Debate: Intra-operative planning is the gold standard of care in LDR brachytherapy

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Summary

- Inherent Difficulties and Aspirations
- Relative contraindications to brachytherapy

- Single Stage Dynamic Implants
- Guy's experience
- Early Outcome data – min 4 years

- Pushing the boundaries
  - Large Prostates / TUR Surgery

Brachytherapy @ Guy's Proposed Selection Criteria 2002

- **Disease Selection Criteria**
  - PSA < 15
  - Gleason Score < 7 (3+4)
  - T2a disease or less
- **Patient Selection**
  - Minimal urinary symptoms
  - Smallish prostate (<45 cc)
  - Max Flow >15ml/sec
  - Minimal residual urine
- **Relative Contraindications**
  - Severe lower urinary tract symptoms (IPSS > 12)
  - **Large prostate > 50 cc**
  - **Previous Prostate Surgery (TURP)**
- **Absolute Contraindications**
  - Previous pelvic radiation
  - Urinary retention
  - Locally advanced disease

Familiarisation Programme

July – October 2003

- UK Experience
  - Guildford
  - Cookridge Leeds
- Memorial Sloane Kettering Cancer Center
  - Louis Potters (Long Island)
  - Michael Zelefsky (New York)
- Mount Sinai Medical Center (New York)
  - Richard Stock & Nelson Stone
- Institute Curie Paris
  - Prof Cosset

Dynamic Prostate Brachytherapy

"The Guy's Experience"

- 350 Dynamic Implants Dec 2003 – April 2010
- **Median 39 cc (15-91cc) 70 pts > 50 cc**
- Iodine 125
- R_x dose 145 Gy Monotherapy, 110 Gy as boost to EBRT

- **2 Cases per list**
- No pre-implant pubic arch studies
- Pubic arch interference overcome intra-operatively
- No hormonal manipulation
- All patients discharged within 24 hrs, 95% Day Cases

"The Learning Curve"

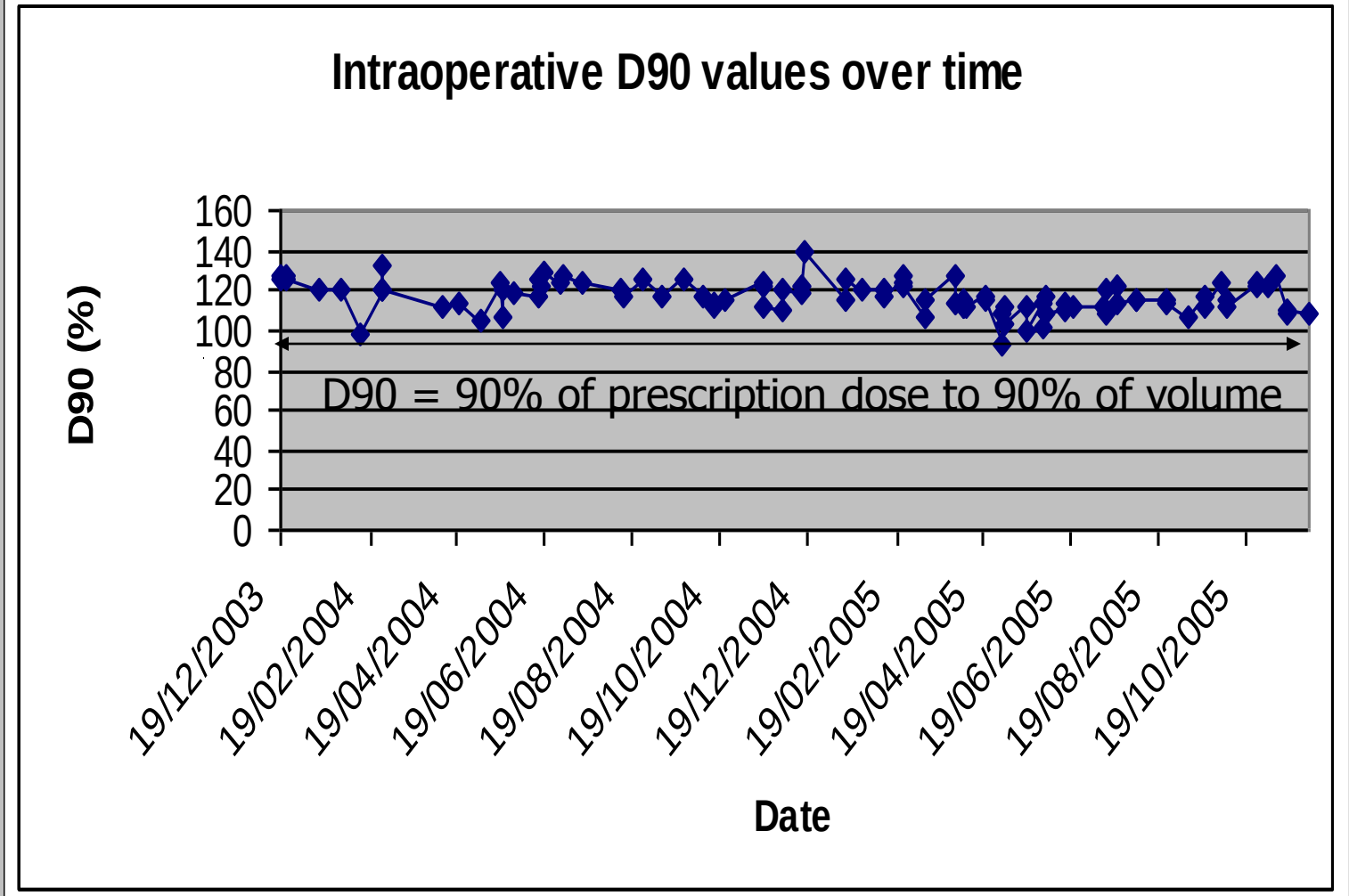
- Door-to-door Op time
- Cases 1 – 10 Median 138 mins
- Cases 67 – 77 Median 97.5 mins
- Cases 77 – 115 Median 82 mins

