

LAB 1 - SUPERFICIAL BACK

Date: October 12, 2009

Time: 11:00 am

Corresponding Lecture:

Lecturer: Frederick Wezeman, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., 482-496

NO CASE FOR FIRST LAB

Objectives pertinent to this dissection:

1. Describe the anatomy of a spinal nerve (e.g. as exemplified by a thoracic spinal nerve, including its origin from dorsal and ventral spinal roots, its main motor and cutaneous branches and any autonomic component).
2. Identify the principal muscle groups and the major longitudinal ligaments of the vertebral column and discuss their functional role in stability and movement of the vertebral column.
3. Describe the superficial back muscles.
4. Describe the nerves and blood supply to the back and dorsal region of the neck.
5. Interpret standard diagnostic images of the vertebral column.

Must find these structures:

Muscles

- trapezius muscle
- latissimus dorsi muscle
- serratus anterior muscle
- levator scapulae muscle
- romboideus major and minor muscles
- posterior superior and inferior serratus muscles
- erector spinae muscle (3 parts: iliocostalis, longissimus, spinalis)
- splenius muscle
- longissimus capitis muscle
- semispinalis capitis muscle
- posterior rectus capitis major muscle
- posterior rectus capitis minor muscle
- obliquus capitis inferioris muscle
- obliquus capitis superioris muscle

Nerves

- spinal accessory nerve (C.N. XI)

- thoracodorsal nerve
- long thoracic nerve
- greater occipital nerve

Arteries

- transverse cervical artery (superficial branch)
- thoracodorsal artery
- lateral thoracic artery

Other Structures

- thoracolumbar fascia

On the skeleton, you should find:

- the occipital protuberance
- vertebra prominens (C7)
- angles and borders of the scapulae
- vertebral spinous processes
- iliac crests.
- transverse processes
- spinous process
- body
- articular processes and facets
- laminae
- pedicles
- transverse process of C1
- posterior arch of C1

For the dissection of the back, you may find:

- dorsal scapular nerve (finger's breadth from scapular border - deep and between the levator scapular and rhomboideus minor muscle).
- dorsal scapular artery (or deep branch of transverse cervical a.)
- occipital artery (where it crosses the greater occipital nerve)
- vertebral artery (above the posterior arch of C1)
- dorsal rami of spinal nerves
- transversospinalis muscles (e.g., short and long rotators).
- ligaments that interconnect vertebrae including:
 - ligamentum flavum
 - anterior longitudinal ligament
 - posterior longitudinal ligament
 - supraspinous ligament
 - interspinous ligament

LAB 2 – DEEP BACK

Date: October 13, 2009

Time: 9:30 am

Corresponding Lecture: Back

Lecturer: John McNulty, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., 482-496

Objectives pertinent to this dissection:

1. Describe the main anatomical features of a typical vertebra. Identify the atlas, axis, typical cervical, thoracic, lumbar vertebrae and sacrum and recognize their characteristic features.
2. Describe the structures, regions and functions of the vertebral column. Describe the range of movement of the entire vertebral column and its individual regions.
3. Describe the anatomy of intervertebral facet joints and intervertebral discs. Explain the role of the discs in weight-bearing by the vertebral column and describe how disc herniation may impinge upon spinal nerve roots and /or the spinal cord.
4. Identify the principal muscle groups and the major longitudinal ligaments of the vertebral column and discuss their functional role in stability and movement of the vertebral column.
5. Describe the anatomical relationships of the meninges to the spinal cord and dorsal and ventral nerve roots. Describe the anatomy of lumbar puncture.
6. Describe the nerves and blood supply to the back and dorsal region of the neck.
7. Interpret standard diagnostic images of the vertebral column.

Case:

A weight lifter was preparing for competition by lifting increasingly heavy weights. During hyperextension of his vertebral column, he suddenly felt a severe pain in his lower back. Following a physical examination, it was decided that he was experiencing acute back pain.

Clinicoanatomical Problems:

- What was the likely cause of the man's acute back pain?
- Which back muscles are commonly affected?
- What symptoms and signs would you anticipate in persons with this condition?
- What do you think might prevent this type of back injury?

For the dissection of the back, you should find:

Muscles

- trapezius muscle
- latissimus dorsi muscle
- serratus anterior muscle
- levator scapulae muscle
- rhomboideus major and minor muscles
- posterior superior and inferior serratus muscles
- erector spinae muscle (3 parts: iliocostalis, longissimus, spinalis)
- splenius muscle
- longissimus capitis muscle
- semispinalis capitis muscle
- posterior rectus capitis major muscle
- posterior rectus capitis minor muscle
- obliquus capitis inferioris muscle
- obliquus capitis superioris muscle

Nerves

- spinal accessory nerve (C.N. XI)
- thoracodorsal nerve
- long thoracic nerve
- greater occipital nerve

Arteries

- transverse cervical artery (superficial branch)
- thoracodorsal artery
- lateral thoracic artery

Other

- thoracolumbar fascia

On the skeleton, you should find:

- the occipital protuberance
- vertebra prominens (C7)
- angles and borders of the scapulae
- vertebral spinous processes
- iliac crests.
- transverse processes

- spinous process
- body
- articular processes and facets
- laminae
- pedicles
- transverse process of C1
- posterior arch of C1

For the dissection of the back, you may find:

- dorsal scapular nerve (finger's breadth from scapular border - deep and between the levator scapular and rhomboideus minor muscle).
- dorsal scapular artery (or deep branch of transverse cervical a.)
- occipital artery (where it crosses the greater occipital nerve)
- vertebral artery (above the posterior arch of C1)
- dorsal rami of spinal nerves
- transversospinalis muscles (e.g., short and long rotators).
- ligaments that interconnect vertebrae including:
 - ligamentum flavum
 - anterior longitudinal ligament
 - posterior longitudinal ligament
 - supraspinous ligament
 - interspinous ligament

LAB 3 – SPINE AND SPINAL CORD SUBOCCIPIAL TRIANGLE

Date: October 14, 2009

Time: 2:15 pm

Corresponding Lecture: Scapula and Pectoral region

Lecturer: John Santaniello, MD

Reading Assignment: Clinically Oriented Anatomy, 6th Ed., pp. 440-481; 496-507

Objectives pertinent to this dissection:

1. Describe the main anatomical features of a typical vertebra. Identify the atlas, axis, typical cervical, thoracic, lumbar vertebrae and sacrum and recognize their characteristic features.
2. Describe the anatomical relationships of the meninges to the spinal cord and dorsal and ventral nerve roots. Describe the anatomy of lumbar puncture.
3. Describe the dorsal region of the neck including the suboccipital triangle.
4. Describe the nerves and blood supply to the back and dorsal region of the neck.
5. Interpret standard diagnostic images of the vertebral column.

Case:

A 13-year-old competitive gymnast who practiced 18 to 20 hours a week on her routines complained of low back pain. A physical examination and radiographs revealed that she had a stress fracture of L5 vertebra.

Clinicoanatomical Problems:

- What repetitive movement of the vertebral column may result in a stress fracture of the vertebral column?
- What region and vertebra of the column is usually involved?
- What is the clinical name given to the bony defect?
- What activities do you think might produce this type of stress fracture?

For the dissection of the back, you should find:

Muscles

- trapezius muscle
- latissimus dorsi muscle

- serratus anterior muscle
- levator scapulae muscle
- rhomboideus major and minor muscles
- posterior superior and inferior serratus muscles
- erector spinae muscle (3 parts: iliocostalis, longissimus, spinalis)
- splenius muscle
- longissimus capitis muscle
- semispinalis capitis muscle
- posterior rectus capitis major muscle
- posterior rectus capitis minor muscle
- obliquus capitis inferioris muscle
- obliquus capitis superioris muscle

Nerves

- spinal accessory nerve (C.N. XI)
- thoracodorsal nerve
- long thoracic nerve
- greater occipital nerve

Arteries

- transverse cervical artery (superficial branch)
- thoracodorsal artery
- lateral thoracic artery

Other

- thoracolumbar fascia

On the skeleton, you should find:

- the occipital protuberance
- vertebra prominens (C7)
- angles and borders of the scapulae
- vertebral spinous processes
- iliac crests.
- transverse processes
- spinous process
- body
- articular processes and facets
- laminae
- pedicles
- transverse process of C1

- posterior arch of C1

For the dissection of the back, you may find:

- dorsal scapular nerve (finger's breadth from scapular border - deep and between the levator scapular and rhomboideus minor muscle).
- dorsal scapular artery (or deep branch of transverse cervical a.)
- occipital artery (where it crosses the greater occipital nerve)
- vertebral artery (above the posterior arch of C1)
- dorsal rami of spinal nerves
- transversospinalis muscles (e.g., short and long rotators).
- ligaments that interconnect vertebrae including:
 - ligamentum flavum
 - anterior longitudinal ligament
 - posterior longitudinal ligament
 - supraspinous ligament
 - interspinous ligament

For the dissection of the spinal cord, you should find:

Other

- the dura
- dorsal and ventral roots
- dorsal root ganglion
- arachnoid
- pia
- roots of the cauda equina
- filum terminale internum
- conus medullaris
- You should know the bony parts of the vertebrae and the ligaments that connect them.
- Understand the contents of the epidural, subdural and subarachnoid spaces.

