Intra-operative assessment of RP surgical margins

the patient’s and pathologist’s view

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Radical prostatectomy

International Collaboration on Cancer Reporting (ICCR)

Required data elements for reporting:

- histological type
- grade (Gleason score, Grade group)
- extraprostatic extension
- seminal vesicle and bladder neck invasion
- surgical margin status

Kench, Virch Arch 2019
Surgical margin status

The pathologist’s view

The urologist’s view

The patient’s view
Pathological assessment

Required and recommended data elements (ICCR):

- involved/ not involved
- location of positive margin
- type of positive margin
- extent of positive margin
- Gleason pattern at positive margin

Kench, Virch Arch 2019
Positive surgical margin

- Tumour should be present in the ink

- Location of positive margin
  - quality control for urologist
  - posterolateral has adverse impact

- Type of positive margin
  - capsular incision increased risk of recurrence

Chuang, J Urol 2007; Eastham, Urology 2007
Positive surgical margin

- Extent of positive margin
  - HR 1.08 per mm
  - < 1mm no increased BCR

Shikanov, J Urol 2009; Hollemans, submitted
Positive surgical margin

- Gleason pattern at margin

- no additional value of cribriform in margin

Brimo, Urology 2009; Cao, AJSP 2010; Hollemans, submitted
The urologist’s view

Post-operative decision-making

- Surgical margin assessment mostly prognostic
- Extensive positive margins – radiotherapy

Planning surgical procedure
Nerve-sparing radical prostatectomy
Nerve-sparing radical prostatectomy

Tewari, BJU Int 2011
The patient’s view

Urinary incontinence

Erectile dysfunction

Nerve-sparing:
- no: 70%
- uni-lat: 50%
- bil-lat: 30%

Steineck, Eur Urol 2015; Suardi, BJU 2012; Nguyen, J Urol 2017
The patient’s view: optimal balance

Maximal nerve-sparing surgery  No increase positive surgical margins

Urinary incontinence  Biochemical recurrence
Erectily dysfunction  Adjuvant therapy

Clinical decision-making on nerve-sparing surgery?

- subjective
- biopsy tumour grade and volume
- MRI, clinical impression during operation
Neurovascular Structure-adjacent Frozen-section Examination (NeuroSAFE) Increases Nerve-sparing Frequency and Reduces Positive Surgical Margins in Open and Robot-assisted Laparoscopic Radical Prostatectomy: Experience After 11 069 Consecutive Patients

Thorsten Schlomm\textsuperscript{a,b,*,}, Pierre Tennstedt\textsuperscript{a,†}, Caroline Huxhold\textsuperscript{a,†}, Thomas Steuber\textsuperscript{a}, Georg Salomon\textsuperscript{a}, Uwe Michl\textsuperscript{a}, Hans Heinzer\textsuperscript{a}, Jens Hansen\textsuperscript{a}, Lars Budäus\textsuperscript{a}, Stefan Steurer\textsuperscript{c}, Corinna Wittmer\textsuperscript{c}, Sarah Minner\textsuperscript{c}, Alexander Haese\textsuperscript{a}, Guido Sauter\textsuperscript{c}, Markus Graefen\textsuperscript{a}, Hartwig Huland\textsuperscript{a}
NeuroSAFE outcome: Hamburg

- > 5000 patients received NeuroSAFE
- 25% had positive surgical margin at NeuroSAFE

- More nerve-sparing surgery: from 81% to 97%
- Less positive surgical margins: from 22% to 15%

- No difference in BCR

Schlomm, Eur Urol 2012
NeuroSAFE outcome: UK

- 120 patients received NeuroSAFE
- More nerve-sparing and less positive surgical margins
- Less urinary incontinence: from 29% to 14%
- Less erectile dysfunction: from 49% to 23%
- Start randomized trial

Mirmilstein, BJU Int 2018; Dinneen, BMJ Open 2019
NeuroSAFE: future perspective

- More nerve-sparing and less positive surgical margins
- Indications of better functional outcomes
- Labour-intensive for pathology department
- Randomized clinical trial ongoing
- Selection of patients having benefit from NeuroSAFE?
Alternative frozen section techniques

- Labour-intensive for pathology department:
  - 8-20 frozen sections per patient
  - 3-5 technicians working on 2-4 cryostats
  - 20 min pathologist time

- Alternative frozen section techniques?
  - poor standardisation
  - variable outcome
Take home messages

- Detailed pathologic evaluation of surgical margins (location, length, Gleason pattern) important for surgical quality control and prognosis

- Surgical balance: maximal nerve-sparing versus oncological outcome

- Intra-operative frozen section might reduce post-operative complications, but clinical trials necessary
Thank you!