- Catheterless procedure since July 2005 (BWO at end)
- Cystoscopy only for previous TUR patients
- Same day discharge
- Satisfactory implant quality from the outset

Acher et al. Int J Radiat Oncol Biol Phys 2006

"Implant Quality"

Variation of D90 with Time

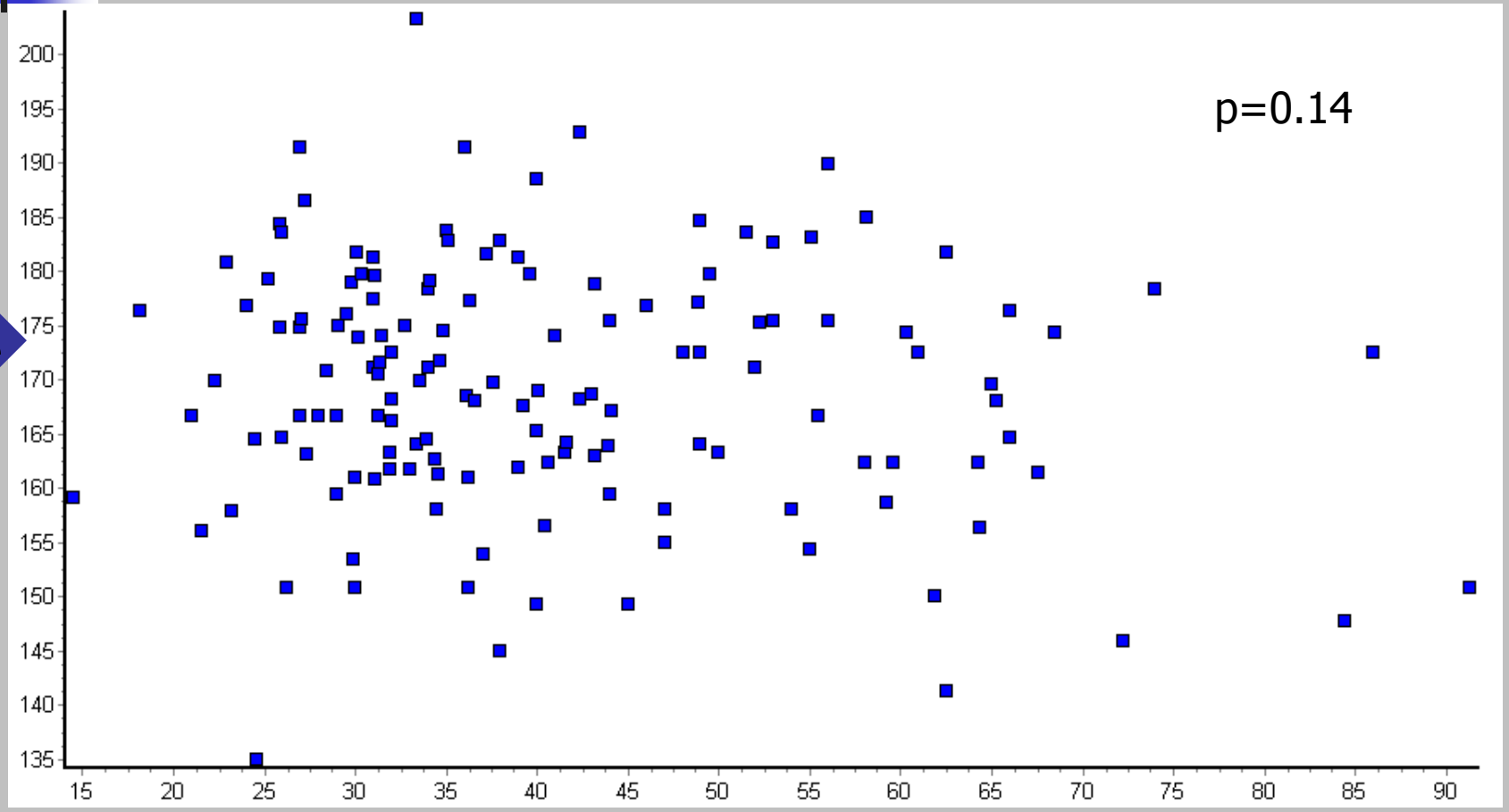


Results: Implant Quality

