What is the Evidence Base for Video Assisted Endoscopic Surgery for Thyroidectomy and Parathyroidectomy

N Agrawal

Citation

Abstract

Background

- Sung Dynasty 937 ad
- Kocher modern father thyroid surgery
- Well accepted technique
- Cosmesis generally satisfactory
- Postoperative pain usually not significant problem
- Paradigm shift to minimally invasive/endoscopic surgery

Figure 1

Figure 2

Parathyroid

- Gagner 1996 1st videoscopic parathyroidectomy
- Endoscopic Parathyroidectomy
- Minimally Invasive Video Assisted Parathyroidectomy
- Video Assisted Parathyroidectomy by lateral approach

Figure 3

Figure 4

Parathyroid MIVAP

- Miccoli et al
- 15mm incision suprasternal notch level
- Cervical midline opened
- CO₂ insufflation
- Dissection thyroid lobe blunt small instruments under endoscopic vision using 30° 5mm scope
- Bilateral exploration possible
What is the Evidence Base for Video Assisted Endoscopic Surgery for Thyroidectomy and Parathyroidectomy

Figure 5

**Miccoli et al**
- 137 pts sPHPT MIVAP 104 F/33 M
- 22-86 (58.2±13.5)
- Selected group single adenoma (uss, sestamibi)
- No previous neck surgery/large MNG
- Pth assay confirm complete removal hyperfunctioning tissue

Figure 6

**Results**
- Mean op time 54.3±22.6mins
- Conversion rate 8.8%
- 1 RLN palsy (0.7%)
- 1 persistent hyperparathyroidism
- 6 (4.4%) transient sympx hypocalcemia
- 113 overnight discharge 24 2nd postop day
- Mean fu 15.4±10.6mth all but 2 normocalcemic
- Cosmetic result rated excellent 92.8%, good 3.2%, acceptable 4.0%

Figure 8

**Contraindications**

<table>
<thead>
<tr>
<th>Absolute</th>
<th>Relative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous neck surgery</td>
<td>Previous neck irradiation</td>
</tr>
<tr>
<td>Large goitre</td>
<td>Adenoma larger than 3.5cm</td>
</tr>
<tr>
<td>Parathyroid carcinoma</td>
<td>Lack of preop localisation</td>
</tr>
<tr>
<td>MEN &amp; familial PHPT</td>
<td></td>
</tr>
</tbody>
</table>

Figure 9

**Advantages MIVAP**

<table>
<thead>
<tr>
<th>Not questionable</th>
<th>Questionable</th>
<th>Not Evident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cosmetic result</td>
<td>Costs</td>
<td>Length hospital stay</td>
</tr>
<tr>
<td>Postoperative distress</td>
<td>Postoperative hypoparathyroidism</td>
<td>Reduced operative time</td>
</tr>
</tbody>
</table>

Figure 7

**Discussion**
- 67% eligible and increasing
- Lesions not well localised MIVAP viable
- Criticisms
  - need for preop localization studies
  - Length and cost
  - Risk missing multiglandular disease

Figure 10

**VAP via lateral approach vs conventional surgery sPHPT**
- 68 each
- 12mm incision medial scm
- 10mm trocar 0° 10mm scope
- Low insufflation pressure
- 2 3mm trocars above and below 1st trocar
- Bilateral exploration not possible

(Images and text from Miccoli et al, Contraindications, Results, Advantages MIVAP, Discussion, and VAP via lateral approach vs conventional surgery sPHPT)
What is the Evidence Base for Video Assisted Endoscopic Surgery for Thyroidectomy and Parathyroidectomy

Figure 11

<table>
<thead>
<tr>
<th></th>
<th>VAP</th>
<th>CP</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operative time (min)</td>
<td>64.9</td>
<td>67.5</td>
<td>Ns</td>
</tr>
<tr>
<td>Complications</td>
<td>1/68a</td>
<td>4/68b</td>
<td>Ns</td>
</tr>
<tr>
<td>Postop stay</td>
<td>3.7</td>
<td>3.7</td>
<td>Ns</td>
</tr>
<tr>
<td>Analgesic need</td>
<td>0.48</td>
<td>1.66</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>VRS</td>
<td>4.95%</td>
<td>4.67%</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td></td>
<td>3.5%</td>
<td>3.26%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.7%</td>
<td></td>
</tr>
<tr>
<td>NS</td>
<td>9.7</td>
<td>9.2</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Figure 12

