Radial EUS: the clinical impact of T-stage

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Treatment and outcome of patients with esophageal cancer is closely associated with primary tumor stage.
Esophageal Cancer

• *Endoscopic treatment*
  – T1m1-m3 (Barretts cancer)
  – T1m1-2 (SCC)

• *Surgical treatment*
  – T1/T2 N0 (5 years survival 70-80%)

• *Neo-adjuvant or palliative treatment*
  – T3/T4 N1 (5 years survival rate 20-40%)
Esophageal Cancer
Role of EUS T-Staging

• Evaluate early cancer for possible endoscopic management

• Staging for the initial triage of patient to receive treatment
  – Surgery, neo-adjuvant therapy or palliative treatment
Esophageal Cancer
Role of EUS T-Staging

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T1m
sm
Requirement on EUS T Staging

- **Curative endoscopic treatment**
  - T1m1-m3 (Barrett’s cancer)
  - T1m1-2 (SCC)

- **Surgery**
  - T1sm (Barrett’s cancer)
  - T1m3 (SCC)
Problems of EUS T staging

- Accuracy rate of differentiation T1m/T1sm*
  - Barretts cancer only 70-85%
- Differentiation between inflammation and tumor is difficult

Problems of EUS T staging

- EUS is not good enough for therapeutic decision making between endoscopic and surgical treatment in early esophageal cancer.

- The endoscopic features are sufficient for decision making whether an EMR can be performed.

- EMR is the best staging procedure in these cases.

- EUS is necessary only if an infiltration of the muscle layer is suspected which could cause perforation at EMR.
Esophageal Cancer
Role of EUS

• Evaluate early cancer for possible endoscopic management

• Staging for the initial triage of patient to receive treatment
  – Surgery, neo-adjuvant therapy or palliative treatment
EUS T Staging
Esophageal cancer

<table>
<thead>
<tr>
<th>T Stage</th>
<th>EUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>80.5%</td>
</tr>
<tr>
<td>T2</td>
<td>76%</td>
</tr>
<tr>
<td>T3</td>
<td>92%</td>
</tr>
<tr>
<td>T4</td>
<td>86%</td>
</tr>
<tr>
<td>Overall T</td>
<td>84%</td>
</tr>
</tbody>
</table>

*Analysis of 21 published reports*
# Depth of tumor invasion (T-status)

**Correlation between EUS and pathological results**

<table>
<thead>
<tr>
<th>EUS T-stage</th>
<th>Pathologic T-stage</th>
<th>n</th>
<th>% correct</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>pT1</td>
<td>pT2</td>
<td>pT3</td>
</tr>
<tr>
<td>uT1</td>
<td>27</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>uT2</td>
<td>11</td>
<td>27</td>
<td>15</td>
</tr>
<tr>
<td>uT3</td>
<td>1</td>
<td>33</td>
<td>86</td>
</tr>
<tr>
<td>uT4</td>
<td>-</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>66</td>
<td>102</td>
</tr>
</tbody>
</table>

- **Overstaging**
  - 12 (31%)
  - 36 (55%)
  - 1 (0.9%)
  - 6 (86%)

- **Understaging**
  - 3 (4.5%)
  - 15 (15%)

Problems of EUS T staging

- Stenosis in up to 30% of the cases
  - High perforation risk of 6.4%
  - Partial staging only at the site of the proximal margin of the stenosis has poor accuracy (33.3%)

Olympus Esophagoprobe MH-908

Binmoeller KF et al. *GIE* 1995
Olympus Esophagogoprobe MH-908
## EUS T Staging

Esophageal cancer using MH 908

<table>
<thead>
<tr>
<th></th>
<th>MH 908</th>
<th>Standard echoendoscope</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Complete staging</strong></td>
<td>95.2%</td>
<td>77.5%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>T stage accuracy</strong> (non transversable strictures)</td>
<td>82.8%</td>
<td>33.3%</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

EBUS echoendoscope (BF-UC 160F-OL8)

EUS FNA of lymph node for staging of esophageal cancer

Diameter: 6.2mm, Length: 60 cm
EBUS echoendoscope (BF-UC 160F-OL8)

EUS FNA of lymph node for staging of esophageal cancer

Diameter: 6.2mm, Length: 60 cm
Conclusion I

• EUS T staging is more accurate than CT (71% vs 42%)*
• Treatment decisions change in ca 35% of the patients based on the EUS results**
• mostly toward nonsurgical and palliative treatment (85%)**

Conclusion II

• Radial EUS T Staging is unsatisfactory
• In early esophageal cancer, EUS is only required if endoscopic features are inconclusive
• In advanced esophageal cancer, over- and understaging lead to low accuracy rate