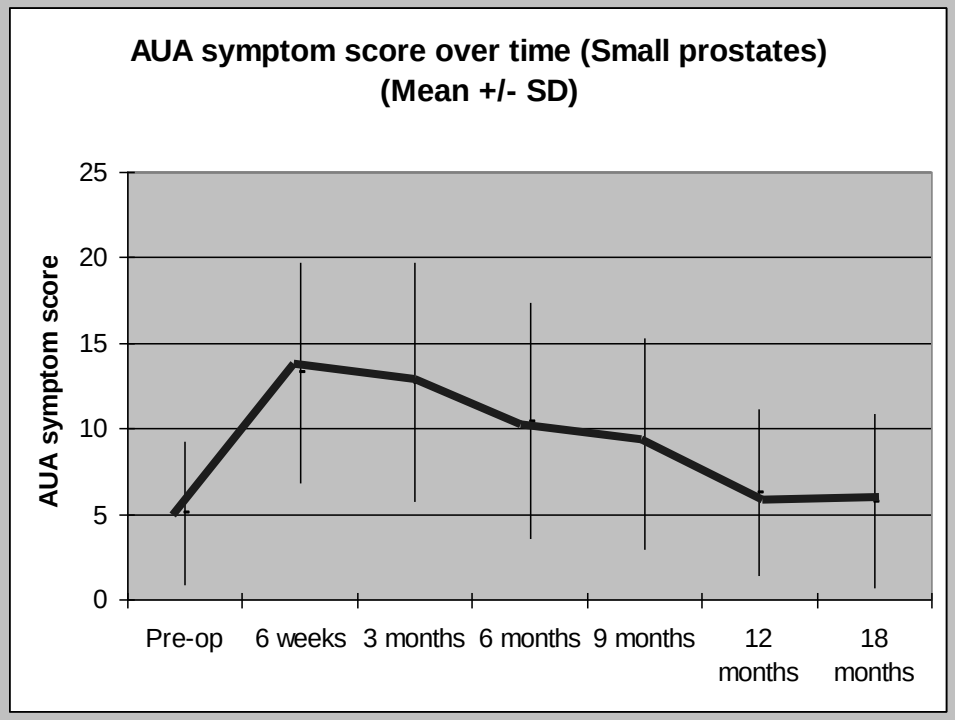
	Volume (cc)	IO D90 (Gray)	PO D90 (Gray)	PO V100 (%)	PO V150 (%)
Large (≥50cc) n=38	61 (50-91)	169 (141-190)	160 (123-197)	94 (83-100)	68 (48-91)
Small (<50cc) n= 117	33 (14-49)	170 (135-203)	164 (123-196)	94 (80-100)	69 (40-83)
p value (Mann-Whitney)	**<0.01**	**0.38**	**0.75**	**0.28**	**0.80**

