Surgery for Recurrent Thyroid cancer: Considerations and limitations

2016 Thyroid Master Class
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• NO

Disclosures
Objectives

- Understand the availability and helpfulness of the ATAA guidelines.
- Understand the extent and approach to re-operative central neck dissection
- Understand the extent and approach to re-operative lateral neck dissection
- Understand the role of intra-operative nerve monitoring and ultrasound
- Understand considerations if Local invasion of Trachea or other structures
Controversies

- Extent of first surgery
- When to operate on recurrent/residual disease
- Role of intraoperative nerve monitoring
- Reoperation and role of ultrasound
- Should we resect larynx or trachea or esophagus
American Thyroid Association Guidelines 2015

- Collaboration between
  - Endocrinologist
  - Radiologist
  - Surgeon

- Patient
- Disease
Summary: The most commonly involved central lymph nodes in thyroid carcinoma are the prelaryngeal (Delphian), pretracheal, and the right and left paratracheal nodal basins. A central neck dissection includes comprehensive, compartment-oriented removal of the prelaryngeal and pretracheal nodes and at least one paratracheal lymph node basin. A designation should be made as to whether a unilateral or bilateral dissection is performed and on which side (left or right) in unilateral cases. Lymph node “plucking” or “berry picking” implies removal only of the clinically involved nodes rather than a complete nodal group within the compartment and is not recommended. A therapeutic central compartment neck dissection implies that nodal metastasis is apparent clinically (preoperatively or intraoperatively) or by imaging (clinically N1a). A prophylactic/elective central compartment dissection implies nodal metastasis is not detected clinically or by imaging (clinically N0).

Conclusion: Central neck dissection at a minimum should consist of removal of the prelaryngeal, pretracheal, and paratracheal lymph nodes. The description of a central neck dissection should include both the indication (therapeutic vs. prophylactic/elective) and the extent of the dissection (unilateral or bilateral).
Outline

- Extent of primary surgery
- Pre op preparation for second surgery
- Extent of surgery
  - Lateral
  - Central
  - Lateral and central Both
  - Recurrent laryngeal nerve
  - Parathyroids
- Imaging
- Monitoring
- Molecular testing
**Extent of Central neck and lateral neck dissection**

- Based on clinical / intraoperative diagnosis –
  - Recommend selective neck dissection
  - Preserves jugular vein, spinal accessory nerve, and sternocleidomastoid muscle
  - Recurrent laryngeal nerve

- Papillary Medullary
Quality and Standards neck dissection

Number of lymph nodes
• Recurrent laryngeal nerve injury
• Hypocalcemia
• Voice and swallowing changes

Definition of dissection
• Limited removal only pathologically positive LN (ave 2.6 Pos LN)
• Neck dissection more positive nodes than negative (ave 5.3 /14 LN)
• Bhattacharyya, N Surgical treatment of Cervical Nodal mets in pts with papillary thyroid cancer Arch Otolaryngology HNS 2003; 129:1101-1104.
Yield of Neck dissection

- Functional neck dissections recover approx 16 nodes per dissected side
- Supraomohyoid neck dissections recover approximately 10 nodes per side.

Bhattacharyya N, The effects of more conservative neck dissection and radiation therapy on nodal yields from neck, Arch oto hns 1998;124:412-416
What Type of Lateral Neck dissection - Selective

- Suarez – 1963
  - “Cervical lymph nodes are contained in spaces bound by muscles and vessels but not directly attached to these structures”
  - “Invasion of muscles or vessels occurs only after the capsule of the lymph node has been violated by cancer”
Lateral Neck Approaches

- **Incisions**
  - McFee
  - Hockey stick

- **Considerations**
  - Anatomy
  - Volume disease
  - Aesthetics
  - Cosmesis

- **Lymphedema**

Mets what do they look like -
What this is all about!
Extension of neck dissection: The Internal Jugular Vein - Follicular cancer invading internal jugular vein
Compression of the internal jugular vein from PTC node
Level V - Sub-Groups –

- Level 5a: Nodes above the plane formed by the inferior border of the cricoid:
  - Spinal accessory chain nodes

