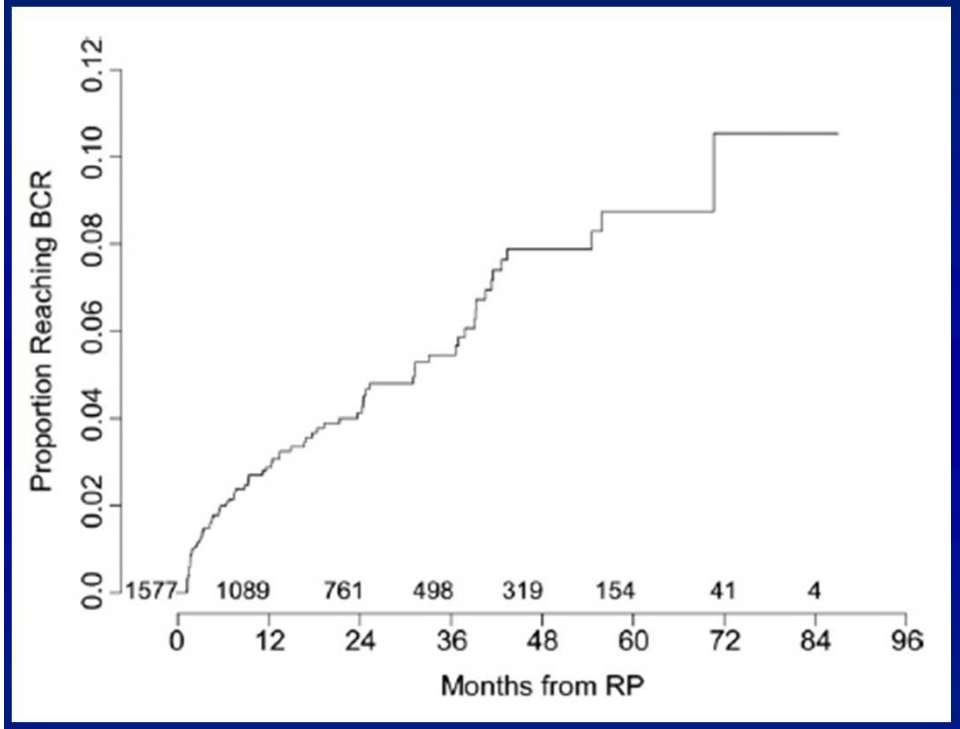
* *The reference values were those from conventional radical prostatectomy. OR was the ratio of the observed to the reference value.*

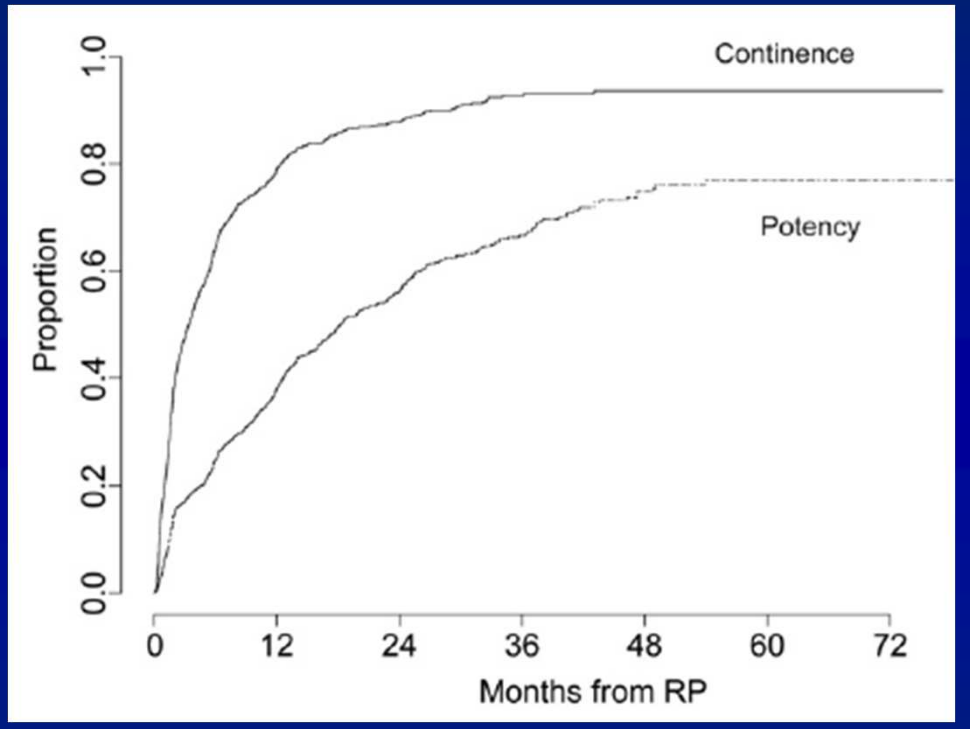
† $P < 0.05$ *vs robotic prostatectomy.*

‡ $P < 0.05$ *vs laparoscopic radical prostatectomy.*

Adapted from BJU Int[17] *and* J Urol.[19]

Trifecta nomogram





Probability of BCR (biochemical recurrence) with time

Probability of continence recovery after RP

Treatment metastatic disease

- Mainly palliative
- Eliminates symptoms in most symptomatic patients
- Prolongs time to clinical progression
- Prolongs survival

Results of Androgen Removal

Bilateral orchidectomy

- Gold standard
- Done under local anesthesia
- Rapid lowering of serum testosterone level
- Side effects less
- Cost effective
- Testicular prosthesis –cosmetic result

Side effects

- Impotence
- Loss of sexual desire (libido)
- Hot flashes
- Weight gain
- Fatigue
- Loss of muscle and bone mass

Locally advanced

- TURP
- PCN
- DJ STENT
- In conjunction with HRPC status

Bony metastases

Prophylactic surgical fixation - indications

1. lytic lesion
2. in a weight bearing bone
3. equal to or more than 50% of the C.S diameter.
4. >2.5 cms in length.
5. impending cord compression.
6. in the region that had received RT before.

Is cure necessary in those in whom it may be possible, and is cure possible in those in whom it is necessary?

Whitmore

Prostate Cancer

A pound of prevention,
ounce of cure


Thank You
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