For the dissection of the spinal cord, you may find:

- denticulate ligament
- dorsal and ventral rami of spinal nerve
- branches of the internal venous plexus

LAB 4 – DELTOID AND SCAPULAR REGION

Date: October 15, 2009

Time: 9:45 am

Corresponding Lecture: Vertebral Column Spinal Cord

Lecturer: John McNulty, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th Ed., pp. 98-106; 672-675; 688-693; 697-712; 726-727

Objectives pertinent to this dissection:

1. Describe and demonstrate the main anatomical landmarks of the clavicle, scapula, humerus, radius and ulna. Identify the carpal, metacarpal and phalanges of the wrist and hand and their relative positions.
2. Describe the origin, course and distribution of the major arteries and their branches that supply the shoulder, arm and forearm in relation to common sites of injury. Explain the importance of anastomoses between branches of these arteries at the shoulder and elbow.
3. Describe the organization of the brachial plexus, its origin in the neck and continuation to the axilla and upper limb.
4. Describe the boundaries of the axilla. List its contents, including the major vessels and parts of the brachial plexus.
5. Describe the movements of the pectoral girdle: identify the muscles responsible for its movements and summarize their main attachments and motor nerve supply.
6. Describe the muscles and ligaments that contribute to the stability of the shoulder joint and explain the anatomy of a dislocated humeral head.
7. Describe the functional consequences of injuries to the axillary, musculocutaneous, radial, median and ulnar nerves.
8. Explain the loss of function resulting from injuries to the roots and trunks of the brachial plexus.
9. Identify the anatomical features of standard diagnostic images of the upper limb.

Case

A 35 year-old baseball pitcher told his catcher and coach that he felt a gradual onset of shoulder pain. He continued to pitch but had to stop because of pain and weakness, especially during abduction and lateral rotation of his arm. When examined by the team physician, supraspinatus tenderness was detected near the greater tubercle of his humerus. An MRRI revealed a tear in the pitcher's rotator cuff.

Clinicoanatomical Problems

- What is the rotator cuff of the shoulder?
- What usually causes rotator cuff strain?
- What part of the rotator cuff usually tears?
- Do these injuries occur only in baseball pitchers?
- What shoulder movement is weak and causes pain?

For the dissection of the deltoid region, you should find:

Muscles

- deltoid muscle
- supraspinatus muscle
- infraspinatus muscle
- teres minor muscle
- teres major muscle
- long head of triceps brachii muscle

Nerves

- axillary nerve
- suprascapular nerve

Arteries

- posterior circumflex humeral artery
- circumflex scapular artery
- suprascapular artery

Other

- quadrangular space
- triangular space

On the skeleton, find:

- clavicle
- spine of scapula
- acromion

- deltoid tuberosity of humerus
- superior transverse ligament of the scapula

For the dissection of the deltoid region, you may find:

- inferior transverse ligament of the scapula
- anastomosis of suprascapular artery with circumflex scapular artery

LAB 5 – BREAST AND PECTORAL REGION

Date: October 19, 2009

Time: 9:30 am

Corresponding Lecture: Scapula and Pectoral Region

Lecturer: John Santaniello, MD

Reading Assignment: Clinically Oriented Anatomy, 6th Ed., pp. 98-106; 672-675; 688-693; 697-712; 726-727

Objectives pertinent to this dissection:

1. Describe the pectoral musculature, vessels and nerves.
2. Describe the anatomy of the breast, axillary lymph nodes and importance of lymphatic drainage of the breast.
3. Describe the course of the ascending aorta, the arch of the aorta and the descending thoracic aorta. Name their major branches and the structures they supply.
4. Describe the origins, course and relationships of the brachiocephalic veins,
5. Describe the course and major relations of the thoracic duct and explain its function.
6. Identify major structures on standard diagnostic images of the thorax

Case

A 46 year-old woman consulted her physician about a firm, painless lump in her left breast. During the physical examination, the physician felt a lump in the upper outer quadrant of the breast, he also observed dimpling and thickening of the skin in this quadrant and noticed that her left nipple was noticeably higher than the right one. Palpitation of the axilla revealed enlarged, firm lymph nodes. A diagnosis of carcinoma of the breast was made.

Clinicoanatomical Problems

- Where would most lymph from the left upper outer quadrant of the breast transport most of the cancer cells?
- To what other lymph nodes may the lymph carry cancer cells?
- What caused the thickening and dimpling of the skin and elevation of the nipple?

For the dissection of the deltoid region, you should find:

Muscles

- deltoid muscle
- supraspinatus muscle
- infraspinatus muscle
- teres minor muscle
- teres major muscle
- long head of triceps brachii muscle

Nerves

- axillary nerve
- suprascapular nerve

Arteries

- posterior circumflex humeral artery
- circumflex scapular artery
- suprascapular artery

Other

- quadrangular space
- triangular space

On the skeleton, find:

- clavicle
- spine of scapula
- acromion
- deltoid tuberosity of humerus
- superior transverse ligament of the scapula

For the dissection of the deltoid region, you may find:

- inferior transverse ligament of the scapula
- anastomosis of suprascapular artery with circumflex scapular artery

LAB 6 – POSTERIOR TRIANGLE (SUPERFICIAL)

Date: October 20, 2009

Time: 9:30 am

Corresponding Lecture: Superficial Posterior Triangle, Brachial Plexus

Lecturer: Lydia DonCarlos, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp. 693-697; 713-731; 989-997

Objectives pertinent to this dissection:

1. Describe the courses of the main veins of the upper limb; contrast the functions of the deep and superficial veins. Identify the site of phlebotomy and arterial blood gas concentration sampling.
2. Describe the organization of the brachial plexus, its origin in the neck and continuation to the axilla and upper limb.
3. Describe the origin, course and function of the axillary, radial, musculocutaneous, median and ulnar nerves in the arm, forearm, wrist and hand. Name the muscles these nerves supply as well as their sensory distribution. Predict the consequences of injury to these nerves.
4. Describe the boundaries of the axilla. List its contents, including the major vessels and parts of the brachial plexus.

Case

During a difficult breach delivery of a large baby, strong lateral flexion of the infant's trunk and neck was performed to deliver the head. Complete loss of sensation and complete paralysis of the right limb was evident from the time of birth. In addition, his right eyelid dropped. During a discussion with a resident in obstetrics the expression *iatrogenic injury* was used.

Clinicoanatomical Problems

- What birth injury probably caused this severe injury to the child's upper limb?
- What is an iatrogenic injury?
- Do you think this type of brachial injury is amenable to surgery (e.g., suturing of nerves)?
- What caused his right eyelid to droop?
- Of what syndrome is this eyelid defect a part?

For the dissection of the posterior triangle, you should find:

Muscles

- platysma
- trapezius

- sternocleidomastoid
- omohyoid
- anterior scalene
- middle scalene

Nerves

- spinal accessory nerve
- great auricular nerve
- lesser occipital nerve
- one or more supraclaviculars - lateral, intermediate, medial branches
- roots of the brachial plexus
- suprascapular nerve
- long thoracic nerve

Arteries and Veins

- external jugular vein
- transverse cervical artery
- suprascapular artery
- subclavian artery and vein
- axillary artery and vein

On the skeleton, find:

- mandible
- clavicle
- mastoid process of temporal bone

For the dissection of the posterior triangle, you may find:

- transverse cervical (coli) nerve
- cervical branch of C.N. VII to platysma
- dorsal scapular artery (if you don't have a deep branch of the transvers cervical)
- dorsal scapular nerve

LAB 7 – POSTERIOR TRIANGLE (DEEP)

Date: October 21, 2009

Time: 2:00 pm

Corresponding Lecture: Superficial Posterior Triangle, Brachial Plexus

Lecturer: Lydia DonCarlos, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp. 693-697; 713-731; 989-997

Objectives pertinent to this dissection:

1. Describe the courses of the main veins of the upper limb; contrast the functions of the deep and superficial veins. Identify the site of phlebotomy and arterial blood gas concentration sampling.
2. Describe the organization of the brachial plexus, its origin in the neck and continuation to the axilla and upper limb.
3. Describe the origin, course and function of the axillary, radial, musculocutaneous, median and ulnar nerves in the arm, forearm, wrist and hand. Name the muscles these nerves supply as well as their sensory distribution. Predict the consequences of injury to these nerves.
4. Describe the boundaries of the axilla. List its contents, including the major vessels and parts of the brachial plexus.

Case

A 32-year-old man purchased an older home that was badly in need of renovations and painting. As he was painting the ceiling in a large room, he felt pain and tingling in his right shoulder and in the proximal part of his right arm. During the physical examination, the physician examined the radial pulse at his right wrist and observed that it decreased when he raised the man's limb above the shoulder. After the limb had been elevated for several minutes, the person said that he felt tingling and some pain around his shoulder. The physician noted *cyanosis*, edema of his hand, and distension of the superficial limb veins.

Clinicoanatomical Problems

- Compression of what structures in the axilla could produce the signs and symptoms described?
- What bony structure do you think could compress these axillary structures?
- What is the clinical designation for this type of compression syndrome?