- Level 5b: Nodes below this level
  - Transverse cervical chain and supraclavicular nodes
Level V and trans cervical and Levels III and IV
Dissection over IJV
Lateral Neck Challenges

• Level III disease adherent to superior neurovascular pedicle.
• Level IV/ V disease at /below clavicle
• Trapezius dysfunction

Lateral Neck Challenges

❖ Nerves
  • Spinal accessory nerve
  • Phrenic sympathetic trunk

❖ Chyle leak
  • Potentiality
  • Bilateral
  • Left > Right
  • Incidence
  • Management

Lateral Neck Pearls

- **Consider**
  - Not dissecting level V
    - Superior to accessory

- **Consider**
  - Length of incision
  - Monitor nerve/s
  - Ultrasound for yield

Re-operative neck surgery for thyroid cancer

The lateral and central neck nodes

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Thyroglobulin
Palpable mass
Voice or swallowing symptoms

SITUATION
Indications and considerations

- Metastatic lymph nodes in central compartment
- Metastatic lymph nodes in lateral neck
- Soft tissue deposits
- Invasion of trachea/larynx/esophagus
Steps for Surgery

1. Appointment scheduled
2. Records are sent to office and reviewed
3. Cytology/Pathology slides reviewed by pathologist
4. Pre operative counseling as outpatient
5. US imaging in the OR
6. Recurrent nerve monitoring
7. Final Pathology
8. Treatment Plan

"Nurse, get on the internet, go to SURGERY.COM, scroll down and click on the 'Are you totally lost?' icon."
Boundaries of Central Neck

- Superior – Inferior thyroid Artery
- Inferior – Innominate Artery
- Lateral – Carotid Artery

Compartment anatomy allows the superior parathyroid to be out of field of dissection.
Levels of the Neck – so how do you find the lymph node?
Intraoperative ultrasound

- Collaboration with radiologist
- Takes a picture or verbal description and allows live intraop anatomical correlation and localization
- Injection of blue dyes immediately preop w ultrasound guidance.

https://expertconsult.inkling.com/read/ralph-surgery-the-thyroid-parathyroid-glands-2nd/chapter-14/figure-14-4

Localization of Recurrent Thyroid Cancer Using Intraoperative Ultrasound-Guided Dye Injection
Complications of Neck dissection
Editorial Shaha

TABLE 1. Complications of neck dissection for thyroid cancer

<table>
<thead>
<tr>
<th>Central neck dissection</th>
<th>Lateral neck dissection</th>
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<tbody>
<tr>
<td>1) Hypoparathyroidism – temporary/permanent</td>
<td></td>
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<tr>
<td>2) Recurrent laryngeal nerve injury</td>
<td></td>
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<tr>
<td>3) Superior laryngeal nerve injury</td>
<td></td>
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<tr>
<td>1) Hypoparathyroidism – temporary/permanent</td>
<td></td>
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<tr>
<td>2) Chyle leak</td>
<td></td>
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<tr>
<td>3) Hemorrhage</td>
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<td>4) Seroma</td>
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<td>5) Wound infection</td>
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<td>6) Nerve injuries – accessory, ramus mandibularis, sympathetic (Horner’s syndrome), phrenic, brachial plexus, cutaneous cervical plexus</td>
<td></td>
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</tbody>
</table>

Annals Surg Onc, 2007, 15 (2) 397-399
IS CENTRAL NECK DISSECTION NECESSARY FOR THE TREATMENT OF LATERAL CERVICAL NODAL RECURRENCE OF PAPILLARY THYROID CARCINOMA?

