Clinical Anatomy of the Thyroid and Adrenal Glands

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

28 October 2003

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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?
Cervical Fascia

- pretracheal fascia
- investing fascia
- platysma
- sternohyoid
- sternothyroid
- buccopharyngeal fascia
- alar fascia
- carotid sheath
- prevertebral fascia
- trachea
- thyroid
- parathyroid
- recurrent laryngeal n.

From Netter's Atlas
Strap Muscles

- strap muscles
  - sternohyoid
  - sternothyroid
  - internal jugular v.
  - omohyoid

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

From Netter’s Atlas
Thyroid CT

Compression and displacement of trachea by thyroid tumor

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

Variation in relationship of recurrent laryngeal n. to inferior thyroid a.

(from Hollinshead 1968)
Recurrent Laryngeal N. & Suspensory Lig. of Berry

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

- **superior thyroid a. & v. (cut)**
- **thyroid**
- **inferior thyroid a. & branches**
- **recurrent laryngeal n.**
- **parathyroids**
- **susp. lig.**
- **superficial to ligament**
- **deep to ligament**
- **passes thru gland**
- **splits around ligament**

(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)
Case Presentation

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 lays 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

From Moore & Persaud 2003
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
Ectopic Thyroid Tissue

From Moore & Persaud 2003
Possible Locations of Thyroglossal Duct Cysts

From Moore & Persaud 2003
Adrenal Overview

sympathetic trunk

splanchnic nerves

preganglionic fibers to chromaffin cells in medulla

spinal cord

T10  T11  T12  T13

preaortic ganglia (celiac, aorticorenal)

adrenal cortex — corticosteroids, androgens

adrenal medulla — catecholamines (esp. epinephrine)

From Netter’s Atlas

From Gray’s Atlas
superior adrenal aa. (from inferior phrenic a.)

middle adrenal aa. (from aorta)

inferior adrenal aa. (from renal a.)

inferior phrenic a. inferior phrenic v.

adrenal gland

adrenal v.

left renal v.

IVC (cut)

From Netter’s Atlas
Perirenal fascia of Gerota

- adrenal gland
- pararenal fat
- adrenal gland
- peritoneum
- liver
- colon
- kidney
- transversalis fascia
  - (ant. layer of Gerota's f.)
  - (post. layer of Gerota's f.)
  - peritoneum
  - Toldt’s fascia
  - psoas fascia
  - Zuckerkanicl’s fascia
- Gerota’s fascia
- perirenal fat
- L2

From Netter’s Atlas
Imaging

Adrenal tumor

From Ellis et al. 1991

From web reference 3

From Ellis et al. 1991
References

Print

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