For the dissection of the posterior triangle, you should find:

Muscles

- platysma
- trapezius
- sternocleidomastoid
- omohyoid
- anterior scalene
- middle scalene

Nerves

- spinal accessory nerve
- great auricular nerve
- lesser occipital nerve
- one or more supraclaviculars - lateral, intermediate, medial branches
- roots of the brachial plexus
- suprascapular nerve
- long thoracic nerve

Arteries and Veins

- external jugular vein
- transverse cervical artery
- suprascapular artery
- subclavian artery and vein
- axillary artery and vein

On the skeleton, find:

- mandible
- clavicle
- mastoid process of temporal bone

For the dissection of the posterior triangle, you may find:

- transverse cervical (coli) nerve
- cervical branch of C.N. VII to platysma
- dorsal scapular artery (if you don't have a deep branch of the transvers cervical)
- dorsal scapular nerve

LAB 8 – AXILLA AND ARM

Date: October 22, 2009

Time: 9:45 am

Corresponding Lecture: Arm and Forearm

Lecturer: Lydia DonCarlos, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp. 672-693; 731-773

Objectives pertinent to this dissection:

1. Describe the close relations of the bones and joints (e.g. bursae, blood vessels, nerves ligaments and tendons), which may be injured by fractures or dislocation.
2. Describe the fascial compartments delimiting the major muscle groups of the upper limb. Explain the functional importance of those compartments and their contents.
3. Describe the origin, course and distribution of the major arteries and their branches that supply the shoulder, arm and forearm in relation to common sites of injury. Explain the importance of anastomoses between branches of these arteries at the shoulder and elbow.
4. Describe the courses of the main veins of the upper limb; contrast the functions of the deep and superficial veins. Identify the site of phlebotomy and arterial blood gas concentration sampling.
5. Describe the organization of the brachial plexus, its origin in the neck and continuation to the axilla and upper limb.
6. Describe the origin, course and function of the axillary, radial, musculocutaneous, median and ulnar nerves in the arm, forearm, wrist and hand. Name the muscles these nerves supply as well as their sensory distribution. Predict the consequences of injury to these nerves.
7. Describe the boundaries of the axilla. List its contents, including the major vessels and parts of the brachial plexus.
8. Describe the movements of the pectoral girdle: identify the muscles responsible for its movements and summarize their main attachments and motor nerve supply.
9. Explain the movements of supination and pronation; identify the muscles responsible for these movements and summarize their main attachments and motor nerve supply.
10. Describe the functional consequences of injuries to the axillary, musculocutaneous, radial, median and ulnar nerves.
11. Explain the loss of function resulting from injuries to the roots and trunks of the brachial plexus.
12. Describe the anatomical basis of the assessment of cutaneous sensation in the dermatomes of the upper limb.
13. Identify the anatomical features of standard diagnostic images of the upper limb.

Case

A 25-year-old woman lost control while skiing and severely fractured her right tibia at the boot line. Because it was a comminuted fracture, a metal plate was surgically placed in her leg to stabilize the fracture. She was told she would be on crutches for approximately three months. After using the crutches frequently for approximately six weeks, she experienced pain and paresthesia in the posterior aspect of her right forearm and on the dorsum of her hand. When she

reported this to her physician, he told her these symptoms were the result of prolonged and faulty use of her crutches.

Clinicoanatomical Problems

- Compression of what nerve probably produced the pain and paresthesia in her right forearm and hand?
- Why did the physician say that the neurological symptoms were the result of prolonged and faulty use of her crutches?
- How could this nerve compression be eliminated?
- If the cause of the nerve compression is not eliminated, what do you think the result will be?

For the dissection of the axilla, you should find:

Muscles

- coracobrachialis muscle
- biceps brachii muscle
- subscapularis muscle

Nerves

- superior, middle and inferior trunks of the brachial plexus
- anterior and posterior divisions of the brachial plexus
- lateral, medial and posterior cords of the brachial plexus
- median nerve
- musculocutaneous nerve
- ulnar nerve
- axillary nerve
- thoracodorsal nerve
- upper and lower subscapular nerves
- lateral and medial pectoral nerves
- medial brachial and antebrachial nerves

Arteries

- axillary artery
- thoracoacromial trunk and branches dissected earlier
- thoracodorsal artery
- subscapular artery
- anterior and posterior humeral circumflex arteries
- circumflex scapular artery

- lateral thoracic artery

For the dissection of the axilla, you may find:

- superior thoracic artery

LAB 9 – FOREARM

Date: October 23, 2009

Time: 10:45 am

Corresponding Lecture: Arm and Forearm

Lecturer: Lydia DonCarlos, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp. 672-693; 731-773

Objectives pertinent to this dissection:

1. Describe the close relations of the bones and joints (e.g. bursae, blood vessels, nerves ligaments and tendons), which may be injured by fractures or dislocation.
2. Describe the fascial compartments delimiting the major muscle groups of the upper limb. Explain the functional importance of those compartments and their contents.
3. Describe the origin, course and distribution of the major arteries and their branches that supply the shoulder, arm and forearm in relation to common sites of injury. Explain the importance of anastomoses between branches of these arteries at the shoulder and elbow.
4. Demonstrate the sites at which pulses in the brachial, radial and ulnar arteries may be located.
5. Describe the courses of the main veins of the upper limb; contrast the functions of the deep and superficial veins. Identify the site of phlebotomy and arterial blood gas concentration sampling.
6. Describe the boundaries of the axilla. List its contents, including the major vessels and parts of the brachial plexus.
7. Describe the anatomy of the elbow joint. Demonstrate the movements of flexion and extension, identify the muscles responsible for these movements and summarize their main attachments and motor nerve supply.
8. Explain the movements of supination and pronation; identify the muscles responsible for these movements and summarize their main attachments and motor nerve supply.
9. Describe the anatomy of the wrist and articulations of the radius and ulna with the carpal bones. Describe and demonstrate movements at the wrist and identify the muscle groups responsible for the movements. Describe the relative positions of the tendons, vessels and nerves at the wrist.
10. Describe the position and function of the retinacula of the wrist and the tendon sheaths of the wrist and hand. Explain carpal tunnel syndrome and the spread of infection in tendon sheaths.
11. Describe the functional consequences of injuries to the axillary, musculocutaneous, radial, median and ulnar nerves.
12. Explain the loss of function resulting from injuries to the roots and trunks of the brachial plexus.
13. Describe the anatomical basis of the assessment of cutaneous sensation in the dermatomes of the upper limb.

14. Describe the elbow joint and its major ligaments.
 15. Identify the anatomical features of standard diagnostic images of the upper limb.
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Case

A 32-year-old woman learning to play tennis practiced daily for approximately two weeks. She reported to her coach that she was experiencing pain over the lateral region of her elbow that radiated down her forearm. Familiar with this complaint by beginners, he asked her to hold the tennis racket and extend her hand at the wrist. She felt no pain until he resisted extension of her hand. When he asked her to pinpoint the area of most pain, she placed her finger over her lateral epicondyle. When he put pressure on the epicondyle, she pulled her elbow away because of the severe pain. The coach compressed the common extensor tendon, and she again experienced intense pain.

Clinicoanatomical Problems

- What elbow injury has this woman sustained?
- What are the mechanisms of this injury?
- Does this injury occur only in tennis players?
- Where is the discrete point of local tenderness in these injuries?
- Why did the woman experience radiation of pain along the posterolateral aspect of her forearm?

For the dissection of the arm and forearm, you should find:

Muscles

- coracobrachialis muscle
- biceps brachii muscle and bicipital aponeurosis
- brachialis muscle
- triceps brachii
- brachioradialis
- pronator teres
- flexor carpi radialis
- flexor carpi ulnaris
- palmaris longus (if present)
- flexor digitorum superficialis
- flexor digitorum profundus
- flexor pollicis longus
- pronator quadratus
- extensor carpi radialis longus
- extensor carpi radialis brevis

- extensor ulnaris
- extensor digitorum
- extensor digit minimi
- extensor pollicis longus
- extensor pollicis brevis
- abductor pollicis longus
- extensor indices
- anconeus
- dorsal interosseus muscles

Nerves

- superficial radial nerve
- lateral antebrachial nerve
- medial brachial nerve
- medial antebrachial nerve
- axillary nerve
- median nerve
- musculocutaneous nerve
- ulnar nerve
- radial nerve
- medial brachial nerve
- medial antebrachial nerve
- anterior interosseus nerve
- radial nerve - superficial and deep branches
- posterior interosseus nerve

Arteries

- brachial artery
- profunda brachii artery
- radial artery
- ulnar artery
- superior ulnar collateral artery
- common interosseus artery
- anterior interosseus artery
- posterior interosseus artery
- dorsal metacarpal arteries

Other

- cephalic vein
- basilic vein
- median cubital vein

In addition: find the following bony parts:

- greater and lesser tubercle of humerus
- anatomical and surgical necks of humerus
- lateral and medial epicondyles of humerus
- capitulum of humerus
- trochlea of humerus
- deltoid tuberosity of humerus
- olecranon fossa
- groove for radial nerve
- head of radius
- radial tuberosity
- olecranon of ulna
- styloid process of radius and ulna
- supraglenoid and infraglenoid tubercles of scapula
- intertubercular groove (sulcus)
- radial groove of humerus

For the dissection of the arm and forearm, you may find:

Nerves:

- superior lateral brachial cutaneous nerve
- inferior lateral brachial cutaneous nerve
- posterior brachial cutaneous nerve
- posterior antebrachial cutaneous nerve
- posterior brachial cutaneous nerve
- posterior brachial cutaneous nerve

