Clinical Anatomy of the Thyroid Gland

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Handout download: http://www.oucom.ohiou.edu/dbms-witmer/gs-rpac.htm
Anatomical Overview

- Right & left lobes connected by an isthmus
- Occasional pyramidal lobe
- Levator glandulae thyroideae
- Slightly larger in women; may enlarge during menstruation & pregnancy
- Extends from oblique line on thyroid cartilage down to 4th or 5th tracheal ring
- Attaches to cricoid cartilage via suspensory ligament

From Netter’s Atlas
Case Presentation

A 32-year-old woman presents with a swelling on the anterior part of her neck. She also reports that her breathing is sometimes affected by the swelling. On examination, a single, firm, rounded mass can be felt on the left side of the laryngotracheal region. It moves up and down with swallowing. Ultrasound reveals a solid nodule in the left lobe of her thyroid gland. A needle biopsy subsequently indicates that malignant changes have taken place in the cells.

Preliminary Diagnosis:
Tumor of the left lobe of the thyroid
Questions

1. Why does the mass move up and down on swallowing?

2. What can explain the difficulty breathing?

3. What structures would be endangered by subtotal or total thyroidectomy?

4. Why is the nature of the patient’s voice of interest postoperatively?
Fascia & Spaces

Deep Fascia

1. investing fascia
2. pretracheal fascia
3. prevertebral fascia
4. carotid sheath

sternocleido-mastoid

Moore et al. 2010
Fascia & Spaces

Deep Fascia

1. investing fascia
2. pretracheal fascia
   a. muscular layer
   b. visceral layer
3. prevertebral fascia
4. carotid sheath

thymus gland
trachea & larynx
esophagus

Moore et al. 2010
Fascia & Spaces

pretracheal fascia
thyroid gland
trachea & larynx
esophagus

Moore et al. 2010

**suspensory ligament of Berry**
visceral layer of pretracheal fascia (false capsule)

true capsule
thyroid gland

Skandalakis' Surgical Anatomy 2004
**Fascia & Spaces**

**Deep Fascia**

1. investing fascia
2. pretracheal fascia
3. prevertebral fascia
4. carotid sheath

*common carotid a. (and sympathetic plexus)*
*internal jugular v.*
*vagus n. (and carotid sinus n.)*
*deep cervical lymph nodes*

Moore et al. 2010
Fascia & Spaces

pretracheal fascia

thyroid gland

trachea & larynx

esophagus

prevertebral fascia

carotid sheath

visceral space of Stiles

retropharyngeal (retrovisceral) space

not discussed today:
- suprasternal space of Burns
- “Danger space” of Grodinsky & Holyoke
Strap Muscles

Attachment of sternothyroid to oblique line on thyroid cartilage prevents superior expansion of thyroid

From Netter’s Atlas
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Thyroid CT

Compression and displacement of trachea by thyroid tumor

From web reference 1
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Recurrent Laryngeal N. & Suspensory Lig. of Berry

Variation in recurrent laryngeal nerve position (n = 204)

- 4% intrathyroid
- 42% paratracheal
- 48% tracheoesophageal groove
- 6% paraesophageal

Skandalakis’ Surgical Anatomy 2004
Variation in relationship of recurrent laryngeal n. to inferior thyroid a.

Right:
- 47-50% recurrent laryngeal n.
- 26-33% inferior thyroid a. & branches
- 18-25% recurrent laryngeal n.

Left:
- 50-55% recurrent laryngeal n.
- 33% inferior thyroid a. & branches
- 11-12% recurrent laryngeal n.
Recurrent Laryngeal N. & Suspensory Lig. of Berry

Variation in relationship of recurrent laryngeal n. to suspensory lig.

- Superior thyroid a. & v. (cut)
- Inferior thyroid a. & branches
- Recurrent laryngeal n.
- Thyroid
- Parathyroids
- Suspensory lig. (from Hollinshead 1968)

From Netter’s Atlas (from Hollinshead 1968)
Recurrent Laryngeal N. & Suspensory Lig. of Berry

Variation in relationship of recurrent laryngeal n. to suspensory lig.

superficial to ligament

deep to ligament

passes thru gland

splits around ligament

From Sasou et al. 1998

(from Hollinshead 1968)
A 43-year-old male presents with a swelling in the front of his neck. He first noticed it 9 months ago and it has steadily grown. The lump lies near the midline and moves on swallowing. On palpation, it is firm and lays anterior to the thyroid cartilage. The mass is smooth, non-pulsatile, and non-fluctuant. The dorsum of the tongue was inspected but no thyroid tissue was observed. Ultrasound showed the mass to be cystic and separate from the thyroid gland.

**Preliminary Diagnosis:**
Thyroglossal Cyst
Questions

1. What is the embryonic derivation of a thyroglossal cyst?

2. Why did the mass move upwards on swallowing?

3. Why did the surgeon look for thyroid tissue on the tongue?
Thyroid Development

From Moore & Persaud 2003
From Moore & Persaud 2003
Questions

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Thyroid Development

From Moore & Persaud 2003
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3. Why did the surgeon look for thyroid tissue on the tongue?
Possible Locations of Thyroglossal Duct Cysts

From Moore & Persaud 2003
References

Print

Web
1. Thyroid tumor: http://www.auntminnie.com/ScottWilliamsMD2/nucmed/Tumor/Thallium/Thallium.htm