D90 vs Gland Volume

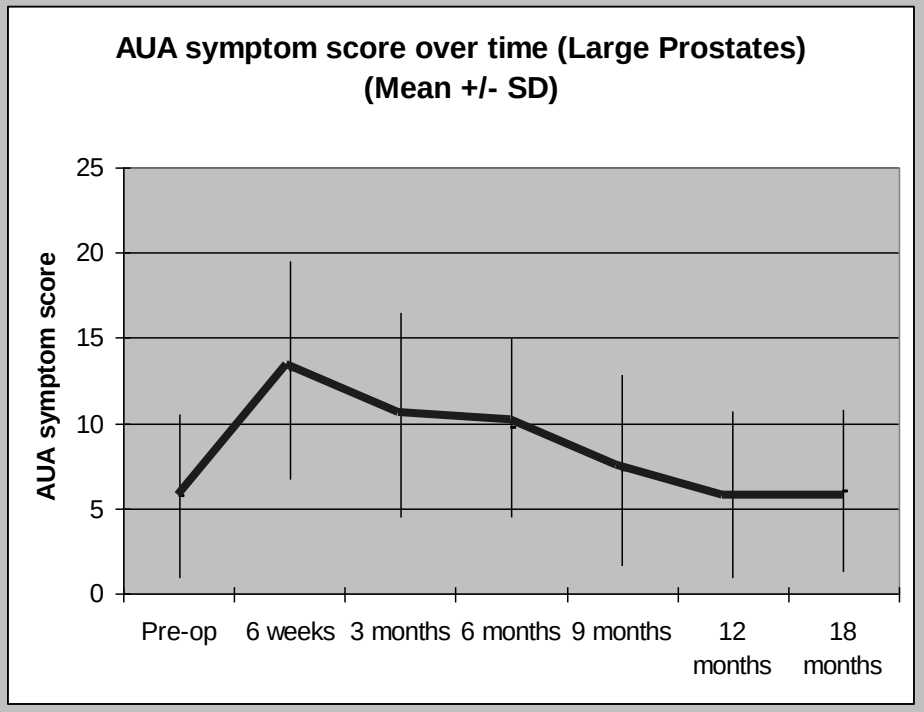
Acher et al BJUI 2006



Urinary Morbidity



Small (<50cc)



Large (≥50cc)

Retention of Urine

	Large (≥50cc) n=38	Small (<50cc) n=117	Total
Retention of Urine	2 (5%)	3 (3%)	5 (3%)
Passed TWOC	1	3	4
Delayed TUR(P)	1- retention 1- symptoms	0	2

Intra-operative Dosimetry

"Pushing the Boundaries"

- Large Prostates
  - Patient LUTS assessment with Flow Rate ? UDS
  - Teach CISC
  - Limited TURP may be required
  - Avoid hormone cyto reduction
- Previous TURP
  - Careful Assessment of Suitability
  - Cystoscopy & TRUS
- Limited TURP
  - Pre Implant ??

The Impact of TUR Surgery

- 191 pts without previous surgery
- 32 pts previous or planned TUR min 6 months prior to implant (Mean 8 g)
- Min 18/12 Follow up
- Outcomes studied
  - Dosimetric quality
  - Urinary morbidity (AUR & IPSS scores up to 18/12)
  - PSA Nadir

TURP & Brachytherapy Outcomes
A new gold standard ?