Arteries:

- anterior and posterior ulnar recurrent arteries
- radial recurrent
- interosseus recurrent

LAB 10 – FINISH ARM, FOREARM, AND BRACHIAL PLEXUS

Date: October 26, 2009

Time: 10:30 am

Corresponding Lecture: Arm and Forearm

Lecturer: Lydia DonCarlos, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp. 672-693; 731-773

Objectives

1. Describe and demonstrate the main anatomical landmarks of the clavicle, scapula, humerus, radius and ulna. Identify the carpal, metacarpal and phalanges of the wrist and hand and their relative positions.
2. Describe the close relations of the bones and joints (e.g. bursae, blood vessels, nerves ligaments and tendons), which may be injured by fractures or dislocation.
3. Describe the fascial compartments delimiting the major muscle groups of the upper limb. Explain the functional importance of those compartments and their contents.
4. Describe the origin, course and distribution of the major arteries and their branches that supply the shoulder, arm and forearm in relation to common sites of injury. Explain the importance of anastomoses between branches of these arteries at the shoulder and elbow.
5. Demonstrate the sites at which pulses in the brachial, radial and ulnar arteries may be located.
6. Describe the courses of the main veins of the upper limb; contrast the functions of the deep and superficial veins. Identify the site of phlebotomy and arterial blood gas concentration sampling.
7. Describe the organization of the brachial plexus, its origin in the neck and continuation to the axilla and upper limb.
8. Describe the origin, course and function of the axillary, radial, musculocutaneous, median and ulnar nerves in the arm, forearm, wrist and hand. Name the muscles these nerves supply as well as their sensory distribution. Predict the consequences of injury to these nerves.
9. Describe the boundaries of the axilla. List its contents, including the major vessels and parts of the brachial plexus.
10. Describe the movements of the pectoral girdle: identify the muscles responsible for its movements and summarize their main attachments and motor nerve supply.
11. Describe the anatomy of the elbow joint. Demonstrate the movements of flexion and extension, identify the muscles responsible for these movements and summarize their main attachments and motor nerve supply.
12. Explain the movements of supination and pronation; identify the muscles responsible for these movements and summarize their main attachments and motor nerve supply.
13. Describe the position and function of the retinacula of the wrist and the tendon sheaths of the wrist and hand. Explain carpal tunnel syndrome and the spread of infection in tendon sheaths.
14. Describe the functional consequences of injuries to the axillary, musculocutaneous, radial, median and ulnar nerves.
15. Explain the loss of function resulting from injuries to the roots and trunks of the brachial plexus.

16. Describe the anatomical basis of the assessment of cutaneous sensation in the dermatomes of the upper limb.
17. Describe the elbow joint and its major ligaments.
18. Identify the anatomical features of standard diagnostic images of the upper limb.

Case

A 57-year-old man was repairing the deck attached to his cottage. After several hours he said he was tired but refused to stop working. Shortly thereafter he fell off the porch, breaking three ribs and both wrists. The left wrist had a hairline fracture; however, the fracture of the right wrist was a typical displaced *Colles fracture*. An undisplaced fracture of the ulnar styloid process also occurred. The radial fracture was reduced and the man's wrist was immobilized in a below elbow cast for four weeks. The fracture was well united in six weeks.

Clinicoanatomical Problems

- What wrist deformity is present in a typical Colles fracture? Explain why it happens.
- Why is a Colles fracture more common in older persons?
- What joint is often subluxated in malunion of the radial fragments?
- Movements of what other joint may be affected?

For the dissection of the arm and forearm, you should find:

Muscles

- coracobrachialis muscle
- biceps brachii muscle and bicipital aponeurosis
- brachialis muscle
- triceps brachii
- brachioradialis
- pronator teres
- flexor carpi radialis
- flexor carpi ulnaris
- palmaris longus (if present)
- flexor digitorum superficialis
- flexor digitorum profundus
- flexor pollicis longus
- pronator quadratus
- extensor carpi radialis longus
- extensor carpi radialis brevis
- extensor ulnaris
- extensor digitorum
- extensor digit minimi
- extensor pollicis longus

- extensor pollicis brevis
- abductor pollicis longus
- extensor indices
- anconeus
- dorsal interosseus muscles

Nerves

- superficial radial nerve
- lateral antebrachial nerve
- medial brachial nerve
- medial antebrachial nerve
- axillary nerve
- median nerve
- musculocutaneous nerve
- ulnar nerve
- radial nerve
- medial brachial nerve
- medial antebrachial nerve
- anterior interosseus nerve
- radial nerve - superficial and deep branches
- posterior interosseus nerve

Arteries

- brachial artery
- profunda brachii artery
- radial artery
- ulnar artery
- superior ulnar collateral artery
- common interosseus artery
- anterior interosseus artery
- posterior interosseus artery
- dorsal metacarpal arteries

Other

- cephalic vein
- basilic vein
- median cubital vein

In addition: find the following bony parts:

- greater and lesser tubercle of humerus
- anatomical and surgical necks of humerus
- lateral and medial epicondyles of humerus
- capitulum of humerus

- trochlea of humerus
- deltoid tuberosity of humerus
- olecranon fossa
- groove for radial nerve
- head of radius
- radial tuberosity
- olecranon of ulna
- styloid process of radius and ulna
- supraglenoid and infraglenoid tubercles of scapula
- intertubercular groove (sulcus)
- radial groove of humerus

For the dissection of the arm and forearm, you may find:

Nerves

- superior lateral brachial cutaneous nerve
- inferior lateral brachial cutaneous nerve
- posterior brachial cutaneous nerve
- posterior antebrachial cutaneous nerve
- posterior brachial cutaneous nerve
- posterior brachial cutaneous nerve

Arteries

- anterior and posterior ulnar recurrent arteries
- radial recurrent
- interosseus recurrent

LAB 11 – HAND

Date: October 27, 2009

Time: 9:30 AM

Corresponding Lecture: Hand

Lecturer: Lydia DonCarlos, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp.773-793

Objectives pertinent to this dissection:

1. Describe the fascial compartments delimiting the major muscle groups of the upper limb. Explain the functional importance of those compartments and their contents.
2. Demonstrate the sites at which pulses in the brachial, radial and ulnar arteries may be located.
3. Describe the origin, course and function of the axillary, radial, musculocutaneous, median and ulnar nerves in the arm, forearm, wrist and hand. Name the muscles these nerves supply as well as their sensory distribution. Predict the consequences of injury to these nerves.
4. Describe the anatomy of the wrist and articulations of the radius and ulna with the carpal bones. Describe and demonstrate movements at the wrist and identify the muscle groups responsible for the movements. Describe the relative positions of the tendons, vessels and nerves at the wrist.
5. Name and demonstrate the movements of the fingers and thumb. Describe the position, function and nerve supply of the muscles and tendons involved in these movements, differentiating between those in the forearm and those intrinsic to the hand.
6. Describe the vascular supply to the hand.
7. Describe the position and function of the retinacula of the wrist and the tendon sheaths of the wrist and hand. Explain carpal tunnel syndrome and the spread of infection in tendon sheaths.
8. Describe the functional consequences of injuries to the axillary, musculocutaneous, radial, median and ulnar nerves.
9. Explain the loss of function resulting from injuries to the roots and trunks of the brachial plexus.

Case

A 17-year-old youth was tripped accidentally during a basketball game and fell hard on his outstretched hand. Approximately two weeks after hurting his wrist, he consulted his family physician about severe wrist pain. When she asked him where he felt the pain, he pointed to the area of the anatomical snuff box. When the physician applied pressure in the snuff box with his finger, the youth winced the pain. She requested radiographs of the wrist. A hairline fracture of a large carpal bone was observed.

Clinicoanatomical Problems

- What bone is usually fractured when tenderness in the anatomical snuff box is evident following forced hyperextension of the wrist?
- Why is a fracture of this bone difficult to detect?

- If the fracture is not detected and rigidly immobilized, what serious condition may develop? Explain why this may happen.

For the dissection of the hand, you should find:

Muscles

- flexor pollicis brevis
- abductor pollicis brevis
- opponens pollicis
- tendons of flexor digitorum superficialis and profundus
- lumbricals
- flexor digiti minimi brevis
- abductor digiti minimi
- opponens digiti minimi
- palmar interosseus
- dorsal interosseus
- adductor pollicis

Nerves

- recurrent median nerve
- common digital nerves
- proper digital nerves
- ulnar nerve - superficial and deep branches.

