Mini-invasive treatments for thyroid lesions?
"Take home messages"

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Odense, Denmark
Mini-invasive treatments for thyroid lesions
Bari, Italy, 7-10 November 2013
Who are our experts?

- Ethanol ablation (PEI)
- Laser ablation (ILP)
- Radiofrequency ablation (RFA)
- Rinaldo Guglielmi
- Roberto Valcavi
- Maurilio Deandrea
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Fiat Topolino  Maserati Quattroporte  Ferrari California
How do we evaluate cost-effectiveness?
How do we evaluate cost-effectiveness?

And quality of life?
With my age, can I embrace modern technology?
Thyroid nodule(s)

- History
- Palpation
- TSH
- Diagnostic
- Imaging

Strong suspicion of malignancy

Surgery

No treatment

Surgery

L-T4

PEI, ILP, RFA

FNAB

Diagnostic

Malignant

Suspicious

Benign

Surgery

Repeat FNAB (US-guidance)

Nondiagnostic

Scintigraphy

Hot nodule

TSH ↓

No treatment

Radioiodine

PEI, ILP, RFA

What are you talking about!? Just lay that egg! No! I want a cheap, long-lasting epidural!

Limited destruction with PEI, ILP, and RFA

No transplacental passage or into breast milk

Hvad taler du om!? Læg nu bare de æg!

Nej! Jeg vil have en epidural!
Indications for non-surgical thyroid nodule therapy
Phenotypes accessible?

- Solitary scintigraphically cold/non-functioning thyroid nodules
  - Solid
  - Cystic
  - Mixed solid/cystic

- Solitary scintigraphically warm/hot functioning thyroid nodules
  - Solid
  - Mixed solid/cystic

- Multinodular goiter?

- Thyroid cancer?

- Metastases to thyroid lymph nodes from thyroid cancer?
Indications for non-surgical thyroid nodule therapy
Phenotypes accessible for PEI

- Solitary scintigraphically cold/non-functioning thyroid nodules
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Advantages and disadvantages of ethanol ablation (PEI) in thyroid nodules

Cold, solid non-functioning benign nodules

Advantages

- Outpatient therapy
- 50% reduction of nodule size
- Up to 75% with repeat therapy
- No radiation hazard
- No surgical or anaesthesiol. risk
- No permanent hypothyroidism
- Efficacy far higher than LT4
- Low cost, rapido
# Advantages and disadvantages of ethanol ablation (PEI) in thyroid nodules

**Cold, solid non-functioning benign nodules**

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
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<tbody>
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<td>• Outpatient therapy</td>
<td>• Recurrence rate high (≥50%)</td>
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<td>• 50% reduction of nodule size</td>
<td>• ”Mild” side-effects (5-10%)</td>
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<td>• Up to 75% with repeat therapy</td>
<td>• Pain the rule</td>
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<td>• No radiation hazard</td>
<td>• Rare, grave side-effects</td>
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<td>• No reduction of extranodular size</td>
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<td>• No permanent hypothyroidism</td>
<td>• No histology</td>
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<td>• Efficacy far higher than LT4</td>
<td>• May impeede subsequent surgery</td>
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<td>• Low cost</td>
<td>• No compar. with surg., ILP or RFA</td>
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- Quality of life improvement?
Advantages and disadvantages of ethanol ablation (PEI) in thyroid nodules

Warm/hot solid functioning benign nodules

Advantages

- Outpatient therapy
- 30-40% reduction of nodule size
- Up to 70% with repeat therapy
- No radiation hazard
- No surgical or anaesthesia risk
- Permanent hypothyroidism rare
- Low cost, rapido
Advantages and disadvantages of ethanol ablation (PEI) in thyroid nodules

Warm/hot solid functioning benign nodules

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Advantages and disadvantages of ethanol ablation (PEI) in thyroid nodules

Cold, cystic non-functioning benign nodules

Advantages

- Outpatient therapy
- Remission-rate ≥80%
- Pain rare
- No radiation hazard
- No surgical or anaesthesia risk
- No permanent hypothyroidism
- Low cost and rapido
Advantages and disadvantages of ethanol ablation in thyroid nodules
Cold, cystic non-functioning benign nodules

Advantages

- Outpatient therapy
- Remission-rate $\geq 80\%$
- Pain rare
- No radiation hazard
- No surgical or anaestesiol. risk
- No permanent hypothyroidism
- Low cost and rapido

Disadvantages

- Recurrence rate around 20\%
- "Mild" side-effects (5-10\%)
- Rarely grave side-effects
- No reduction of extra-cystic size
- No histology
- May impede subsequent surgery
- No comparison with surg., ILP or RFA
- Quality of life improved?
Non-surgical thyroid nodule management
Ethanol (PEI) ablation

Conclusions

• Used since the early 1990s. Low cost
• Available data in functioning and non-functioning solid benign thyroid nodules
• Shrinkage of ca. 50% with one and up to >70% with repeated sessions
• Many side-effects related to pain and extra-thyroidal seepage of ethanol. L.a. suffices
• Best evidence of efficacy and limited side-effects for cystic nodules
• Randomized studies and head-to-head comparisons with ILP, RFA, and surgery not available
• At large replaced by other US-guided interventional techniques
• Long-term efficacy hampered by recurrence
• Should only be performed by individuals skilled in interventional US
• Treatment of thyroid cancer or metastatic lymph nodes - experimental
Non-surgical thyroid nodule management
Interstitial laser photocoagulation (ILP)

Conclusions

• Used since the early 2000s. More expensive than PEI
• Available data in functioning and non-functioning solid benign thyroid nodules
• Shrinkage of ca. 50% with one and up to >70% with repeated sessions
• Few side-effects related to pain and no extra-thyroidal effect. L.a. suffices
• Best evidence of efficacy and limited side-effects for solid nodules
• Randomized studies and head-to-head comparisons with PEI, RFA, and surgery very scarce
• Has at large replaced PEI as US-guided interventional technique of preference
• Long-term efficacy and recurrence rate remain to be defined
• Should only be performed by individuals skilled in interventional US
• Treatment of thyroid cancer or metastatic lymph nodes - experimental
Non-surgical thyroid nodule management
Radiofrequency ablation (RFA)

Conclusions

- Used since the early 2000s. More expensive than PEI and ILP
- Available data in functioning and non-functioning solid benign thyroid nodules
- Shrinkage of ca. 50% with one and up to >70% with repeated sessions
- Fewer side-effects related to pain and no extra-thyroidal destruction. Necessitates conscious sedation
- Best evidence of efficacy and limited side-effects for solid cold nodules
- Randomized studies and head-to-head comparisons with PEI, ILP, and surgery very scarce
- Only available in few centres
- Long-term efficacy remains to be proven. Recurrence rate unestablished
- Should only be performed by individuals skilled in interventional US
- Treatment of thyroid cancer or metastatic lymph nodes - experimental
Many opinions and mounting evidence regarding non-surgical therapy of nodular thyroid disease
Many opinions and mounting evidence regarding non-surgical therapy of nodular thyroid disease

- Is current focus on fascination of the technologies (too many choices)?
- Suggest focus on eligibility, cost-effectiveness, quality of life - individualized
- Head-on comparisons between techniques, including that of surgery
- Define ”window of opportunity” for PEI, ILP, RFA, and other techniques
Mini-invasive treatments for thyroid lesions
Take home messages

Modern times are here to stay
Mini-invasive treatments for thyroid lesions
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Suggest that you do not turn your back on them