Minimally Invasive Parathyroidectomy and Thyroidectomy: *Don’t believe the hype*

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Grand Rounds Resident Debate
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Definition of *hype*:

1. Excessive publicity and the ensuing commotion
2. Exaggerated or extravagant claims made especially in advertising or promotional material
3. An advertising or promotional ploy
4. Something deliberately misleading; a deception

*American Heritage Dictionary of the English Language*
Quan Yang Duh, *Surgery*, Dec 2003
Parathyroidectomy

- **Primary hyperparathyroidism (pHPT)**
  - Single adenoma > 92%
  - Full 4 gland exploration needed in 8%

- **1920-30s: 4 gland examination**
  - Full dissection
  - Larger glands abnormal
  - Smaller glands normal

**Gross anatomy**
Parathyroidectomy

- Frozen section: compare biopsies

Microscopic anatomy

- Late 1980s: Sestamibi scan
  - Tc\textsuperscript{99} – labeled protein
  - Mitochondrial membrane
  - Physiologically active gland
  
  becomes radioactive

Physiology
Parathyroidectomy

- 1990s: rapid PTH assay
  - 50% decrease in serum PTH

Physiology

- Late 1990s: minimally invasive operation
  - Smaller, more directed operations
  - Less dissection → smaller incisions
  - Minimal anesthesia
  - Quicker postoperative discharge
Minimally Invasive Video-Assisted Parathyroidectomy Versus Open Minimally Invasive Parathyroidectomy for a Solitary Parathyroid Adenoma: A Prospective, Randomized, Blinded Trial

Marcin Barczyński, MD, PhD, Stanisław Cichoń, MD, PhD, Aleksander Konturek, MD, PhD, Wojciech Cichoń, MD

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- 84 consecutive pHPT patients
- 60 single adenoma: US & Tc$^{99}$-MIBI
- MIVAP vs. OMIP, randomized n=30 each
- GETA with intraoperative iPTH
- Caregivers and patients blinded
- $1^o$ end points:
  - pHPT
  - Hypocalcemia

All patients were cured
• 2° end points: MIVAP vs. OMIP
  – OR time: similar, ave. 42min vs. 49min ($p=0.22$)
  – scar length: ave. 17.2mm vs. 30.8mm ($p<0.001$)
  – pain intensity: 4hr: 25 vs. 32, 8hr: 26 vs.32, 12hr: 20 vs. 25, 24hr: 16 vs. 20 ($p<0.001$)
  – analgesia request rate: 63% vs. 90% ($p=0.01$)
  – analgesia consumption rate: 52mg vs. 121mg of ketoprofen ($p<0.001$)
  – cosmetic satisfaction: 1 month: 85% vs. 75% ($p=0.006$), 6 months: No difference
  – cost: $1,150 vs. 1,015 ($p<0.001$) $$$$$$
Video-assisted versus conventional parathyroidectomy in primary hyperparathyroidism: A prospective randomized study

Paolo Miccoli, MD, Cino Bendinelli, MD, Piero Berti, MD, Edda Vignali, MD, Aldo Pinchera, MD, and Claudio Marcocci, MD, Pisa, Italy

Surgery 1999;126

• Prospective & randomized, NOT blinded
• 47 pHPT patients eligible for MIVAP
  – Sporadic pHPT
  – Preoperative US suggesting adenoma
• 18 pts 4 gland exploration, 20 pts MIVAP
• MIVAP cosmetic result “significantly” better
• Questionnaire: 1, 3, & 6 months post op
  – 1 (poor) through 10 (excellent)
Comparison between minimally invasive video-assisted thyroidectomy and conventional thyroidectomy: A prospective randomized study

Paolo Miccoli, MD, Piero Berti, MD, Marco Raffaelli, MD, Gabriele Materazzi, MD, Silvia Baldacci, BS, and Giuseppe Rossi, PhD, Pisa, Italy

Surgery 2001;130

- Prospective & randomized, NOT blinded
- 49 patients with a thyroid nodule or “low risk” papillary carcinoma
- 24 conventional thyroidectomy, 25 MIVAT
• Cosmetic result: one month postop
  – Written scale: 1 (poor) through 10 (excellent)
    CT 8.0 vs. MIVAT 9.2 ($p=0.003$)
  – Verbal scale: 1, poor; 2, acceptable; 3, good; 4, excellent
    CT 3.1 vs. MIVAT 3.8 ($p=0.01$)

• MIVAT increased cost: no details
“The true effectiveness of MAP and MAT in improving postoperative scar cosmesis compared with conventional techniques has yet to be fully elucidated because the use of validated scar assessment tools and patient satisfaction scales have not been applied in a systematic manner to these patients.”
Objective and Subjective Scar Aesthetics in Minimal Access vs Conventional Access Parathyroidectomy and Thyroidectomy Surgical Procedures

A Paired Cohort Study

Daniel A. O’Connell, MD, MSc; Christopher Diamond, MD; Hadi Seikaly, MD, FRCSC; Jeffrey R. Harris, MD, FRCSC

- Prospectively enrolled 11 MAP patients
- Sex/age matched retrospective cohort CAT/P
- 8 months postop: valid assessment
  - Vancouver Scar Scale
  - Observer Scar Assessment Scale
  - Patient Scar Assessment Scale
  - Likert scale (satisfaction)
Vancouver Scar Scale (VSS)

Observer Scar Assessment Scale (OSAS)

Patient Scare Assessment Scale (PSAS)

Figure 1. The Patient and Observer Scar Assessment Scale.
Minimally invasive procedures have limited quality of life benefit.

Table 2. Patient and Observer Scar Assessment Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>MA-P Group</th>
<th>CON-P and CON-T (Combined) Group</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scar length, mm</td>
<td>33.6 (5.2) (34, 23-35)</td>
<td>75.8 (9.3) (75, 57-89)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>VSS score</td>
<td>2.6 (1.6) (2, 0-6)</td>
<td>2.5 (1.6) (2, 1-5)</td>
<td>.76</td>
</tr>
<tr>
<td>POSAS score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSAS</td>
<td>10.1 (4.0) (9, 5-19)</td>
<td>9.9 (2.6) (10, 6-13)</td>
<td>.79</td>
</tr>
<tr>
<td>PSAS</td>
<td>9.1 (2.9) (9, 6-15)</td>
<td>7.4 (1.9) (7, 6-12)</td>
<td>.14</td>
</tr>
<tr>
<td>Objective scar rating</td>
<td>2.2 (0.9) (2, 1-4)</td>
<td>2.6 (1.0) (2, 1-4)</td>
<td>.35</td>
</tr>
<tr>
<td>Overall patient satisfaction</td>
<td>2.1 (1.2) (2, 1-5)</td>
<td>1.1 (0.3) (1, 1-2)</td>
<td>.008</td>
</tr>
</tbody>
</table>
MIVAP & MIVAT are all *hype*

- Long-term outcomes are the same
- Better cosmetic results are not proven and do not justify higher costs
- Currently remains a marketing ploy