Arteries

- superficial palmar arch
- common digital arteries
- proper digital arteries

Find on the skeleton:

- scaphoid
- lunate
- triquetrum
- pisiform
- hamate
- capitate
- trapezoid
- trapezium
- metacarpals
- phalanges (proximal, middle, distal)

For the dissection of the hand, you may find:

- dorsal carpal artery
- deep arterial arch

LAB 12 – FINISH HAND

Date: October 28, 2009

Time: 2:00 PM

Corresponding Lecture: Hand

Lecturer: Lydia DonCarlos, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp.773-793

Objectives pertinent to this dissection:

1. Describe the fascial compartments delimiting the major muscle groups of the upper limb. Explain the functional importance of those compartments and their contents.
2. Demonstrate the sites at which pulses in the brachial, radial and ulnar arteries may be located.
3. Describe the origin, course and function of the axillary, radial, musculocutaneous, median and ulnar nerves in the arm, forearm, wrist and hand. Name the muscles these nerves supply as well as their sensory distribution. Predict the consequences of injury to these nerves.
4. Describe the anatomy of the wrist and articulations of the radius and ulna with the carpal bones. Describe and demonstrate movements at the wrist and identify the muscle groups responsible for the movements. Describe the relative positions of the tendons, vessels and nerves at the wrist.
5. Name and demonstrate the movements of the fingers and thumb. Describe the position, function and nerve supply of the muscles and tendons involved in these movements, differentiating between those in the forearm and those intrinsic to the hand.
6. Describe the vascular supply to the hand.
7. Describe the position and function of the retinacula of the wrist and the tendon sheaths of the wrist and hand. Explain carpal tunnel syndrome and the spread of infection in tendon sheaths.
8. Describe the functional consequences of injuries to the axillary, musculocutaneous, radial, median and ulnar nerves.
9. Explain the loss of function resulting from injuries to the roots and trunks of the brachial plexus.

Case

A depressed 15-year-old girl who had slashed her wrists with a razor blade was rushed to the emergency department of a hospital. The moderate bleeding from her left wrist was soon stopped with slight pressure. The small spurts of blood coming from the lateral side of her right wrist were more difficult to stop.

Physical Examination: Examination of the girl's left hand and wrist revealed that her hand movements were normal and that no loss of sensation had occurred. The following observations were made about her right wrist and hand: two superficial tendons and a large nerve were cut. She could adduct her thumb but was unable to oppose it. She had lost some fine control of movements of her second and third digits and she experienced anesthesia over the lateral half of her palm and digits.

Clinicoanatomical Problems

- Why was the suicide attempt not fatal?
- Which tendon(s) is/are most likely to have been severed?
- What large nerve was undoubtedly cut?
- What tendon is certain to have been severed?
- What superficial artery appears to have been lacerated?
- Would flexion of her wrist be affected?

For the dissection of the hand, you should find:

Muscles

- flexor pollicis brevis
- abductor pollicis brevis
- opponens pollicis
- tendons of flexor digitorum superficialis and profundus
- lumbricals
- flexor digiti minimi brevis
- abductor digiti minimi
- opponens digiti minimi
- palmar interosseus
- dorsal interosseus
- adductor pollicis

Nerves

- recurrent median nerve
- common digital nerves
- proper digital nerves
- ulnar nerve - superficial and deep branches.

Arteries

- superficial palmar arch
- common digital arteries
- proper digital arteries

Find on the skeleton:

- scaphoid
- lunate
- triquetrum
- pisiform

- hamate
- capitate
- trapezoid
- trapezium
- metacarpals
- phalanges (proximal, middle, distal)

For the dissection of the hand, you may find:

- dorsal carpal artery
- deep arterial arch

LAB 13 – THORAX, LUNGS

Date: October 29, 2009

Time: 10:30 AM

Corresponding Lecture: Thorax and Lung

Lecturer: John McNulty, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp. 112-136;

Objectives pertinent to this dissection:

1. Demonstrate the main anatomical landmarks of the thoracic vertebrae, ribs and sternum.
2. Describe the anatomy of the joints between the ribs and vertebral column, the ribs and costal cartilages and the costal cartilages and sternum. Explain the movements made at those joints during respiration.
3. Describe how the boundaries of the superior and inferior thoracic apertures are formed by the vertebrae, ribs, costal cartilages and sternum.
4. Describe the surface projection, attachments and relationships of the diaphragm and the structures that pass through it. Explain the movements it makes during respiration and the motor and sensory nerve supply to it and its pleural and peritoneal coverings.
5. Explain the anatomy of the intercostal muscles. Describe a neurovascular bundle in a typical intercostal space and outline the structures its components supply.
6. Describe the pectoral musculature, vessels and nerves.
7. Describe the anatomy of the breast, axillary lymph nodes and importance of lymphatic drainage of the breast.
8. Demonstrate the surface markings of the heart and great vessels, the margins of the pleura and the lobes and fissures of the lungs.
9. Summarize the anatomy of the bronchial tree.
10. Describe the blood and nerve supply and lymph drainage of the lungs. Describe the structures in the hilum and the mediastinal relations of each lung.
11. Describe the arrangement and contents of the superior, anterior, middle and posterior parts of the mediastinum.
12. Describe the origin, course and distribution of the vagus nerve and its branches and the phrenic nerves on both the right and left sides of the thorax.
13. Describe the composition and function of the sympathetic chains and splanchnic nerves.
14. Describe the course and major relations of the esophagus within the thorax.
15. Describe the course and major relations of the thoracic duct and explain its function.
16. Identify major structures on standard diagnostic images of the thorax.

Case

During a lengthy trip in the car, a 38-year-old woman experienced *substernal discomfort*, pain in the right side of her thorax, and breathlessness. She said that she felt sick to her stomach (*nausea*) and that she was going to faint (*syncope*). Believing she may have been experiencing a heart attack, her husband drove her to a hospital.

Physical Examination: The physician observed evidence of shock and rapid breathing (*tachypnea*). He also noted swollen, tender veins (*varicose vein*), particularly in her right thigh and calf (signs and symptoms of *thrombophlebitis*). On questioning, he learned that she had had painful varicose veins in her lower limbs for some time and that they became extremely painful during her recent long car ride. He also learned that she had been taking birth control pills for approximately nine years. Examination of her lungs revealed a few small, moist *atelectatic rales* (transitory, light crackling sounds) in the right side of her chest. Auscultation also revealed a pleural rub on the right side. Cardiac examination detected *tachycardia* (rapid beating of the heart) and *arrhythmia* (irregularity of the heartbeat). An ECG suggested some right heart strain. Radiographs of her thorax, pulmonary angiograms, photoscans, and fluoroscopy were requested.

Radiology Report: The radiographs show some increase in radiolucency of the right lung. Fluoroscopy of her lungs revealed poor or absent pulsations in the descending branch of the right pulmonary artery and relative anemia of the right lung that is consistent with *pulmonary thromboembolism* (PTE). The photoscans (scintigrams) obtained after intravenous injection of radioactive iodinated (¹³¹I) human albumin microparticles showed practically no pulmonary blood flow to the right lung.

Diagnosis: PTE resulting from the release of a thrombus from a varicose vein in the lower limb.

Clinicoanatomical Problems

- What are the main factors involved in pulmonary thromboembolism and thrombogenesis?
- How do you think the radiologist injected the contrast material into the patient's right ventricle during pulmonary angiography?
- What was the probable cause of the patient's severe substernal discomfort and shoulder pain?

For the dissection of the thoracic wall, you should find:

Muscles

- pectoralis major and minor (reflect)
- external interostal
- internal interostal
- innermost interostal (more difficult to distinguish)
- subcostal (best seen after the rib cage has been removed)

Nerves

- intercostals
- phrenic
- vagus
- recurrent laryngeal (on right and left)

Arteries

- internal thoracic
- anterior intercostal
- arch of aorta
- brachiocephalic
- left common carotid
- left subclavian
- pulmonary trunk
- left and right pulmonary arteries
- pericardiacophrenic

Veins

- superior vena cava
- right brachiocephalic
- left brachiocephalic
- left subclavian
- azygous

Other

- parietal pleura - leave it intact around the lungs as best as possible.
- visceral pleura
- costal pleura
- diaphragmatic pleura
- mediastinal pleura
- pulmonary ligament
- costodiaphragmatic recess
- ligamentum arteriosum

In addition: find the following bony parts:

- manubrium
- body of sternum
- xiphisternum
- ribs and costal arch

For the dissection of the respiratory system, you should find:

Arteries and Veins

- pulmonary arteries
- pulmonary veins

Other

- lobes of lungs
- fissures of the lungs
- bronchi
 - eparterial bronchus
 - hyparterial bronchus (bronchus intermedius)
- cardiac notch
- lingula of left lung

For the dissection of the thoracic wall, you may find:

- lateral and anterior cutaneous nerves
- superior epigastric artery
- musculophrenic artery
- inferior thyroid veins
- left superior intercostal vein
- right superior intercostal vein
- cardiac and pulmonary plexuses

You may find:

- bronchial arteries
- bronchial lymph nodes
- pulmonary plexus

LAB 14 – HEART

Date: 10/30/09

Time: 11:30 AM

Corresponding Lecture: Heart

Lecturer: Frederick Wezeman, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp. 127-160

Objectives pertinent to this dissection:

1. Demonstrate the surface markings of the heart and great vessels, the margins of the pleura and the lobes and fissures of the lungs.
2. Summarize the anatomy of the bronchial tree.
3. Describe the arrangement and contents of the superior, anterior, middle and posterior parts of the mediastinum.
4. Identify the major anatomical features of each chamber of the heart and septa that separate them and explain their functional significance.
5. Describe the structure and position of the atrioventricular, pulmonary and aortic valves.
6. Describe the origin, course and main branches of the left and right coronary arteries and the coronary sulcus and interventricular sulci.
7. Describe the coronary veins.
8. Identify the location of the SA and AV nodes. Understand the anatomical course of the spread of excitation through the chambers of the heart.
9. Demonstrate the arrangement of the fibrous and serous layers of the pericardium.
10. Describe the course of the ascending aorta, the arch of the aorta and the descending thoracic aorta. Name their major branches and the structures they supply.
11. Describe the origins, course and relationships of the brachiocephalic veins, inferior and superior venae cavae and the azygos venous system.
12. Describe the origin, course and distribution of the vagus nerve and its branches and the phrenic nerves on both the right and left sides of the thorax.
13. Demonstrate the surface markings of the heart and the position and site of auscultation of the four major valves.
14. Identify major structures on standard diagnostic images of the thorax.

