Recurrent & Persistent Papillary Thyroid Cancer
Central Nodal Dissection vs. Node-Picking Patterns of Nodal Metastases
Recurrent Laryngeal Nerve, Larynx, Trachea, & Esophageal Management
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Recurrent & Persistent Papillary Thyroid Ca
Low cancer mortality

More initially .... Less recurrence
+ more complications

Less initially .. More recurrence .. recurrence

$\text{I}^{131}$

TSH suppression
T Staging

- **TX**: Primary tumor cannot be assessed
- **T0**: No evidence of primary tumor
- **T1**: Primary tumor diameter $\leq 2$ cm
- **T2**: Primary tumor diameter $> 2$ cm but $\leq 4$ cm
- **T3**: Primary tumor $> 4$ cm
- **T4a**: Tumor of any size extending beyond the thyroid capsule to invade subcutaneous fat, larynx, trachea, esophagus, or recurrent laryngeal nerve
- **T4b**: Tumor invades prevertebral fascia, or encases carotid artery or mediastinal vessels
N Staging

- NX: Regional lymph nodes cannot be assessed
- N0: No regional lymph node metastasis
- N1a: Metastases to Level VI (paratracheal, pretracheal, prelaryngeal/Delphian nodes)
- N1b: Metastasis in unilateral, bilateral, or contralateral lateral cervical or mediastinal nodes
Recurrent & Persistent Papillary Thyroid Ca

- Locoregional recurrence is the most challenging problem in thyroid papillary ca
- Extent of thyroidectomy: in 900 ≤ 1cm PTC over 60 years (Hay ID et al, 2008), 23% multifocal, 12% bilateral, with recurrence (20 yr) 5.5% for bilateral vs. 9.8% for unilateral surgery (NS), in contralateral lobe or soft tissues
Recurrent & Persistent Papillary Thyroid Ca

- 52,173 PTC database study (Bilimoria et al, 2007):
  - < 1 cm, no difference between lobectomy or total thyroidectomy
  - 1-1.9 cm, 24% more recurrence, 49% more cancer mortality in lobectomy vs. total thyroidectomy
  - > 1 cm, 15% more recurrence, 31% more cancer mortality
Recurrent & Persistent Papillary Thyroid Ca

- 33,088 DTC pts had 46% greater cancer-specific deaths in > age 45 group w/ nodal mets vs. without (Zaydfudin V et al, 2008)
- Number of positive nodes correlates w/ recurrence and DM (Leboulleux S et al, 2005)
- Preop ultrasound sensitivity low (<50%) due to inability to show micrometastases (Ito Y et al, 2006)
Compartmental prophylactic nodal dissections may reduce recurrence (Scheumann GF et al, 1994; Bonnet S et al, 2009) but may increase risk of injury to RLN and parathyroid glands.

Liberal use of auto-transplantation esp. in secondary central dissections (Clayman G et al, 2009)
Recurrent & Persistent Papillary Thyroid Ca

- Differences from nodal patterns with SCCa
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- Medial to carotid sheath, retro-tracheal
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- Deep to carotid sheath
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- Structures at risk in dissecting medial and deep to carotid sheath
  - Internal and external branches of superior laryngeal n.
  - Superior thyroid artery (superior PTH supply)
  - Vagus n.
  - Sympathetic plexus
  - Thoracic duct
  - Phrenic n.
  - Pleura
Recurrent & Persistent Papillary Thyroid Ca

- Massive neck metastasis, nodal mets in superficial inferior midline adipose tissue
Recurrent & Persistent Papillary Thyroid Ca

- Massive neck metastasis
Recurrent & Persistent Papillary Thyroid Ca

- 50-75% papillary ca are $^{131}$I avid, decreases with age
- RAI for <10 mm tumors, efficacy in reducing recurrences questioned (Hay ID et al, 2008)
- 115 pts < 2 cm ca, 37% central, 23% lateral occult nodal metastasis (Bonnet S et al, 2009)
Recurrent & Persistent Papillary Thyroid Ca

