Radical Prostatectomy
Handling and Reporting

Murali Varma
Cardiff, UK
wptmv@cf.ac.uk

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Data from Radicals

- **Why data collected**
  - Adjuvant Rx: radioRx, hormones, ?chemo
  - Prognostication
  - Clinical trials
  - Research
  - Audit of surgery
    - Selection of patients
    - Surgical technique

Data from Radicals (2)

- **What data collected**
  - Gleason grade
  - Stage
  - Margin status
  - (Tumour volume)

Data from Radicals (3)

- **How data collected**
  - Handling
  - Reporting
- **Issue based discussion**
  - Points of controversy discussed

Handling Radicals

Submission to lab:
Fresh or fixed

- **Submit fresh if required for research**
- **Problems**
  - Prostate cancer generally not grossly obvious
  - Sampled tumour may not be dominant tumour
    - Results misleading if wrong tumour tested
  - Slicing fresh prostate may distort specimen and disrupt margins
    - Always ink before slicing
  - Risks delay in fixation

Who should "cut-up" radicals?

- **Doctor or technical staff?**
  - PSA detected cancers not grossly identified
  - Protocol driven, little judgment
    - All submitted or standard
  - Ideal specimen for trained technical staff?

Issues: Handling

- **Inject formalin into specimen?**
  - Avoids "crust effect": cross-linking of proteins in superficial prostate hinders further diffusion to centre
  - Not necessary for morphology
  - Improves preservation for molecular tests?
- **Ink?**
  - Yes, at least two colours (right vs. left)
  - Bouin's or acetic acid can help fix ink
  - Do not ink medial lobe nodule at base
    - Lined by urothelium; not specimen margin

Macroscopic description

- **Size in 3 dimensions**
  - Prostate is irregular
  - Base to apex distance shorter anterior compared to posterior
    - No clear guidance how to measure
  - No clinical significance
- **Weight**
  - Easier to determine
  - More reproducible
  - Record weight without seminal vesicles
    - Weight misleading if small prostate and large seminal vesicles
    - Leave base of seminal vesicles attached to prostate
  - No clinical significance

Apex and Base

- **Definitions**
  - No established definition
    - ?proximal and distal 5mm
    - ?proximal and distal 10mm
    - ?other
  - Radiology:
    - Proximal and distal 1/3rd of prostate!

Slicing Apex and Base: Cone or Shave?

- **Apex**
  - ISUP: always modified cone
    - Transverse slice followed by slices in sagittal plane
      - Not radial coning as in cervix (wedge shaped pieces are difficult to embed)
  - Apex cone shaped so difficult to embed margin flat in shave

Slicing Apex and Base: Cone or Shave?

- **Base**
  - ISUP: modified cone or shave
  - I recommend modified cone
    - Close negative margin will become positive in shave
    - Microscopic detrusor invasion easier to assess in cone
    - Base margin irregular so difficult to embed flat

Partial vs. Total Embedding

- **Partial sampling**
  - Several protocols described
  - Most submit entire apex and base margins
  - Hopkins group: all grossly visible tumour, all posterior gland and one mid-anterior section from each side
    - Sehdev et al. Hum Pathol 2001;32:494-499.
    - Detected >95% of all adverse features

Partial vs. Total Embedding

- **Advantages of partial embedding**
  - Time and cost saving
    - Fewer blocks to cut and examine
  - Tissue for research
  - Some protocols detect >95% adverse findings
- **Disadvantages of partial embedding**
  - Cancer generally not grossly visible
  - Tumour extent, EPE and margin positivity may be underestimated
  - Submitting additional material is time consuming

Standard Blocks or Megablocks

- **Advantages of megablocks**
  - Easier to map tumours esp. when multifocal
  - Fewer blocks to cut
- **Problems with megablocks**
  - Thicker slices so less margin examined
  - Needs special equipment, more expensive
  - Immunohistochemistry more difficult
  - Slides have to be filed separately
- **Either is acceptable**

Seminal Vesicles and Vas Margin

- **Seminal vesicles**
  - No need to submit all of SV
  - Must submit junction of prostate and SV
- **Vas margin**
  - Not necessary
  - Rarely involved in the absence of SV involvement

Reporting Issues

Tumour Volume

- Significantly correlated with grade, stage and margin status
- Predicts prognosis in univariate but not multivariate analysis
- Difficult and time consuming to determine accurately
- ISUP 2009 recommended % area involved by cancer
  - However, illogical to “add up” multiple foci of tumour
- Maximum diameter of dominant tumour correlates with tumour volume

Gleason Grading

- **Multifocal tumours**
  - Grade largest tumour (usually also highest grade)
  - If smaller tumour with higher grade: report grade of that tumour also
- **More than 2 grades**
  - Report tertiary grade if higher than primary and secondary
  - Epstein recommends including higher tertiary grade in the Gleason score if >5%

Extraprostatic Extension (EPE)

- Even focal EPE is a significant predictor of recurrence in node negative patients
- Tumour invading fat or bulging beyond outline of prostate
- EPE difficult to assess at apex and base
  - Tumour in skeletal muscle at apex is not EPE
- Location of EPC not clinically important
- Important to distinguish focal from non-focal (established or extensive) EPE
  - Focal: up to 1 HPF in up to 2 sections
  - Non-focal has significantly higher recurrence risk than focal

Seminal Vesicle Invasion (SVI)

- **Invasion of muscular wall of SV outside prostate**
  - Invasion of intraprostatic SV or ejaculatory duct is not SVI
  - Invasion of fat or adventitia around seminal vesicle is not SVI
- **Bilaterality and extent of SVI not important**
- **Three types described; significance uncertain**
  - Direct extension from prostate into SV
  - Tumour extending into periprostatic fat and then into SV
  - Discontinuous focus of tumour in SV

Bladder Neck Invasion (BNI)

- Smooth muscle within prostate blends with detrusor
  - No clear boundary between prostate and bladder
- Tumour in thick smooth muscle at base reported as BNI only if no benign prostate glands present at this level
- Tumour at base margin is also BNI
  - Plane of surgery is through bladder neck
- BNI classified as pT3a and not pT4

Positive Surgical Margin (PSM)

- **Tumour cells at inked margin**
  - Close but not touching inked margin is negative
    - Beware of ink extending inside specimen through cracks
- **May be extraprostatic or intraprostatic**
- **Extent of PSM may predict recurrence**
  - Focal vs. non-focal/extensive
    - No consensus regarding definition of focal
  - ICCR recommends linear length of PSM

pT2 substaging

- **3 substages (7th edition TNM):**
  - pT2a: up to ½ of one side of prostate
  - pT2b: > ½ of one side of prostate
  - pT2c: tumour involves both sides of prostate
- **Problems:**
  - pT2b almost nonexistent: tumour involving > ½ of one side of prostate will extend across midgland
  - Small midline tumour and small bilateral multifocal tumours would be pT2c!
- **ISUP 2009: pT2 substaging not recommended**