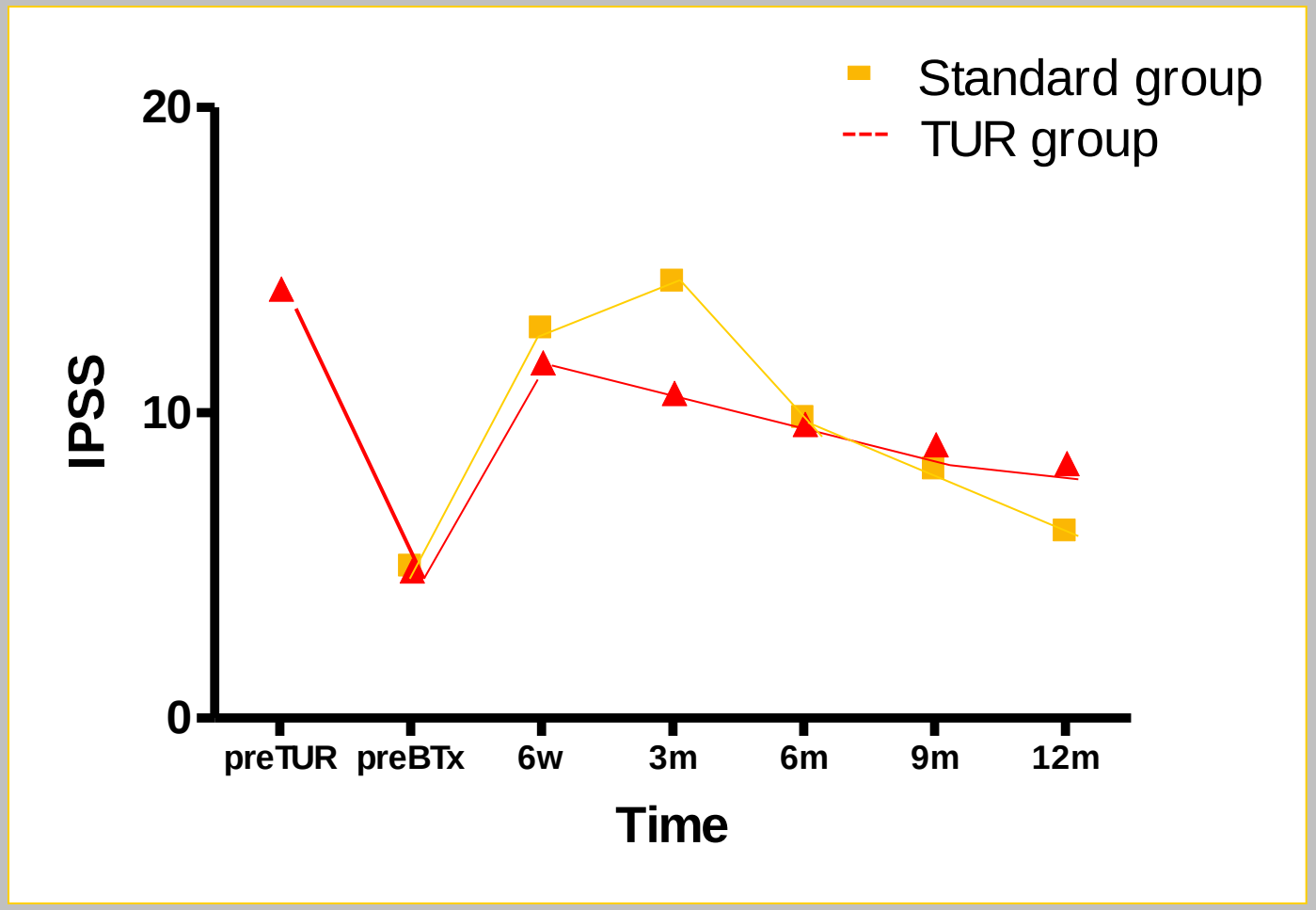
- No Outflow Surgery
  - N = 191
- Mean Vol = 34.5cc
- Min D90 = 116%
- Med Urethral V140 = 22%

- Acute Retention
  - N = 5
  - One stricture
- Mean PSA Nadir 1.3 @ 18/12

- Prev / Planned TUR
  - N = 32
- Mean Vol = 39.1cc
- Min D90 = 115%
- Med Urethral V140 = 3.7%

- No Acute Retention
  - No Incontinence
  - One Stricture
- Mean PSA Nadir 1.1 @ 18/12