- Level II-B not involved unless II-A grossly positive, V-A never involved, in 53 (43 recurrent) clinically obvious lateral neck disease (Farrag T et al, 2009)
- Ultrasound accurate for detecting nodal recurrences: 90% sensitive, 78% specific, 94% positive predictive value (Stulak JM et al, 2006)
Central Nodal Dissection vs. Node-Picking

- Retrospective review of last 50 patients with thyroid cancer w/o clinical nodal mets
- 45 women 5 men
- Average age 50
- Node-picking 23 (2003-2006)
- Central dissection 27 (2006-2009)
## Overall Yield of Positive Nodes

<table>
<thead>
<tr>
<th>Method</th>
<th>Total</th>
<th>Positive nodes (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Node-picking</td>
<td>23</td>
<td>7 (30%)</td>
</tr>
<tr>
<td>Central Dissection</td>
<td>27</td>
<td>18 (67%)</td>
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</table>

P<.05
### <1cm Cancers
Yield of Positive Nodes

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>% with positive nodes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Node-picking</td>
<td>12</td>
<td>2 (17%)</td>
</tr>
<tr>
<td>Central Dissection</td>
<td>7</td>
<td>4 (57%)</td>
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</table>

P < .05
### >1cm Cancers

#### Yield of Positive Nodes

<table>
<thead>
<tr>
<th>Method</th>
<th>Total</th>
<th>% with positive nodes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Node-Picking</td>
<td>11</td>
<td>5 (45%)</td>
</tr>
<tr>
<td>Central Dissection</td>
<td>20</td>
<td>14 (70%)</td>
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</table>

P<.05
## Number of Positive Nodes

<table>
<thead>
<tr>
<th>Method</th>
<th>Overall p=.002</th>
<th>&lt;1cm p=.05</th>
<th>≥1cm p=.007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Node-Picking</td>
<td>1.7</td>
<td>2.0</td>
<td>1.6</td>
</tr>
<tr>
<td>Central Dissxn</td>
<td>4.6</td>
<td>3.8</td>
<td>4.8</td>
</tr>
</tbody>
</table>
6 month non-stimulated Thyroglobulin levels, excluding T4 and known DM

- Node picking: 80% undetectable
- Nodal dissection: 100% undetectable
Delphian Node Predictive Value

- Positive Predictive Value for Central node involvement 7/7 (100%)
- Negative Predictive Value 18/26 (69%)
Recurrent Laryngeal Nerve Surgical Management

- Resection of RLN may worsen hoarseness & aspiration despite preop fixed cord due to loss of remaining innervation.
- Resection of anterior branch of RLN causes fixation of cord, but relatively good voice without aspiration.
Recurrent Laryngeal Nerve Surgical Management

- Shave of RLN for margins may result in no noticeable loss of function
- Extrapolating from facial n, stretch injury of < 10% is significant, as is crush or electrical trauma
Recurrent Laryngeal Nerve Surgical Management

- Immediate vs. delayed arytenoid adduction or thyroplasty
- Interposition nerve grafting
- Isolate RLN high as it enters larynx in thyroidectomy w/o preop cancer diagnosis to facilitate secondary central nodal dissection
Papillary Ca Invading Thyroid Cartilage and Cricothyroid Membrane
Papillary Ca Invading Thyroid Cartilage and Cricothyroid Membrane
Papillary Ca Invading Thyroid Cartilage and Cricothyroid Membrane
Papillary Ca Invading Membranous Trachea and Esophagus

Allograft to repair trachea
Papillary Ca Invading Trachea

Segmental resection & end to end anastomosis
Residual Papillary Ca Invading Esophagus

-Hypopharynx & upper esophagus involved to superior mediastinum
-Lateral matted nodal mets
-IJV compressed/occluded
-Morbidly obese
Residual Papillary Ca Invading Esophagus

- RLN resected at entry into larynx
- Esophageal wall bulging after muscularis resection
- On regular diet
- Still morbidly obese
Neck Incision for Thyroidectomy and Modified RND
Robotic assisted thyroidectomy

- Transaxillary approach
- No neck incisions
- Cannot perform superior mediastinal dissection or pyramidal lobe resection to hyoid bone
- Lateral neck dissection possible
References