❖ Results. All patients had lateral compartment involvement,
❖ 91% at mid-lower, 45% at upper, and 18% at posterior sites.
❖ Central nodes were involved in 86% of patients:
   • 82% at ipsilateral paratracheal, 32% at pretracheal, 27% at superior mediastinal,
   • 2 patients at contralateral sites.
❖ Skip lateral recurrence with no positive central nodes was rarely observed (14%).
❖ Conclusions. The inclusion of comprehensive ipsilateral central and lateral neck dissection in the reoperation optimal
Role of imaging
consider MRI or Ct prior to reoperation
cover high LN
History of thyroid cancer, rising thyroglobulin
Left retropharyngeal lymph node
Central Neck Approaches

- At time of thyroidectomy
- Sample
  - Level VI and VII
  - Delphian lymph node
    - Not easily or often removed in central reoperation
Recurrent Lymph node in central neck

- Ultrasound diagnostic study
- FNA
- Counseling and consenting – uni lateral vs bilateral
- Coordinate surgery
- Recurrent nerve monitoring
- Intra-operative ultrasound
Steps In Central Neck Dissection

- Lateralize or divide straps (inferiorly and reflect superiorly)
- Dissect on superior surface carotid and trachea (if unilateral)
- Retract carotid laterally
- Identify RLN and or vagus
  - Dissect out course of RLN
  - Remove Lymph nodes enbloc, RLN should be dissected
LOWER THYROID (ANT. AND POST. SURFACES) 42%

INTRATHYMIC

THYMIC TONGUE 39%
MEDIAL TINAL 2%

JUXTATHYROIDAL 15%

ECTOPIC 2%
Variability in Course of RLN

- 44% anterior
- 50% in groove
- 5% posterior
- (~1% non-recurrent)
- 80% posterior to art. or between branches
- 20% anterior to art,
Shindo Technique Central Compartment

Generally contents between trachea and carotid,

Nerve dissected retrograde from cricothyroid to below clavicle, innominate, or right carotid.

Lymph node, fat packet dissected off nerve and reflected medially and off trachea, to include pretracheal

Nodes lateral or deep to nerve may be removed separately

Preserve superior parathyroid and try to preserve vascular supply (inf Thyr) of inf PTH

Kim and Park World Journal Of Surgical Oncology
2012:10 164 http://www.wjso.com/content/10/1/164
Paratracheal dissection
Recurrent Laryngeal Nerve Monitoring During Thyroidectomy and Related Cervical Procedures in the Pediatric Population
W. Matthew White, MD; Gregory W. Randolph, MD; Christopher J. Hartnick, MD; Michael J. Cunningham, MD

Recurrent laryngeal nerve monitoring
Complications and morbidity
Central neck dissection

- Primary operation
- Reoperation/secondary
  - Kim M, Weber RS, Morbidity following central compartment reoperation for recurrent or persistent thyroid cancer, Arch OtohNS, 2004, 130:1214-116
  - No RLN paralysis if normal function preop
  - 4/20 with transient hypo calc resolved, 1 preexisting resolved after 3 cent comp dissect
Complications of Neck Dissection
Editorial Commentary: Shaha

- Nodal mets common
- “Failed to show major impact on long-term outcome”
- However nodal mets have impact on elderly

Complications of Neck dissection for Thyroid Cancer

- 74 pts, 115 neck dissections, 23% transient hypocalcemia; 0.9% permanent
  - 60% vs 17% (p<0.005) – neck dissection vs tot thyroid alone
  - Highest incidence 75% - central neck and tot thyr

- 47% second neck dissection, 18% third neck dissection, 5% fourth neck dissection

- No nerve palsies (RLN, CN XII etc)

**Cheah WK, .. Clark, OH Complications of Neck dissection for thyroid cancer World J Surg, 2002. 26; 8:1013-1016,**
Central Neck Pearls

1. Preservation and dissection allowed – RLN, PTH
2. Remember Radioiodoide is very therapeutic and potent for microscopic disease
3. Intraop Ultrasound and preop diagram are much more helpful than anticipated
4. RLN Monitoring

Central Neck Dissection Challenges

- Case of my 1st paratracheal patient
- Recurrent laryngeal nerve invasion
- Tracheal invasion
- Cricoid invasion

- Treatment options
  - Shave
  - Resect window
  - Sleeve resection
  - Laryngo/pharyngeal
Molecular diagnosis beyond FNA cytology

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Ara A. Chalian MD
Thank you for your attention
Thank You

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