Prostate Symptom Score

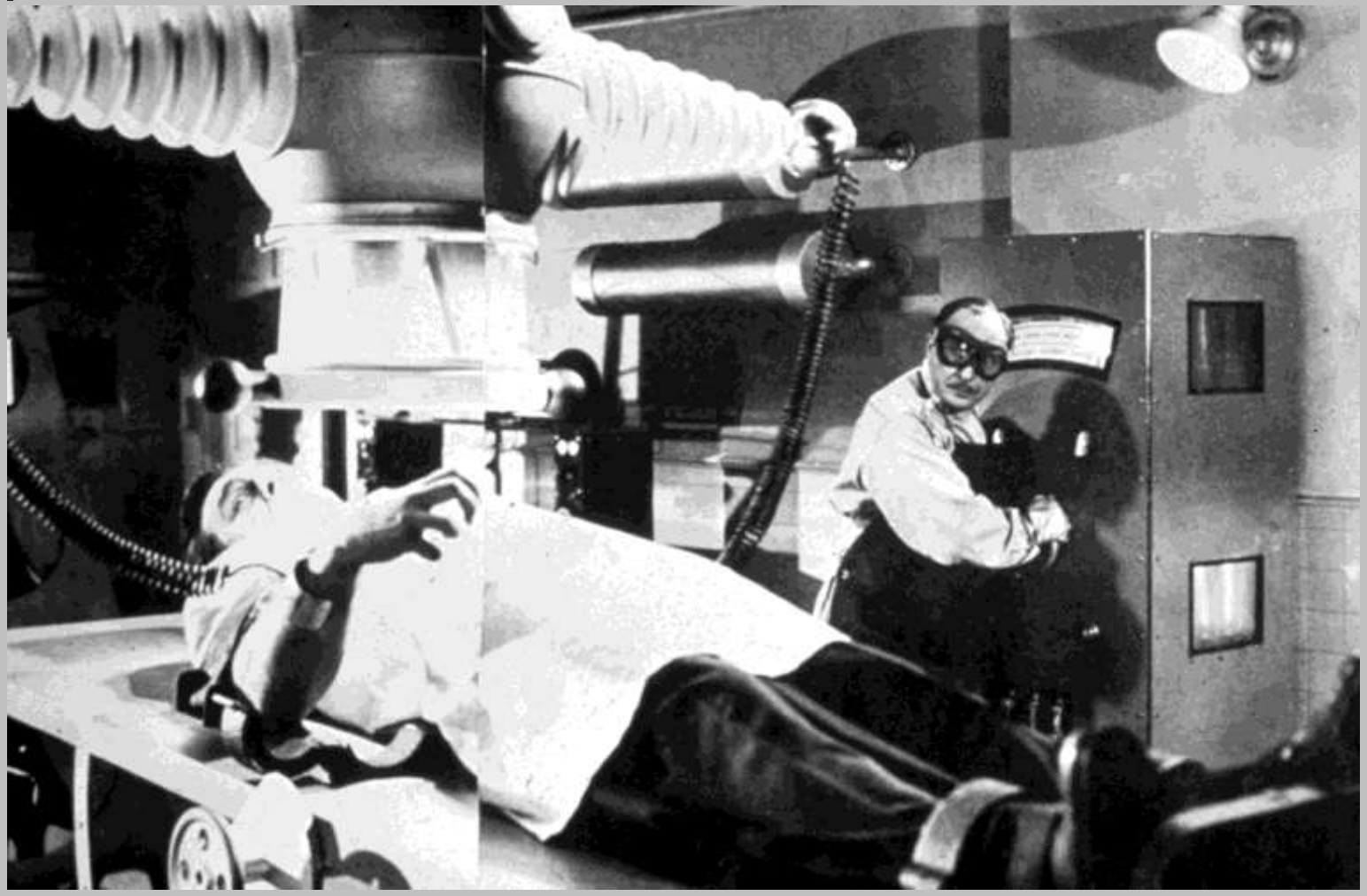


Intra-operative Brachytherapy

- Intraoperative brachytherapy well developed techniques
  - Single stage & Two stage
- High Implant Quality
  - Excellent dosimetry
- Low Morbidity
  - Urethral and rectal dosimetry
- Uniquely Versatile
  - Pubic arch interference
  - Large prostates
  - Previous / Planned TUR Surgery

Robotic Surgeon "resort to sabotage"

Treatment Planning Critical



Thank you for your attention