Case

During a violent argument with his wife, a 44-year-old inebriated man was stabbed with a pairing knife, the blade of which was 9cm long. The knife penetrated the 4th intercostals space along the left sternal border. By the time he was taken to the hospital emergency, the patient was semiconscious, in shock, and gasping for breath. In a few moments he became unconscious and died. The coroner, or medical examiner, performed an autopsy.

Autopsy Report: Death was caused by excessive loss of blood and cardiac tamponade resulting from a stab wound.

Clinicoanatomical Problems:

- using your knowledge of the surface anatomy of the thorax, what organ(s) would you expect to be punctured by the knife?
- Where would the blood likely accumulate?
- Discuss cardiac tamponade and how this condition probably caused the man's death.

For the dissection of the heart, you should find:

Nerves

- phrenic
- vagus
- recurrent laryngeal

Arteries and Veins

- aorta (arch)
- pulmonary trunk
- pulmonary arteries
- superior vena cava
- pulmonary veins
- inferior vena cava
- right and left coronary arteries
- circumflex branch
- anterior interventricular (descending) artery
- posterior interventricular artery
- right marginal artery
- great cardiac vein
- middle cardiac vein
- small cardiac vein
- anterior cardiac veins
- coronary sinus

Other

- oblique sinus
- transverse sinus
- ligamentum arteriosum

- coronary sulcus
- right and left atria
- atrial auricles
- right and left ventricles
- interventricular sulci
- crista terminalis
- muscoli pectinati
- right atrioventricular orifice
- tricuspid valve
- fossa ovalis
- cusps
- chorda tendinae
- papillary muscles
- semilunar cusps
- septomarginal (moderator) band
- bicuspid (mitral) valve
- aortic sinuses
- openings of right and left coronary arteries

LAB 15 – POSTERIOR MEDIASTINUM

Date: November 2, 2009

Time: 9:30 AM

Corresponding Lecture: Superior and Posterior Mediastinum

Lecturer: John McNulty, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp. 160-180

Objectives pertinent to this dissection:

1. Describe the arrangement and contents of the superior, anterior, middle and posterior parts of the mediastinum
2. Describe the course of the ascending aorta, the arch of the aorta and the descending thoracic aorta. Name their major branches and the structures they supply.
3. Describe the origins, course and relationships of the brachiocephalic veins, inferior and superior venae cavae and the azygos venous system.
4. Describe the origin, course and distribution of the vagus nerve and its branches and the phrenic nerves on both the right and left sides of the thorax.
5. Describe the composition and function of the sympathetic chains and splanchnic nerves.
6. Describe the course and major relations of the esophagus within the thorax.
7. Describe the course and major relations of the thoracic duct and explain its function.
8. Identify major structures on standard diagnostic images of the thorax.

Case

A young man who was stabbed in the chest was rushed to a hospital. The stab wound was in the 3rd left intercostals space, just lateral to the sternum. The emergency physician noted that the veins of his face and neck were engorged.

Clinicoanatomical Problems

- what vital structures may have been injured?
- What probably caused the engorgement of his cervical and facial veins?
- What emergency clinical procedure would likely be performed before he was taken to the operating room?

For the dissection of the posterior mediastinum, you should find:

Arteries and Veins

- aorta

- azygos veins
- posterior intercostals

Nerves

- intercostals
- sympathetic chain
- greater splanchnic nerve

Other

- esophagus
- costal pleura

LAB 16 – SUPERIOR MEDIASTINUM

Date: November 3, 2009

Time: 10:30 AM

Corresponding Lecture: Superior Mediastinum

Lecturer: John McNulty, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp.160-180

Objectives pertinent to this dissection:

1. Demonstrate the main anatomical landmarks of the thoracic vertebrae, ribs and sternum.
2. Describe the anatomy of the joints between the ribs and vertebral column, the ribs and costal cartilages and the costal cartilages and sternum. Explain the movements made at those joints during respiration.
3. Describe how the boundaries of the superior and inferior thoracic apertures are formed by the vertebrae, ribs, costal cartilages and sternum.
4. Demonstrate the surface markings of the heart and great vessels, the margins of the pleura and the lobes and fissures of the lungs.
5. Describe the arrangement and contents of the superior, anterior, middle and posterior parts of the mediastinum.
6. Demonstrate the arrangement of the fibrous and serous layers of the pericardium.
7. Describe the course of the ascending aorta, the arch of the aorta and the descending thoracic aorta. Name their major branches and the structures they supply.
8. Describe the origins, course and relationships of the brachiocephalic veins, inferior and superior venae cavae and the azygos venous system.
9. Describe the origin, course and distribution of the vagus nerve and its branches and the phrenic nerves on both the right and left sides of the thorax.
10. Describe the course and major relations of the esophagus within the thorax.
11. Describe the course and major relations of the thoracic duct and explain its function.
12. Demonstrate the surface markings of the heart and the position and site of auscultation of the four major valves.
13. Identify major structures on standard diagnostic images of the thorax.

Case

A 62-year-old man consulted his physician about his difficulty breathing. During the physical examination, the physician palpated the man's trachea in the jugular notch. During cardiac systole, he felt the trachea move abnormally. Radiographic studies revealed an *aneurysm of the arch of the aorta*.

Clinicoanatomical Problems

- What is an aneurysm of the arch of the aorta?
- Why is this abnormality common in older people?
- What structures may be compressed by the aneurysm?
- Why does the trachea move abnormally during cardiac systole?

For the dissection of the superior mediastinum, you should find:

Muscles

- external interostal
- internal interostal
- innermost interostal (more difficult to distinguish)
- subclavius

Nerves

- intercostals
- phrenic
- vagus
- recurrent laryngeal (on right and left)

Arteries

- internal thoracic
- anterior intercostal
- arch of aorta
- brachiocephalic
- left common carotid
- left subclavian
- pulmonary trunk
- left and right pulmonary arteries
- pericardiacophrenic

Veins

- superior vena cava
- right brachiocephalic
- left brachiocephalic
- left subclavian

- azygous

Other

- parietal pleura - leave it intact around the lungs as best as possible.
- visceral pleura
- costal pleura
- ligamentum arteriosum

In addition: find the following bony parts:

- manubrium
- body of sternum

LAB 17 – ANTERIOR ABDOMINAL WALL

Date: November 6, 2009

Time: 11:00 AM

Corresponding Lecture: Anterior Abdominal Wall

Lecturer: John Santaniello, MD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp. 184-216

Objectives pertinent to this dissection:

1. Demonstrate the surface projections of the abdominal organs and identify the palpable viscera.
2. Demonstrate the descriptive regions of the abdomen.
3. Describe the anatomy, innervation and functions of the muscles of the anterior and posterior abdominal walls.
4. In relation to direct and indirect inguinal hernias, demonstrate the anatomy of the attachments of the inguinal ligament, the anatomy of the superficial and deep inguinal rings and how the anterior abdominal wall muscles form the inguinal canal. Describe the contents of the inguinal canal in both males and females.
5. Describe the relationship between the femoral canal and the inguinal ligament and the anatomy of femoral hernias.
6. Describe the position (in relation to the ribs) and form of the spleen in relation to its palpation through the abdominal wall. Explain the significance of its anatomical relationships in relation to trauma to the abdomen.

Case

During clinical rounds a female patient with an indirect inguinal hernia was visited. The physician stated that indirect inguinal hernias are approximately 20 times more common in males than in females.

Clinicoanatomical Problems

- What is the basis for the sex difference in the frequency of this type of hernia?
- Where does the bulging of the hernia occur in females?
- Describe how an indirect inguinal hernia might be distinguished from a femoral hernia, which is more common in females.