Thyroid

- Huscher 1st 1997
- 2 methods
- Endoscopic thyroidectomy
- MIVAT

Figure 13

Endoscopic Thyroidectomy

- GA
- Neck never hyperextended
- Continuous gas insufflation
- Central access
- 5mm 30° or 0° scope
- Transaxillary, nipple, submandibular avoid neck incision

Figure 14

MIVAT

- Central access
- Strap muscles retracted laterally conventional retractor
- No gas insufflation
- 5mm 30° scope through skin incision
- Dissection thyrotracheal groove under endoscopic vision using small instruments 2mm
- Haemostasis harmonic scalpel & clips

Figure 15

Indications

- Thyroid nodules <30mm diameter
- Thyroid gland volume <20 ml
- No hx thyroiditis
- No previous hx neck surgery
- No previous irradiation

Figure 16

MIVAT

- 67pts selected S4F 13M
- Mean age 40.5±12.8 (13-73)
- Preop biochem, uss, fna
- Preop dx:46 follicular lesion, toxic adenoma 6, small mng 3, low risk T1 papillary 12
- 51 lobectomies, 15 total thyroidectomies
- Mean op time 73.6mins & 109.6mins
- Conversion open 2% (3%)
- 2 transient postop hypocalcemia
- 1 transient RNI palsy
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Figure 17

Miccoli et al

- Mean largest diameter nodules 21.4mm±7.7 (9-30)
- Postop stay 24hrs
- Postop fu 7±5 months absence residual thyroid parenchyma
- 92.3% excellent cosmesis, 4.6% good, 3.1% acceptable

Figure 18

Comparison between MIVAT and Conventional Thyroidectomy

- Prospective randomised study
- 49pts 25 MIVAT 22F 3M 24 CT 21F 3M
- Mean age 38±12.5 (16-73) CT 39.9±12.8 (19-79)
- Thyroid nodule/small papillary ca
- Exclusion criteria
- Op time 66±24 mins vs 45±15 p=0.001
- Postop less painful MIVAT p=0.003

Figure 19

Comparison 1 month after operation

<table>
<thead>
<tr>
<th></th>
<th>MIVAT</th>
<th>CT</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>16</td>
<td>17</td>
<td>NS</td>
</tr>
<tr>
<td>Sex</td>
<td>13F 3M</td>
<td>17F</td>
<td>NS</td>
</tr>
<tr>
<td>Age</td>
<td>41.7±9.1y (29-60)</td>
<td>46.1±7.8y (25-60)</td>
<td>NS</td>
</tr>
<tr>
<td>Mean size tumour cm</td>
<td>1.3±0.4</td>
<td>2.1±1.9</td>
<td>NS</td>
</tr>
<tr>
<td>Mean 131-I uptake</td>
<td>5.1±4.9%</td>
<td>4.6±6.7%</td>
<td>NS</td>
</tr>
<tr>
<td>Mean serum Tg</td>
<td>5.3±4.9% Ng/ml</td>
<td>7.6±21.7 Ng/ml</td>
<td>NS</td>
</tr>
</tbody>
</table>

Figure 20

MIVAT for papillary carcinoma

- Prospective study
- Effectiveness MIVAT papillary carcinoma debated
- Evaluate completeness 131-I uptake
- Serum thyroglobulin

Figure 21

Figure 22

MIVAT Multiinstitutional Experience

- 4 tertiary referral centres
- 336 patients 279F 57M
- <15ml volume
- Nodules not exceed 3.5cm
- Absence thyroiditis
- Previous neck surgery
- Previous irradiation

Cosmetic result VRS & NS favour MIVAT p=0.003 p=0.01
- 1 RLN palsy & 1 transient hypocalcemia CT
- 2 transient RLN palsy

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What is the Evidence Base for Video Assisted Endoscopic Surgery for Thyroidectomy and Parathyroidectomy

