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Overview: Case Presentation

- Case presentation
  - Clinical data
  - Imaging Findings
  - Management Decision and Outcome
- Background of Management Considerations
- Translational Technologies In Use
- Future Directions
Case Presentation: Clinical Data

- 58 year-old man
  - Erectile dysfunction, but no incontinence
  - Hyperlipidemia and glucose intolerance
- Prostate cancer diagnosed outside ½ year earlier by biopsy, Gleason 3+3=6 (% of cores unknown, but minimal)
- PSA 2.6
  - Unclear why biopsy was performed
Case Presentation: Imaging

- Axial and coronal T2-weighted images show intact capsule but abnormal signal
- Diffusion-weighted image shows scattered foci of impaired diffusion
- Spectroscopy shows diffusely abnormal choline
Case Presentation: Management and Outcome

- Because of extensive abnormal spectroscopy suggesting diffuse disease, surgery was recommended
- Uncomplicated robotically-assisted laparoscopic radical prostatectomy (RALP) and lymph node dissection
- Multifocal Gleason 3+3=6 carcinoma, high-grade prostatic intraepithelial neoplasia
  - Margins and lymph nodes negative
  - PSA currently undetectable
Management Considerations:

Background

- Carcinoma of the prostate (CaP) is the most commonly diagnosed non-cutaneous cancer in American men.
- However, the death rate is much lower than for many other cancers.
- Although there is no premalignant form, management of small volume, low grade disease is controversial.
Management Considerations: Conventional Work-Up

- Standard screening includes digital rectal examination (DRE) and serum prostate specific antigen (PSA)
- Prostate biopsy if either abnormal
  - Sextant, 2 cores each
  - Ultrasound-guided, but not targeted
  - Sample: 30% are understaged by grade
  - Men over 50: 80% are negative
- Normograms for staging
**Management Considerations:**

**Low Grade Disease**

- Management is controversial because conventional staging is inaccurate
  - Surgery
  - Active surveillance
- RALP decreases but does not obviate risk of nerve injury
- Decision for active surveillance could be improved if staging were clearer
Management Considerations: Minimally Invasive Surgery

- Conventional nerve sparing radical prostatectomy relies on haptic feedback in the assessment of the neurovascular bundle (NVB).
- NVB preservation improves post-operative continence and potency.
- Visualization of the NVB is improved with RALP, at the cost of haptic feedback.
Translational Technologies

- MRI solves two problems
  - Differentiates between low- and high-volume disease for surveillance
  - Differentiates organ-confined from advanced disease
- Because anatomic imaging can be unclear, approach is multiparametric
  - Diffusion-weighted imaging: cellular density
  - Dynamic contrast enhancement: vascularity
  - Spectroscopy: chemical constituents (turnover)
Future Directions

- We recently retrospectively evaluated surgical planning in 19 consecutive men who underwent RALP after MRI
  - 6 (32%) underwent more aggressive nerve sparing technique based on MRI
  - 4 (21%) underwent more conservative nerve sparing technique
- A multicenter trial of prostate MRI for screening will start soon
Future Directions

- Retrospective review of additive value of each component of prostate MRI
- Transition to higher-field MRI without endorectal coil
- Translation of prostate techniques to other organs
  - Addition of respiratory compensation
  - Deconvolution of complex blood supply
End of Presentation

Questions?