NEPHRON-SPARING TECHNIQUES FOR UPPER TRACT UROTHELIAL CANCER (UTUC)

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DISCLOSURES

- Consultant – Boston Scientific Corporation (BSC)
- Consultant – Karl Storz Endoscopy America (KSEA)
- Consultant – Lumenis
LEARNING OBJECTIVES

• As a result of participating in this activity, the participant will be able to describe the classic and the contemporary staging for UTUC

• As a result of participating in this activity the participant will be able to describe AUA, NCCN and EAU management guidelines for UTUC

• As a result of participating in this activity the participant will be able to describe three nephron-sparing techniques to treat UTUC
PEER REVIEWED REFERENCES


62 yo otherwise healthy male with a solitary kidney is referred to you after undergoing ureteroscopy as part of a work-up for hematuria and abnormal CTU. He was found to have a 1.5 cm renal pelvis tumor with pathology consistent with low grade UTUC. You recommend:

- A– Radical nephroureterectomy without bladder cuff with chemotherapy
- B– Radical nephroureterectomy with bladder cuff without chemotherapy
- C– Ureteroscopy with laser ablation with chemotherapy and BCG thereafter
- D– Percutaneous renal endoscopy with tumor resection
- E– Chemotherapy and BCG only
BACKGROUND OF UTUC

• Represents only 5% of ALL urothelial cancers

• 5 year cancer specific survival 75%
  • Grade and Stage are the most predictive of survival

• GOLD STANDARD – Radical nephroureterectomy (RNU) with bladder cuff en bloc resection
GRADE

WHO
• G1
• G2
• G3

CONTEMPORARY
• PUNLMP
• Low Grade
• High Grade
<table>
<thead>
<tr>
<th><strong>Primary Tumor</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TX</strong></td>
<td>Tumor cannot be assessed</td>
</tr>
<tr>
<td><strong>T0</strong></td>
<td>No Evidence of Primary Tumor</td>
</tr>
<tr>
<td><strong>Ta</strong></td>
<td>Papillary Noninvasive Tumor</td>
</tr>
<tr>
<td><strong>Tis</strong></td>
<td>Carcinoma in Situ</td>
</tr>
<tr>
<td><strong>T1</strong></td>
<td>Invasion of Subepithelial Connective Tissue / Lamina Propria</td>
</tr>
<tr>
<td><strong>T2</strong></td>
<td>Invasion of Muscularis Propria</td>
</tr>
<tr>
<td><strong>T3</strong></td>
<td>Invasion of Renal Parenchyma or Peripelvic / Periureteral Fat</td>
</tr>
<tr>
<td><strong>T4</strong></td>
<td>Invasion of Adjacent Organs or through parenchyma into Perinephric Fat</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Regional Lymph Nodes</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NX</strong></td>
<td>Regional Nodes cannot be assessed</td>
</tr>
<tr>
<td><strong>N0</strong></td>
<td>Negative Nodes</td>
</tr>
<tr>
<td><strong>N1</strong></td>
<td>Single Node &lt;2cm</td>
</tr>
<tr>
<td><strong>N2</strong></td>
<td>Single Node 2-5cm; Multiple Nodes &lt;5cm</td>
</tr>
<tr>
<td><strong>N3</strong></td>
<td>Multiple Nodes &gt;5cm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Metastasis</strong></th>
<th><strong>Description</strong></th>
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</thead>
<tbody>
<tr>
<td><strong>M0</strong></td>
<td>No distant metastasis</td>
</tr>
<tr>
<td><strong>M1</strong></td>
<td>Distant Metastasis</td>
</tr>
<tr>
<td><strong>TX</strong></td>
<td>Tumor cannot be assessed</td>
</tr>
<tr>
<td><strong>T0</strong></td>
<td>No Evidence of Primary Tumor</td>
</tr>
</tbody>
</table>
WORK-UP