Figure 23

- Mean op time 69.4±30.6mins lobectomy (20-150), 87.4±43.5mins total thyroidectomy (30-220)
- Mean postop stay 1.9±0.8
- 7 transient RLN
- 1 RLN
- 11 hypoparathyroidism (9 transient, 2 definitive)
- Conversion open 15(4.5%)

Figure 24

Preoperative Diagnosis

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Count</th>
</tr>
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<tbody>
<tr>
<td>Toxic Adenoma</td>
<td>22</td>
</tr>
<tr>
<td>Papillary Cancer</td>
<td>64</td>
</tr>
<tr>
<td>Follicular Adenoma</td>
<td>161</td>
</tr>
<tr>
<td>Graves Disease</td>
<td>2</td>
</tr>
<tr>
<td>Hurthle Cells Nodule</td>
<td>36</td>
</tr>
<tr>
<td>Goitre</td>
<td>51</td>
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</table>

Figure 25

MIVAT Operative Complications

<table>
<thead>
<tr>
<th>Complication</th>
<th>Count (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemorrhage</td>
<td>3 (0.9%)</td>
</tr>
<tr>
<td>Wound sepsis</td>
<td>1 (0.3%)</td>
</tr>
<tr>
<td>RLN palsy</td>
<td></td>
</tr>
<tr>
<td>Transthyroid</td>
<td>7 (2.1%)</td>
</tr>
<tr>
<td>Permanent</td>
<td>1 (0.3%)</td>
</tr>
<tr>
<td>Transient hypocalcemia</td>
<td>9 (2.67%)</td>
</tr>
<tr>
<td>Permanent hypoparathyroidism</td>
<td>2 (0.6%)</td>
</tr>
</tbody>
</table>

Figure 26

MIVAT reasons for conversion

<table>
<thead>
<tr>
<th>Reason</th>
<th>Count (%)</th>
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</thead>
<tbody>
<tr>
<td>Haemorrhage</td>
<td>2 (0.6%)</td>
</tr>
<tr>
<td>Difficult dissection</td>
<td>10 (2.9%)</td>
</tr>
<tr>
<td>Completion thyroidectomy</td>
<td>2 (0.6%)</td>
</tr>
<tr>
<td>Oesophageal infiltration</td>
<td>1 (0.3%)</td>
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</tbody>
</table>

Figure 27

Different Authors Performing Endoscopic Thyroidectomy

<table>
<thead>
<tr>
<th>Author</th>
<th>Cohort</th>
<th>No.</th>
<th>Age</th>
<th>Surgery</th>
<th>OT time</th>
<th>Size mm</th>
<th>Conversion</th>
<th>Complication</th>
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<tbody>
<tr>
<td>Gagner</td>
<td>Y</td>
<td>L8</td>
<td>43</td>
<td>HT</td>
<td>220</td>
<td>(7-20)</td>
<td>2</td>
<td>0</td>
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<tr>
<td>Villers</td>
<td>Y</td>
<td>20</td>
<td>(17-62)</td>
<td>HT</td>
<td>180</td>
<td>(18-90)</td>
<td>0</td>
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<tr>
<td>Panke</td>
<td>Y</td>
<td>L24</td>
<td>(7-65)</td>
<td>HT</td>
<td>57</td>
<td>(90-240)</td>
<td>5</td>
<td>6</td>
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<tr>
<td>Takami</td>
<td>Y</td>
<td>74</td>
<td>-</td>
<td>HT</td>
<td>180</td>
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<td>3</td>
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<tr>
<td>Miccoli</td>
<td>N</td>
<td>L41</td>
<td>39</td>
<td>HT</td>
<td>50</td>
<td>(35-120)</td>
<td>3</td>
<td>9</td>
</tr>
</tbody>
</table>

Figure 28

A different table or figure related to endoscopic thyroidectomy.
What is the Evidence Base for Video Assisted Endoscopic Surgery for Thyroidectomy and Parathyroidectomy

Figure 29

Conclusion

- Limited indications
- Not widespread
- Learning curve
- Expense
- Cosmesis
- Pain

Figure 30

References

Author Information

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