Laparoscopic Hellar’s cardiomyotomy

James Catton
Consultant Oesphago-gastric Surgeon
Heller’s Cardiomytomy

Surgery for achalasia

40 year old lady with achalasia newly diagnosed

“Laparoscopic Heller’s cardiomytomy is the current gold standard management in the UK”
Heller’s Cardiomyotomy

Surgery for achalasia

• Laparoscopic Heller’s cardiomyotmy
• -How you get it
• -What we do

• Controversies

• Surgery vs. Dilation
• Surgery Vs. POEM

What I would do?

Nottingham University Hospitals
Heller’s Cardiomyotomy

High resolution Manometry

1. Impaired relaxation
2. Absent peristalsis
Heller’s Cardiomyotomy

Type I (‘classic achalasia’)
absence of oesophageal pressurization

Type II: panoesophageal pressurization

Type III: spastic contractions
Heller’s Cardiomytomy

1914 Ernest Heller
- Anterior and posterior mytomies
- Extending 8cm or more in oesphagus and stomach
Laparoscopic Cardiomyotomy

- Laparoscopic operation
- Pneumopertioneum
- 5 Ports
- Excellent views of the hiatus

From Hunter
Laparoscopic Cardiomyotomy

• “Myotomy”
  – Full thickness
  – Up to diaphragm
  – On to stomach
    (through fat pad)
  – Thermal injury?
    • Diathermy?
    • Ultrasonic?
    • “tear”
Laparoscopic Cardiomyotomy

Does the addition of a fundoplication improve outcomes for patients undergoing laparoscopic Heller’s cardiomyotomy?

-Mayo et al 2012

- 8 paper (2 RCT’S)
- Reflux Same
- Dysphagia slight worse with fuller Fundo
Long-Term Outcomes of Heller Myotomy

Treatment failures in 7% at 2 yrs, 10% at 5 yrs and 18% at 10 yrs—failure associated with lower preop LESP and sigmoid esophagus

Satisfactory results >90% at 5 years 75% at 15 yrs

Excellent/good results in 80% at 10 yrs and 65% at 20 yrs—failures due to GERD (Visick scores)
## Surgery vs. Dilation

<table>
<thead>
<tr>
<th></th>
<th>Heller myotomy (n=97)</th>
<th>Pneumatic dilation (n=85)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All patient without previous treatment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Successful treatment (%) (Eckardt score &lt; 3)</td>
<td>90%</td>
<td>86%</td>
</tr>
<tr>
<td>Eckardt score</td>
<td>1.1 ± 0.1</td>
<td>1.5 ± 0.1 (p = 0.06)</td>
</tr>
<tr>
<td>LES pressure (mmHg)</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Timed barium swallow (cm)</td>
<td>1.9</td>
<td>3.7</td>
</tr>
<tr>
<td>Abnormal pH</td>
<td>23%</td>
<td>15%</td>
</tr>
</tbody>
</table>


Nottingham University Hospitals NHS Trust
Surgery vs. Dilation

Laparoscopic Heller’s (LHM)
Surgeon experience: > 5 cases
106 cases at 14 sites over 5 years
1.5 cases/site/year
12% perforation rate during LHM
Myotomy only 1-1.5 cm onto stomach

Pneumatic dilatation (PD)
30% initial perforation rate
4% perf for PD after protocol revision

Surgery vs. Dilation

**Adverse Events**

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>LHM Events</th>
<th>Total</th>
<th>PD Events</th>
<th>Total</th>
<th>Weight</th>
<th>M-H, Fixed, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boeckxstaens 2011</td>
<td>1</td>
<td>106</td>
<td>4</td>
<td>95</td>
<td>46.1%</td>
<td>0.22 [0.02, 1.97]</td>
</tr>
<tr>
<td>Kostic 2007</td>
<td>0</td>
<td>25</td>
<td>2</td>
<td>26</td>
<td>26.6%</td>
<td>0.19 [0.01, 4.21]</td>
</tr>
<tr>
<td>Novais 2010</td>
<td>0</td>
<td>47</td>
<td>2</td>
<td>47</td>
<td>27.3%</td>
<td>0.19 [0.01, 4.10]</td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td><strong>178</strong></td>
<td><strong>168</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>178</strong></td>
<td><strong>168</strong></td>
<td><strong>20 [0.04, 0.96]</strong></td>
</tr>
</tbody>
</table>

Total events: 178

Heterogeneity: Chi² = 0.01, df = 2 (P = 1.00); I² = 0%

Test for overall effect: Z = 2.02 (P = .04)

**Response Rates**

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>LHM Events</th>
<th>Total</th>
<th>PD Events</th>
<th>Total</th>
<th>Weight</th>
<th>M-H, Fixed, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boeckxstaens 2011</td>
<td>91</td>
<td>106</td>
<td>76</td>
<td>95</td>
<td>62.8%</td>
<td>1.52 [0.72, 3.19]</td>
</tr>
<tr>
<td>Kostic 2007</td>
<td>24</td>
<td>25</td>
<td>20</td>
<td>26</td>
<td>4.3%</td>
<td>7.20 [0.80, 64.89]</td>
</tr>
<tr>
<td>Novais 2010</td>
<td>38</td>
<td>47</td>
<td>31</td>
<td>47</td>
<td>32.9%</td>
<td>2.18 [0.85, 5.60]</td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td><strong>178</strong></td>
<td><strong>168</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>178</strong></td>
<td><strong>168</strong></td>
<td><strong>1.98 [1.14, 3.45]</strong></td>
</tr>
</tbody>
</table>

Total events: 153

Heterogeneity: Chi² = 1.86, df = 2 (P = .39); I² = 0%

Test for overall effect: Z = 2.42 (P = .02)

**Heller vs. Pneumatic Dilation; Meta-analysis of RCTs**

(Yaghoobi, et al, GI Endosc 2013)

Nottingham University Hospitals NHS Trust
Surgery vs. Dilation

And at Five years.....