- Endoscopy
  - Cystoscopy
  - Ureteropyeloscopy
- Urine sampling
- Imaging
  - CTU
  - MRU
  - US – Endoluminal and/or abdominal
WORK-UP – LIMITATIONS OF BIOPSY

• Ureteroscopic biopsy
  • <50% correlation to final pathology
  • 1 mm Cup size

• BIGopsy
  • Cook Medical product
  • 4 mm cup size
  • Ureteral access sheath required (instrument is back-loaded)
  • Visualization can be challenging

• Percutaneous endoscopic biopsy
  • Access technique
  • Avoiding dispersion of tumor cells
TREATMENT—AUA GUIDELINES

- No specific guidelines
- For RNU
  - Ipsilateral adrenalectomy commonly performed
  - With or without Gerota’s Facia—?
TREATMENT – NCCN

RENAL PELVIS

- RNU +/- chemo
  - High grade
  - Large tumor
  - Parenchymal invasion
- Endoscopic resection/ ablation
  - Low grade
  - +/- BCG
  - +/- Chemo

URETER

- Upper
  - RNU +/- chemo
  - Endoscopic resection
- Mid
  - Low Grade
    - Segmental excision
    - Endoscopic resection/ ablation
    - RNU
  - High Grade
    - RNU +/- chemo
- Distal
  - Low Grade
    - Endoscopic resection/ ablation
    - RNU +/- chemo
  - High Grade
    - Distal ureterectomy with LND +/- chemo
    - RNU +/- chemo
TREATMENT – EAU

RNU
• Infiltrating
• High Grade
• Multifocal
• > 2 cm tumor burden

CONSERVATIVE MANAGEMENT
• Non-infiltrating
• Low Grade
• Unifocal
• < 2 cm tumor burden
SEGMENTAL RESECTION

• Proximal
  • Ileal interposition
  • Autotransplantation

• Mid
  • Ureteroureterostomy
  • Ileal interposition

• Distal
  • Distal ureterectomy with re-implantation
  • Consider Psoas hitch
URETEROSCOPIC TUMOR ABLATION

- *Theoretically* treat any tumor in any location
- Ideal < 1 cm
- Superficial
- Low Grade
- Holmium Laser—settings are *surgeon preference*
  - "High"Energy
  - Low Frequency—more control
PERCUTANEOUS ENDOSCOPIC RESECTION

- Renal access is key
  - Urologist obtained
  - Consider endoscopic guided (ureteroscopy)

- Instrumentation
  - 3 mm long laparoscopic instruments (bariatric set)
  - Long TUR-scope
  - Laser ablation

- Tract seeding
  - 2% risk
CASE PRESENTATION

- 81 yo male with
  - severe oxygen dependent COPD
  - CAD with poor ejection fraction
  - CHF
  - Cardiomyopathy
  - Permanent atrial fibrillation
  - AICD
  - Prior TIA
  - DM

- 2 cm renal pelvis tumor found during work-up for hematuria
- Cardiologist would not “clear” for general anesthesia
CASE PRESENTATION

OPTIONS

• RNU with bladder cuff
• Ureteroscopy with laser ablation
  • Likely staged
• Percutaneous renal endoscopy with tumor resection

ANESTHESIA

• General—highest risk
• Sedation—option
• Transurethral local and regional local block
PARA-VERTEBRAL BLOCK

• Block of the spinal nerve(s)
• Includes the dorsal and ventral rami including the sympathetic chain ganglion
• Ultrasound guided
• 30 hour block
• T10 – T12
CASE PRESENTATION

- Para-vertebral block
- Cystoscopy and with placement of a ureteral access sheath
- Prone positioning
- Renal access
  - Endoscopic guided
  - Fluoroscopic guided
- Tumor resection
  - 3 mm extended length laparoscopic instruments
  - Large biopsy
- Tract closure
CASE PRESENTATION

- Video
CASE PRESENTATION

• Final pathology—Low grade non-invasive

• Follow-up retrograde endoscopy
  • NO residual tumor
CASE BASED SCENARIO

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