For the dissection of the abdominal wall, you should find:

Muscles

- external abdominal oblique

- internal abdominal oblique
- transversus abdominis
- rectus abdominis
- cremaster

Nerves

- thoracoabdominal nerves
- iliohypogastric
- ilioinguinal
- genitofemoral

Arteries

- superior epigastric
- inferior epigastric
- superficial circumflex iliac
- superficial dorsal vein of penis
- deep dorsal vein of penis
- paired dorsal arteries of penis
- testicular artery
- pampiniform plexus of veins
- obliterated umbilical artery (medial umbilical fold)

Other

- inguinal ligament
- superficial inguinal ring
- linea alba
- linea semilunaris
- umbilicus
- rectus sheath
- aponeurosis of external oblique
- conjoined tendon
- fascia of Camper
- spermatic cord
- transversalis fascia
- peritoneum
- inguinal canal
- prepuce
- glans
- frenulum
- corpora cavernosum
- corpus spongiosum

- tunica albuginea
- scrotum
- vas deferens
- epididymus
- obliterated urachus

On the skeleton, you should find:

- anterior superior iliac spine
- iliac crest
- pubic tubercles
- pubic symphysis
- superior pubic ramus

For the dissection of the abdominal wall, you may find:

- Scarpa's fascia
- deep inguinal ring
- arcuate line
- lacunar ligament
- pyramidalis
- internal spermatic fascia
- fundiform ligament
- suspensory ligament
- dartos tunic
- tunica albuginea
- tunica vaginalis

LAB 18 – ABDOMINAL VISCERA

Date: November 9, 2009

Time: 9:30 AM

Corresponding Lecture: Abdomen I

Lecturer: Frederick Wezeman, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp. 217-268

Objectives pertinent to this dissection:

1. Demonstrate the surface projections of the abdominal organs and identify the palpable viscera.
2. Demonstrate the descriptive regions of the abdomen.
3. Describe the arterial and venous supply to the liver, pancreas, spleen, kidneys, stomach, duodenum, jejunum and ileum of the small intestine, cecum, appendix, ascending, transverse, descending and sigmoid parts of the colon and the rectum.
4. Describe the organization of the parietal and visceral peritoneum, its lesser and greater sacs, mesenteries and peritoneal ligaments.
5. Describe the terms intraperitoneal and retroperitoneal.
6. Summarize the anatomy of the small bowel mesentery, its structure, location and vascular, lymphatic and neural content.
7. Describe the abdominal portion of the sympathetic nervous system and the lumbar plexus.
8. Describe the functional anatomy of the stomach, its position, portions, sphincters, blood and nerve supply and key relations to other abdominal organs.
9. Describe the duodenum, its portions, position, secondary retroperitoneal attachment, blood supply and key relations with other abdominal organs.
10. Describe the regions of the small and large intestine, including the anatomy of the appendix.
11. Describe the position and form of the pancreas and its relationships to other abdominal organs.
12. Describe the position of the liver, the lobes and their key anatomical relations. Explain the peritoneal reflections of the liver. Summarize the anatomy of the portal vein, the portal venous system and portal-systemic anastomosis and its significance.
13. Describe the gall bladder and bile ducts.
14. Describe the position and form of the kidneys and ureters. Demonstrate their relationships to other abdominal and pelvic structures.
15. Describe the relations of the suprarenal (adrenal) glands, their nerve and blood supply.
16. Describe the position (in relation to the ribs) and form of the spleen in relation to its palpation through the abdominal wall. Explain the significance of its anatomical relationships in relation to trauma to the abdomen.
17. Describe the origins, course and major branches of the abdominal aorta, celiac axis, superior and inferior mesenteric arteries, the renal and gonadal arteries. Describe the origins, course and major tributaries of the inferior vena cava.
18. Describe the anatomy of the lymph nodes involved in lymph drainage of abdominal viscera and its significance in relation to spread of malignancy.

19. Interpret standard diagnostic images of the abdomen.

Case

A young man who was thrown from his motorcycle complained of sharp pain on his left side and held his hand over his lower ribs. Radiographic studies revealed fractures of the tenth and eleventh ribs.

Clinicoanatomical Problems

- What abdominal organ was most likely injured?
- Why is this organ so vulnerable to injury?
- Can blunt trauma to other regions of the abdomen injure this organ?
- How is severe hemorrhage from this organ controlled?

For the dissection of the abdomen, you should find:

Arteries

- left and right gastric arteries
- left and right gastroepiploic arteries
- splenic artery
- superior and inferior mesenteric arteries
- arterial arcades
- right, left, middle colic arteries
- marginal artery (of Drummond)
- ileocolic artery
- superior rectal artery
- sigmoid arteries

Other

- stomach
 - cardia
 - fundus
 - body
 - pylorus
 - rugae
- duodenum -first, second, third, fourth parts
- transverse colon
- jejunum
- ileum
- cecum

- vermiform appendix
- ascending, descending, and sigmoid colon
- liver
 - right and left lobes
 - caudate and quadrate lobes
 - gall bladder
- spleen

On the skeleton, you should find:

- bodies of lumbar vertebrae
- last rib
- iliac fossa

LAB 19 – CELIAC TRUNK AND SMA

Date: November 10, 2009

Time: 10:30 AM

Corresponding Lecture: Abdomen II

Lecturer: Frederick Wezeman, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp. 268-309

Objectives pertinent to this dissection:

1. Describe the arterial and venous supply to the liver, pancreas, spleen, kidneys, stomach, duodenum, jejunum and ileum of the small intestine, cecum, appendix, ascending, transverse, descending and sigmoid parts of the colon and the rectum.
2. Describe the organization of the parietal and visceral peritoneum, its lesser and greater sacs, mesenteries and peritoneal ligaments.
3. Summarize the anatomy of the small bowel mesentery, its structure, location and vascular, lymphatic and neural content.
4. Describe the abdominal portion of the sympathetic nervous system and the lumbar plexus.
5. Describe the functional anatomy of the stomach, its position, portions, sphincters, blood and nerve supply and key relations to other abdominal organs.
6. Describe the duodenum, its portions, position, secondary retroperitoneal attachment, blood supply and key relations with other abdominal organs.
7. Describe the position of the liver, the lobes and their key anatomical relations. Explain the peritoneal reflections of the liver. Summarize the anatomy of the portal vein, the portal venous system and portal-systemic anastomosis and its significance.
8. Describe the relations of the suprarenal (adrenal) glands, their nerve and blood supply.
9. Describe the origins, course and major branches of the abdominal aorta, celiac axis, superior and inferior mesenteric arteries, the renal and gonadal arteries. Describe the origins, course and major tributaries of the inferior vena cava.
10. Interpret standard diagnostic images of the abdomen.

Case

A 54-year-old mechanic was admitted to the hospital because of severe epigastric pain and vomiting of blood (*hematemesis*). It was obvious that he had been drinking heavily.

Physical Examination: The blood in his vomitus was bright red. On questioning, the physician learned that the patient had experienced upper GI bleeding on previous occasions (*ruptured esophageal varices*), but never so profusely. The patient's blood pressure was low, and his pulse rate was high. His skin and conjunctivae were slightly yellow (*jaundice*). His eyes appeared to be slightly sunken. *Spider nevi* (branching arterioles) were present in his cheeks, neck, shoulders, and upper limbs. The patient's abdomen was large, fluid-filled (*ascites*), and pendulous. Palpation of the patient's abdomen revealed some enlargement of the liver (*hepatomegaly*) and

spleen *splenomegaly*. Several bluish, dilated varicose veins radiated from his umbilicus *caput medusae*. During a proctoscopic examination, internal hemorrhoids were observed. On questioning, the patient said that he sometimes saw blood in his stools (bowel movements), which were black and shiny.

Diagnosis: Alcoholic cirrhosis of the liver.

Clinicoanatomical Problems

- Discuss anatomically the basis of the man's hematemesis, esophageal varices, hemorrhoids, bloody stools, and caput medusae.
- What is the likely cause of the ascites and splenomegaly?
- Thinking anatomically, how would you suggest that blood pressure in the portal system be reduced?

For the dissection of the abdomen, you should find:

Arteries

- left and right gastric arteries
- left and right gastroepiploic arteries
- splenic artery
- superior and inferior mesenteric arteries
- arterial arcades
- right, left, middle colic arteries
- marginal artery (of Drummond)
- ileocolic artery
- superior rectal artery
- sigmoid arteries

Other

- stomach
 - cardia
 - fundus
 - body
 - pylorus
 - rugae
- duodenum -first, second, third, fourth parts
- transverse colon
- jejunum
- ileum
- cecum
- vermiform appendix

- ascending, descending, and sigmoid colon
- liver
 - right and left lobes
 - caudate and quadrate lobes
 - gall bladder
- spleen

On the skeleton, you should find:

- bodies of lumbar vertebrae
- last rib
- iliac fossa

LAB 20 – INTESTINES AND ABDOMINAL AORTA

Date: November 11, 2009

Time: 3:00 PM

Corresponding Lecture: Abdomen III

Lecturer: Frederick Wezeman, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp. 309-325

Objectives pertinent to this dissection:

1. Describe the arterial and venous supply to the liver, pancreas, spleen, kidneys, stomach, duodenum, jejunum and ileum of the small intestine, cecum, appendix, ascending, transverse, descending and sigmoid parts of the colon and the rectum.
2. Describe the organization of the parietal and visceral peritoneum, its lesser and greater sacs, mesenteries and peritoneal ligaments.
3. Summarize the anatomy of the small bowel mesentery, its structure, location and vascular, lymphatic and neural content.
4. Describe the abdominal portion of the sympathetic nervous system and the lumbar plexus.
5. Describe the functional anatomy of the stomach, its position, portions, sphincters, blood and nerve supply and key relations to other abdominal organs.
6. Describe the duodenum, its portions, position, secondary retroperitoneal attachment, blood supply and key relations with other abdominal organs.
7. Describe the position of the liver, the lobes and their key anatomical relations. Explain the peritoneal reflections of the liver. Summarize the anatomy of the portal vein, the portal venous system and portal-systemic anastomosis and its significance.
8. Describe the relations of the suprarenal (adrenal) glands, their nerve and blood supply.
9. Describe the origins, course and major branches of the abdominal aorta, celiac axis, superior and inferior mesenteric arteries, the renal and gonadal arteries. Describe the origins, course and major tributaries of the inferior vena cava.
10. Interpret standard diagnostic images of the abdomen.