<table>
<thead>
<tr>
<th></th>
<th>Heller’s</th>
<th>Dilation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Success</td>
<td>84%</td>
<td>82%</td>
</tr>
</tbody>
</table>

But 25% of the dilation’s required further procedure.
“Based on these data, we conclude that either treatment can be proposed as initial treatment for achalasia”.

Long-term results of the European achalasia trial: a multicentre randomised controlled trial comparing pneumatic dilation versus laparoscopic Heller myotomy.
# Laparoscopic Cardiomyotomy

## Response Rates of Achalasia Treatments

Categorized by pressure topography subtype

<table>
<thead>
<tr>
<th>Achalasia subtype</th>
<th>Type I Classic</th>
<th>Type II, with compression</th>
<th>Type III spastic</th>
<th>All types</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Intervention</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Botulinum toxin</td>
<td>0% (0/2)</td>
<td>86% (6/7)</td>
<td>22% (2/9)</td>
<td>39% (7/18)</td>
</tr>
<tr>
<td>Pneumatic dilation</td>
<td>38% (3/8)</td>
<td>73% (19/26)</td>
<td>0% (0/11)</td>
<td>53% (24/45)</td>
</tr>
<tr>
<td>Heller Myotomy</td>
<td>67% (4/6)</td>
<td>100% (13/13)</td>
<td>0% (0/1)</td>
<td>85% (17/20)</td>
</tr>
<tr>
<td>All (any) interventions</td>
<td>44% (7/16)</td>
<td>83% (38/46)</td>
<td>9% (2/21)</td>
<td>56% (47/83)</td>
</tr>
</tbody>
</table>

Pandolfino JE et al, Gastroenterology 2008;135:1526

Heller myotomy (n=246) 85.4% (82/96) 95.3% (121/127) 69.6% (16/23) p<0.007

Salvador R et al. J Gastrointest Surg 2010;14:1635
Effect of endoscopic treatments before myotomy

Prior Botox resulted in increased symptoms of dysphagia, regurgitation and heartburn after laparoscopic Heller

-Finley et al 2010

Prior treatment increased failure rate:
3.7% to 16.8%
-Schuchert et al 2008
10.1% to 19.5%
-Smith et al 2006

Surgery?
Surgery vs. POEM
## Surgery vs. POEM

### Surgery or Peroral Esophageal Myotomy for Achalasia: A Systematic Review and Meta-Analysis.


#### Characteristics of Included Studies

<table>
<thead>
<tr>
<th>Author</th>
<th>Study Period</th>
<th>Country of Origin</th>
<th>Sample Size (M/F Ratio)</th>
<th>Age in Years*</th>
<th>Previous Myotomy/Interventions</th>
</tr>
</thead>
</table>
|                         |                       |                   | POEM                     | LHM           | POEM                           | LHM                  | POEM                      | LHM | FollowUp
| Bhayani et al18         | 2007–2012             | USA               | 37 (19/18)               | 56 (16)       | Dilatation, botox (details NR)  | NR                  | 12 |
| Ujiki et al19           | May 2009–Feb 2013     | USA               | 18 (13/5)                | 64,1 (4,8)    | Dilatation: 4,                | 4                   | 60,2 (4,7)    |     |
|                         |                       |                   |                         |               | botox: 2,                     |                     |               |     |
|                         |                       |                   |                         |               |                                 |                     |               |     |
|                         |                       |                   |                         |               |                                 |                     |               |     |
|                         |                       |                   |                         |               |                                 |                     |               |     |
| Hugness et al20         | Aug 2010–May 2012     | USA               | 12 (9/3)                 | 41 (12)       | None                           | 1 (details NR)       | 2  |
| Teitelbaum et al21      | Dec 2004–May 2012     | USA               | 18 (13/5)               | 38 (22–69)    | None                           | 10 (details NR)      | 12 |
| Von Renteln et al22     | NR                    | USA, DE, NL, CH, CA | 70 (40/30)             | 45            | None                           | NR                  | 3  |
|                         |                       |                   |                         | 34.5          | botox: 2,                      | 7                   |               |
| Teitelbaum et al24      | NR                    | USA               | 36 (25/11)              | 50 (15)       | Dilatation: 2,                 | 8                   |               |

**Botox = Botulinum toxin injection, CA = Canada, CH = Switzerland, DE = Germany, LHM = laparoscopic Heller myotomy, NL = Netherlands, NR = not reported, POEM = peroral esophageal myotomy, USA = United States of America.**

* Either mean (standard deviation) or median (range).

† Either mean or median.
Surgery vs. POEM

**Surgery or Peroral Esophageal Myotomy for Achalasia: A Systematic Review and Meta-Analysis.**
196 POEM vs. 290 LHM

- Success
- Operative time: **SAME**
- Analgesia
- Pain

Post Op stay shorter ?

**Nottingham University Hospitals**
Monitoring and follow up

- Small numbers
- Short follow up

Surgery?
Heller’s Cardiomyotomy

Surgery for achalasia

40 year old lady with achalasia newly diagnosed

What would I do? Surgery?
Monitoring and follow up

- No skin incisions
- Accurate and long Myotomy
- No disruption of the diaphragmatic hiatus
- No concurrent anti-reflux procedure
- Patients want it!
Treatment for Achalasia