Extremely weak evidence indicates that patients with myasthenia gravis may improve with trans-sternal thymectomy in addition to medical management.

Clinical Problem: A 24 year old woman with generalized myasthenia gravis (MG), stable for 6 months, with only intermittent ptosis, diplopia, bulbar weakness, while on pyridostigmine and azathioprine. She is anti-Ach Ab +, and has a normal CT chest.

Clinical Question: How much improvement can she expect with a thymectomy? What is the likelihood of “remission” and risk of morbidity and mortality following thymectomy?

Clinical Bottom Lines:
1. The evidence to support thymectomy is extremely weak (case series alone, no controls).
2. Perioperative mortality seems extremely low. 0/194 patients died within 1 year of surgery. Estimated probability of perioperative mortality not yet seen is 3/n = 3/194 = 1.6%.
3. Perioperative morbidity is 33% (64/194). Respiratory failure 6%, infection 11%, permanent nerve injury 2%, transient nerve injury 1%. (phrenic or recurrent laryngeal)
4. 73% (140/192) of patients achieved ≥1 Drachman class improvement within one year from thymectomy.
5. 83% (72/87) had sustained improvement of ≥1 Drachman class for ten years after thymectomy.
6. Odds ratios of being in ≥1 better Drachman class 6 months, 1, 2, 5 and 10 years post thymectomy with 95% CI are 6.2 (4.3-8.7), 9.8 (6.9-14.1), 13.2 (9.0-19.4), 23.5 (15.3-36.0), and 21.8 (12.1-39.4) respectively.
7. Pathologic diagnoses, age at time of surgery, and time from diagnosis to surgery were not significant predictors of improvement.
8. Probability of complete remission post-thymectomy varies from 14% to 69% in review of case series.

The Evidence:
1) Case series of 202 consecutive patients who underwent thymectomy for symptomatic MG from 1969 through 1996 at Johns Hopkins Hospital. Outcome was evaluated by a standardized scale (Drachman Classification) over 1 to 10 years (see comments).
2) Review of existing case series.

Data interpretation -Main article-:

<table>
<thead>
<tr>
<th>Improvement ≥1 Drachman class</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 months</td>
<td>6.2</td>
<td>4.3 - 8.7</td>
</tr>
<tr>
<td>1 year</td>
<td>9.8</td>
<td>6.9 - 14.1</td>
</tr>
<tr>
<td>2 years</td>
<td>13.2</td>
<td>9.0 - 19.4</td>
</tr>
<tr>
<td>5 years</td>
<td>23.5</td>
<td>15.3 - 36.0</td>
</tr>
<tr>
<td>10 years</td>
<td>21.8</td>
<td>12.1 - 39.4</td>
</tr>
</tbody>
</table>

Data interpretation -Review of series-:

<table>
<thead>
<tr>
<th>Author, year</th>
<th>n</th>
<th>mean follow-up</th>
<th>% complete remission</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hayat, 1995</td>
<td>21</td>
<td>3 years</td>
<td>14%</td>
</tr>
<tr>
<td>Detterbeck, 1996</td>
<td>100</td>
<td>5.5 years</td>
<td>29%mild, 69% severe</td>
</tr>
<tr>
<td>Masaok, 1996</td>
<td>286</td>
<td>20 years</td>
<td>50%</td>
</tr>
<tr>
<td>Bramis, 1997</td>
<td>76</td>
<td>4.8 years</td>
<td>25%</td>
</tr>
<tr>
<td>Bril, 1998</td>
<td>52</td>
<td>8.4 years</td>
<td>44%</td>
</tr>
</tbody>
</table>

Comments:
1. A selection bias likely exists. Criteria for referral to a surgeon are not indicated.
2. Patients poorly defined. Resistance to medical therapy pre-operatively not stated.
3. Inclusion and exclusion criteria for thymectomy are not explicit.
4. Follow-up is excellent (96-98%), but lost patients not included in analysis.
5. Concurrent medical therapy very poorly described.
6. The study protocol was not prepared before the data were acquired.
7. No statement of how Drachman scale was applied or by whom.
8. There are no controls.
9. Impossible to separate impact of surgical and medical therapy.
10. Although this weak evidence supports benefit and low risk of thymectomy, the true magnitude of these effects is unknown.

References:

Key Words: myasthenia gravis/ thymectomy/ treatment

Appraiser: Bart Demaerschalk and the UWO Evidence Based Neurology Group

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