Transurethral Endoscopic Ultrasound to Assess Tumor Stage in Bladder Cancer

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Background

• Endoscopic ultrasound is utilized in tumor staging of many luminal cancers
• Its utility in bladder cancer is poorly understood
• Transurethral ultrasound (TUEUS) has several potential advantages
  • No exposure to ionized radiation
  • Superior delineation of depth of invasion compared to CT and MRI
  • Can be done intraoperatively
  • Impact on clinical decision making/surgical planning
  • Lower cost
  • Possible provider reimbursement

Objective

• To evaluate the diagnostic accuracy of TUEUS in differentiating muscle invasive (MIBC) and non-muscle invasive bladder cancer (NMIBC) when compared to tumor pathology

Methods

• IRB approval obtained
• 14 patients with bladder cancer were enrolled
  • Evaluated with TUEUS prior to transurethral resection of bladder (TURBT)
  • A single surgeon examined 31 distinct bladder lesions by TUEUS
  • Final pathology was reviewed
  • Intraoperative assessment of depth of invasion as NMIBC or MIBC were correlated with final pathology
  • Sensitivity, specificity, negative and positive predictive values were calculated

Results

• 31 distinct bladder tumors evaluated among 14 unique patients
  • Two tumors were deemed to be muscle invasive bladder cancer on pathology
  • Remaining 29 were non muscle invasive bladder cancer
  • Size/location of tumor did not significantly impact outcomes
  • No adverse events

Table 2: Diagnostic Utility of TUEUS

<table>
<thead>
<tr>
<th>End Point</th>
<th>Percent [95% CI]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity</td>
<td>100% [100%, 100.0%]</td>
</tr>
<tr>
<td>Specificity</td>
<td>97% [90%, 100%]</td>
</tr>
<tr>
<td>Positive Predictive Value</td>
<td>50%</td>
</tr>
<tr>
<td>Negative Predictive Value</td>
<td>100%</td>
</tr>
</tbody>
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Discussion

• TUEUS had high sensitivity and specificity as well as excellent negative predictive value
• Low positive predictive value could be due to small number of MIBC tumors

Conclusions

• In this pilot study, we demonstrate that TUEUS is a safe procedure that has a high concordance with pathologic stage
• TUEUS is a promising tool that warrants further investigation for the local staging of bladder cancers

Disclosures

• This is a investigator initiated trial
• Endoscope was provided by Olympus
• Principal investigator is a consultant for Olympus