The Anatomy of Success

Bill McLaughlin MD
University of Michigan
No Disclosures

Thanks

Jim Montie MD
Modern Success: Cure with Quality of Life

Lancet Oncology 2016
Re-imagining Toxicity and QOL

• Cure is QOL!
  – Cancer is an intolerable toxicity
  – The greatest toxicity you will ever cause is failure to cure an aggressive cancer
  – Brachy dramatically increases cure rates in aggressive cancers

• Preserving function
  – Loss of a positive is a form of toxicity

• Avoiding life altering toxicity
Re-imagining Toxicity
QOL Spectrum

Severe Irreversible  Severe Reversible  Minor Medication Reversible  Zero Preservation  Partial Preservation Medication  Full Preservation No Meds

Gain of a Negative  Loss of a Positive
Re-imagining Toxicity
QOL Spectrum

Severe Irreversible
Severe Reversible
Minor Medication Reversible
Zero Preservation
Partial Preservation Medication
Full Preservation No Meds

Gain of a Negative
Loss of a Positive
Limiting toxicity
Preserving Function

• Improving cure
  – aggressive cancer is the ultimate toxicity
  – mp MRI

• Limiting acute toxicity
  – Bladder neck affects account for almost all acute toxicity

• Avoiding Rectal fistula
  – The Bermuda Triangle

• Avoiding Strictures of the External Sphincter
  – Apex as Ground Zero

• Preserving sexual function
Limiting dose to the bladder neck limits acute toxicity
A Modest Proposal

• Make sure the tumor area is well covered
• Back off on the free and clear zones
  – Limits needless toxicity from whole gland dose escalation
• mpMRI plus brachy is the ultimate synergy
Disaster Avoidance

• Rectal Fistula

• Stricture
Mechanism of Rectal Fistula
Bermuda Triangle – seeds dropped below the apex in this region end up closer to the rectum than they appear on US.
Seeds below the prostate
Preferred offset – seeds immediately above the rectum should be placed superior to ideal grid (NEVER BELOW) and should be within the prostate.
Limiting Rectal Toxicity: Thinking 2D in a 3D world
Gradient Optimization
Rectal DVH
External Sphincter/Strictures

Coakley et al. 2002 Journal of Urology
External Sphincter

Intra-prostatic sphincter not emphasized until recently

Coakley et al. 2002 Journal of Urology
Apex - Schematic

Dorsal Venous Plexus

External Sphincter

Pure PZ
XRT Planning - Apex
Stricture avoidance

• Limit length of high dose
• Know the apex anatomy
Vessel Sparing

• 90% self report able to be sexually active at 5 years
  – No difference for combination
  – No difference for hormones
Erectile Tissues
Neurovascular Bundle
Neurovascular Plexus
Bladder Neck Schematic
Bladder Neck Schematic
Bladder Neck Schematic
Bladder Neck Schematic
Bladder Neck Schematic
Bladder neck
Bladder neck
Symptomatic median lobe
“Golf Tee” TUR

Standard TUR

“Golf Tee” TUR
12 years Post TUR
- Within tumor / disaster potential
- Adjacent to tumor / disaster potential
- Within prostate / complication potential
- Adjacent / complication potential
- Separable / complication potential
Summary

• Cure is the ultimate toxicity avoidance
  – there is no complication like death
  – mpMRI

• Rectal fistulas
  – Understand the Bermuda Triangle
  – Offset form ideal grid

• Strictures
  – Understand Ground Zero

• Bladder neck – acute toxicity avoidance