Lymph node dissection for differentiated thyroid cancer

How to avoid complications?

Michel Mourad MD, PhD
Surgery and Abdominal Transplantation Division
Cliniques universitaires Saint-Luc
Brussels
Papillary Thyroid Carcinoma

The most common thyroid malignancy
Increasing incidence (screening by US)
80% of all thyroid cancers
High disease-specific survival rates
Frequently associated with Lymph node invasion:
  - High risk for local recurrence
  - survival

Compartment-oriented neck dissection is recommended

Zaydfudim V et al. Surgery 2008; 144: 1070-1077
Aims of surgery:

- Eradicate the primary tumor
- Reduce local, distant recurrence
- Facilitate postoperative treatment with $^{131}$I
- Permit accurate staging and risk stratification
- Minimal morbidity

Adequate surgery is an important variable influencing prognosis
Lymph node management

Berry picking

- Early Recurrence

Sentinel node biopsy

- Promising technique
  Low level of evidence

Radical dissection

- Vascular
- Muscular Invasion

Modified Radical Node Dissection

- Lateral compartment
- Nodal metastasis
Modified Radical Neck Dissection

Preserves

Jugular Veine
Sternocleidomastoid muscle
Accessory nerve

Conserves

Function
Cosmesis
Lymph node management

Central Compartment Node Dissection (CCND)
Lateral Compartment Node Dissection (MRND)

How to do it?
When to do it?
Central compartment

Between carotid arteries
Prelaryngeal space
Upper horn of the thymus
(Innominate veine)
Central compartment: Level VI
Skin incision

As small as possible
As big as necessary
Lymph nodes present in front of and behind the RLN
Lymph nodes present only in front of the RLN
Central Compartment Neck Dissection

Vocal corde paralysis

Transient 2-13 %
Permanent 2-3%

Neuromonitoring
Direct / continuous registration

Hypoparathyroidism

Transient 3-52 %
Permanent 0.4-13 %

Knowledge of anatomy
Superior “Treat like gold”
Capsular ligation of branches ITA
Autotransplantation (SCM/forearm)
Parathyroid vascular anatomy
Central Cervical Nodes Dissection (level VI)

When?

• No controversy regarding the value of therapeutic CCND

• Prophylactic CCND:
  Proponents
  Opponents
TT with/without prophylactic CCND:
Recurrence-free survival

**Benefit in terms of recurrence-free survival**

- Popadich A et al. *Surgery* 2011; 150: 1048-1057
- Lang BH et al. *Thyroid* 2013; 23: 1087-1098

**No difference in recurrence rates**

- Raffaelli M et al. *Surgery* 2012; 152:957-964

Low level of evidence
Identify pN0 population
TT with/without prophylactic CCND: Postoperative thyroglobulin

TT associated to prophylactic CCND increases Nbr of patients with undetectable TG

Popadich A et al. Surgery 2011; 150: 1048-1057
So YK et al. Surgery 2012; 151: 192-198

No difference in thyroglobulin levels between pCCND and no pCCND


Low level of evidence
TT with/without prophylactic CCND: Accurate staging

Prophylactic CCND upstages 30 to 50% of patients from cN0 to pN1

Cooper DS et al. Thyroid 2009; 19: 1167-1214

Predictive factors of recurrence

- Size
- Number
- Location
- Extracapsular spread
- Micrometastases are included

Debatable issue
TT with/without prophylactic CCND: Morbidity

Prophylactic CCND does not carry a higher risk of permanent nerve paralysis or hypoparathyroidism

- Popadich A et al. *Surgery* 2011; 150: 1048-1057

Higher prevalence of permanent hypoparathyroidism


Not always reported

Reduce the need for reoperation (greater morbidity)
# Prophylactic Central Cervical Nodes Dissection

<table>
<thead>
<tr>
<th>Association/Medical Society</th>
<th>T1 or T2</th>
<th>T3 or T4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>American Thyroid Association (2009)</strong> Cooper DS, et al. Thyroid 2009; 19: 1167</td>
<td>Not recommended</td>
<td>Recommended</td>
</tr>
</tbody>
</table>

If: >45ys, <15ys, male, bilat, multifocal, Known lateral LN
Conclusions: Central Cervical Nodes Dissection (level VI)

No controversy regarding the value of therapeutic CCND

Prophylactic CCND remains controversial
Prospective studies are needed

Long-term follow-up
Rigorous inclusion criteria
Population homogeneity

Not easy to perform
Lateral compartment

Anteriorly: Fascia of SCM
Laterally: Fascia of SCM
Posteriorly: Scalenus muscles
Superiorly: Digastric muscle
Inferiorly: Behind clavicule
Lymph node levels

Ia, Ib

IIa, IIb

III

IVA, IVb

Thoracic duct
Left venous angle
Right venous angle
Left brachiocephalic vein
Upper limit of lateral dissection

Levels IIa, IIb
Inferior and posterior limits

Levels IV and V

Phrenic nerve

Transverse cervical a.
Cliniques universitaires Saint-Luc – M Mourad

- Digastric m.
- Hypoglossal n.
- Lingual a.
Lateral compartment related complications

**Sympathetic trunk**
- Horner syndrome

**Vagus nerve**
- Vocal corde palsy

**Thoracic duct (left)**
- Chylorrhea

**Lymphatic trunk (right)**
- Diaphragm mvt

**Phrenic nerve**
Submaxillary Node Dissection (Levels I, II)

**Accessory nerve**
- Drop shoulder and pain

**Hypoglosse nerve**
- Tongue deviation and atrophy

**Mandibular ramus**
- (facial nerve)
- Asymmetric smile
Modified Radical Neck Dissection

Routine application of MRND in lateral node-negative patients remains an open question

Europe and USA: not used very often

In Japan: popular and widely performed recommended (2 or more criterias)

Male gender
Age >55 years
Tumor size >3cm
Massive extrathyroid extension
Conclusions

No controversy about the necessity to remove all clinically apparent nodal disease via a compartment-oriented approach

Indications for prophylactic central neck dissection are controversial

Central or lateral neck dissection may be associated with significant morbidity

Lymph node dissection should be performed in relation to available surgical expertise