Transhiatal Esophagectomy: Lower Mortality, Diminished Morbidity, Equal Effectiveness

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Resident Debate
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Esophageal Cancer in the US

- A highly lethal malignancy: 15% survival at 5 years
- 14,500 new cases per annum
- 14,000 deaths per annum
Surgery for Esophageal Cancer

- **Curative Intent:**
  Resection offers the best chance for cure

- **Effective Palliation:**
  Long term survival is close to 20%
Historical Perspective

- 1936: Transhiatal esophagectomy described
  Turner GC. *Lancet* 1936; 1:130

- 1946: Ivor-Lewis transthoracic esophagectomy
  Lewis I. *Br J Surg* 1946; 33:19

- 1978: Rediscovery of the transhiatal approach
  Orringer MB. *JTCS* 1978; 76:643
Transhiatal Esophagectomy

- **Exposure:** Upper midline laparotomy/Left cervical incision

- **Blunt dissection of the thoracic esophagus**

- **Cervical esophagogastric anastomosis**
Transthoracic Esophagectomy

- Exposure: Right Thoracotomy/Upper midline laparotomy

- Intrathoracic esophagogastric anastomosis
Does the transhiatal approach provide standard of care?

- Oncologic effectiveness
- Safety
- Complication rate
Oncologic Equivalence: Survival


Oncologic Equivalence: Survival


Overall survival

Stage III
Oncologic Adequacy: Locoregional Control

- No significant difference in recurrence rate between THE (20%) or I-L (32%) approach
  

- Rate of locoregional recurrence equivalent to en bloc transthoracic esophagectomy

  14% in THE and 12% in TTE
  
  Hulscher et al. NEJM 2002
A Prospective Randomized Comparison of Transhiatal and Transthoracic Resection for Lower-third Esophageal Carcinoma

Kenil-Mari Chu, MB, BChir, FRCSEd, Simon Y. K. Law, MB, BChir, FRCSEd, Mansor Fok, MB, BS, FRCS(Ed), John Wong, PhD, FRCS(Ed), FRACS, FACS, Hong Kong, China

Relationships between Operative Approaches and Outcomes in Esophageal Cancer

Rodney F. Pommier, MD, John T. Vetto, MD, Brian L. Ferry, MD, Thea J. Wilmarth, BS, Portland, Oregon

Comparison of Outcomes following Transhiatal or Ivor Lewis Esophagectomy for Esophageal Carcinoma

Lawrence Glech, M.D.,1 Ross C. Smith, M.D.,1,2 Christopher P. Bambach, M.D.,1 Alastair R. Brown, M.D.1
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TRANSHIATAL VERSUS IVOR-LEWIS OESOPHAGECTOMY: IS THERE A DIFFERENCE?

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“...no difference in the occurrence and sites of recurrence as well as survival in the two groups.”

“We conclude that transhiatal and Ivor-Lewis esophagectomies are comparable operations with equivalent survival rates.”

“...patients showed no difference in survival when compared by operation type.”

“The present study demonstrates no clear difference in long-term survival between THO and ILO.”
**Operative Mortality**

- 30-day mortality from meta-analysis was 6.3% for THE vs 9.5% for I-L
  

- Hospital mortality rate for THE in a series of 1085 patients was 4%
  
  **Orringer et al. Annals of Surgery 1999**

**Blood Loss**

- No difference in bleeding (526cc-TH vs 608cc-IL)
  
Potential Benefits

- Less impairment of pulmonary function
- Location of potential anastomotic leak
- Reduced postoperative pain
- Faster recovery
Thoracotomy is a Morbid Incision
## Postoperative Complications

<table>
<thead>
<tr>
<th>Variable</th>
<th>Transhiatal Esophagectomy (N=106)</th>
<th>Transhiatal Esophagectomy (N=114)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ventilation time — days</td>
<td>Median 1, Range 0–19</td>
<td>Median 2, Range 0–76</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>ICU–MCU stay — days§</td>
<td>Median 2, Range 0–38</td>
<td>Median 6, Range 0–26</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Hospital stay — days¶</td>
<td>Median 15, Range 4–63</td>
<td>Median 19, Range 7–154</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Pulmonary complications*</td>
<td>29 (27)</td>
<td>65 (57)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Cardiac complications</td>
<td>17 (16)</td>
<td>30 (26)</td>
<td>0.10</td>
</tr>
<tr>
<td>Anastomotic leakage†</td>
<td>15 (14)</td>
<td>18 (16)</td>
<td>0.85</td>
</tr>
<tr>
<td>Subclinical</td>
<td>9 (8)</td>
<td>8 (7)</td>
<td></td>
</tr>
<tr>
<td>Clinical</td>
<td>6 (6)</td>
<td>10 (9)</td>
<td></td>
</tr>
<tr>
<td>Vocal-cord paralysis‡</td>
<td>14 (13)</td>
<td>24 (21)</td>
<td>0.15</td>
</tr>
<tr>
<td>Chylous leakage</td>
<td>2 (2)</td>
<td>11 (10)</td>
<td>0.02</td>
</tr>
<tr>
<td>Wound infection</td>
<td>8 (8)</td>
<td>11 (10)</td>
<td>0.53</td>
</tr>
<tr>
<td>Postoperative complications — no. (%)</td>
<td>29 (27)</td>
<td>65 (57)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Hulscher et al. NEJM 2002
Complications: Anastomotic Leak

- Meta-analysis comparison of 2329 THE patients and 1904 I-L patients demonstrated a 16% cervical leak rate vs 10% intrathoracic leak

  Rindani et al. *Aust NZ J Surg* 1999

- Mortality rate >3x higher for intrathoracic leaks (69% vs 20%)

  Muller et al. *Br J Surg* 1990
Complications: Dysphagia

- Recurrent laryngeal nerve injury
  - Incidence ranges from 10-15%
  - With modifications in technique (ie. avoidance of metal retractors) rates as low as 3% can be achieved
  

- Dysphagia/Stricture
  - Early anastomotic dilations often needed
  - Approx 90% have mild to no dysphagia at followup

Supposed Advantages of the Ivor-Lewis Operation

- **Superior cancer operation**
  - The literature does not support this claim
  - Survival and disease-free rates are comparable even with radical en bloc extended TTE

- **Potential of massive intraoperative hemorrhage**

- **Lower anastomotic leak rate**

- **Avoids potential risk of recurrent laryngeal nerve injury and dysphagia**
Transhiatal esophagectomy is a safe operation

Esophagectomy without thoracotomy for esophageal cancer does not compromise survival rates

THE confers multiple advantages over the Ivor-Lewis approach
- Markedly decreased pulmonary-related morbidity
- Potentially lethal sequelae of an intrathoracic leak
- Shorter hospital stay
Final Thoughts

- There are no adequately powered prospective, randomized trials that provide a compelling argument for either approach.

- Volume-outcome relationship highly relevant in any discussion of esophageal surgery.