Case

A 55-year old man presents with back pain coupled with constipation and bloody feces.

PHYSICAL EXAMINATION: the physician noted some pain upon applying pressure to the man's umbilical area.

RADIOLOGY REPORT: Ultrasound indicated an abdominal aorta in excess of 15cm and an area of ischemic small bowel.

DIAGNOSIS?

Clinicoanatomical Problems

- What is causing the patient's back pain?
- What brought on the gangrenous bowel?
- What would the treatment be for these two coupled problems?
- What aortic diameter would be of clinical concern?

For the dissection of the abdomen, you should find:

Arteries

- left and right gastric arteries
- left and right gastroepiploic arteries
- splenic artery
- superior and inferior mesenteric arteries
- arterial arcades
- right, left, middle colic arteries
- marginal artery (of Drummond)
- ileocolic artery
- superior rectal artery
- sigmoid arteries

Other

- stomach
 - cardia
 - fundus
 - body
 - pylorus
 - rugae
- duodenum -first, second, third, fourth parts
- transverse colon
- jejunum
- ileum
- cecum
- vermiform appendix
- ascending, descending, and sigmoid colon
- liver
 - right and left lobes
 - caudate and quadrate lobes
 - gall bladder
- spleen

On the skeleton, you should find:

- bodies of lumbar vertebrae
- last rib
- iliac fossa

LAB 21 – POSTERIOR ABDOMINAL WALL

Date: November 12, 2009

Time: 10:30 AM

Corresponding Lecture: Abdomen III

Lecturer: Frederick Wezeman, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp. 309-325

Objectives pertinent to this dissection:

1. Describe the anatomy, innervation and functions of the muscles of the anterior and posterior abdominal walls.
2. Describe the abdominal portion of the sympathetic nervous system and the lumbar plexus.
3. Describe the position and form of the kidneys and ureters. Demonstrate their relationships to other abdominal and pelvic structures.
4. Describe the relations of the suprarenal (adrenal) glands, their nerve and blood supply.
5. Describe the position (in relation to the ribs) and form of the spleen.
6. Describe the position of the pancreas.

Case

On the way home from work, a 42-year-old office worker suddenly experienced a sharp pain in his left side. The pain was so excruciating that he doubled up and moaned in agony. A fellow worker took him to the hospital. When the physician asked him to describe the onset of pain, the patient said that he first felt a slight pain between his ribs and hip bone and that it gradually increased until it was so severe that it brought tears to his eyes. He said that this unbearable pain lasted approximately 30 minutes and then suddenly eased. He explained that the pain comes and goes, but it seemed to be moving toward his groin.

Physical Examination: The physician noted some tenderness and guarding (spasm of the muscles) in the left lower quadrant, but no muscular rigidity. While palpating the tender area deeply, he suddenly removed his hand. Instead of wincing, the patient seemed relieved that the probing had stopped (absence of rebound tenderness). By this time, the patient reported that he felt the pain in his left groin and scrotum and along the medial side of his thigh. The physician noted that the left testis was unusually tender and retracted. When asked to produce a urine sample, the patient stated that it was difficult and painful for him to urinate (*dysuria*). The nurse reported that the patient's urine sample contained blood (*hematuria*). Although the physician was certain that the man was passing a ureteric stone, he ordered an abdominal radiograph of the right kidney, ureter, and urinary bladder.

Radiology Report: Small ureteric stones are visible on the superior right part of the left ureter and in the urinary bladder.

Diagnosis: Ureteric calculi in the left ureter and renal stones in the urinary bladder.

Clinicoanatomical Problems

- What probably caused the patient's initial attack of excruciating pain?
- Based on the anatomy of the ureter, at what other sites is a ureteric calculus likely to become lodged?
- Explain the intermittent exacerbation of pain.
- Briefly discuss the course of pain fibers from the ureters and the referred pain resulting from ureteric trauma.

For the dissection of the posterior abdomen, you should find:

Muscles:

- diaphragm and crura
- quadratus lumborum
- psoas major
- iliacus

Nerves

- subcostal
- iliohypogastric
- ilioinguinal
- lateral femoral cutaneous
- femoral
- lumbar sympathetic trunks
- greater, lesser, and least splanchnics
- obturator
- celiac plexus

Arteries and veins

- abdominal aorta
- inferior vena cava
- inferior phrenic
- suprarenals
- gonadals
- common iliac
- deep circumflex iliac
- renal

Other

- duodenum
 - 4 parts
 - greater duodenal papilla
 - circular folds
- pancreas
 - head, uncinata process, tail
- kidneys
 - cortex
 - medulla (pyramids)
 - major and minor calyces
 - renal pelvis
- ureters
- suprarenal glands
- median, medial, and lateral arcuate ligaments

On the skeleton, you should find:

- transverse processes of lumbar vertebrae
- sacral promontory

For the dissection of the abdomen, you may find:

- ligament of Treitz
- psoas minor m.
- accessory obturator n.
- lumbar arteries and veins
- superior mesenteric ganglia
- aorticorenal ganglia
- cisterna chyli
- superior hypogastric plexus
- right and left hypogastric nerves
- superior and inferior pancreaticoduodenal arteries
- main and accessory pancreatic ducts

LAB 22 – PELVIS / UTERUS

Date: November 16, 2009

Time: 9:30 AM

Corresponding Lecture: Pelvis I

Lecturer: Michael Dauzvardis

Reading Assignments: Clinically Oriented Anatomy, 6th ed., pp. 326-402

Objectives pertinent to this dissection:

1. Describe the bones, ligaments and foramens of the pelvis, and the anatomy of the pelvic inlet and outlet. Identify structures passing through each foramen.
2. Demonstrate the palpable anatomical landmarks of the iliac, ischial and pubic bones.
3. Describe the sacral plexus and its principal branches and the pelvic autonomic nerves.
4. Describe the pelvic floor musculature and the structures passing through it in males and females.
5. Describe the anatomy of the urinary bladder, its base and ureteric openings. Explain how its position changes with filling and its relationship to the overlying peritoneum.
6. Describe the anatomy of the urethra; explain the anatomy of its different parts in males and females.
7. Describe the innervation of the bladder and its sphincters and the mechanism of micturition.
8. Describe the anatomy of the scrotum, testis, epididymis including blood supply and innervation.
9. Describe the structure and course of the spermatic cord and vas deferens.
10. Describe the anatomy of the prostate gland, seminal vesicles and their anatomical relations. Describe the position of the prostate and relationship to the rectum.
11. Describe the position and form of the ovary, uterine tubes, uterus, cervix and vagina and their anatomical relationships, including peritoneal coverings.
12. Describe the origin, course and relations of the uterine, ovarian and testicular arteries and veins.
13. Describe the origin, course and branches of the pudendal nerve.
14. Describe the perineum in the male and female. Explain the anatomy of the urogenital membrane and deep and superficial perineal pouches.
15. Describe the anatomy of the sigmoid colon and rectum and their anatomical relationships and peritoneal coverings. Explain the anatomy of the anal canal and the functional anatomy of the anal sphincters and their innervation.
16. Describe the blood supply and venous drainage of the distal bowel, the arterial supply from the superior, middle, and inferior rectal arteries, and portal-systemic venous anastomosis.
17. Describe the anatomy of the ischio-rectal (ischio-anal) fossa and its contents.
18. Describe the structure of the penis, scrotum and its contents, the clitoris and vulva. Describe the arterial supply to and venous drainage from the penis.
19. Describe the external and internal iliac arteries and the branches of the internal iliac artery.
20. Identify the structures through which a Foley catheter will pass in the male and female.
21. Interpret standard diagnostic images of the pelvis.

Case

A 31-year-old construction worker was walking along a steel beam when he fell, straddling it. He was in severe pain because of trauma to his testes and perineum. Later he observed swelling and discoloration of his scrotum. When he attempted to urinate, only a few drops of bloody urine appeared. He went to a hospital emergency department. After examining the patient, the physician consulted a urologist who ordered radiographic studies of the patient's urethra and bladder. **Radiology Report:** The radiographic studies revealed a rupture of the spongy urethra just inferior to the inferior fascia of the external urethral sphincter and deep transverse perineal muscles. Urethrograms showed passage of contrasting material out of the urethra into the surrounding tissues of the perineum. **Diagnosis:** Rupture of the proximal part of the spongy urethra with extravasation of urine into the surrounding tissues.

Clinicoanatomical Problems

- When the patient tried to urinate, practically no urine came from his external urethral orifice. Where did the urine go?
- Explain why extravasated urine cannot pass posteriorly into the ischioanal fossae, laterally into the thighs, or into the lesser pelvis.

For the dissection of the pelvis, you should find:

Muscles

- iliopsoas
- iliacus
- obturator internus
- levator ani
- piriformis
- coccygeus

Nerves

- femoral nerve
- lumbosacral trunk
- S1,S2,S3,andS4
- pudendal nerve
- obturator nerve

Arteries

- internal iliac

- external iliac
- obliterated umbilical
- superior vesicle
- inferior vesicle
- superior rectal
- middle rectal
- internal pudendal
- iliolumbar
- lateral sacral
- superior gluteal
- inferior gluteal
- obturator
- ovarian

Other

- rectum
- bladder
- prostate
- seminal vesicle
- vas deferens
- corpus spongiosum of penis
- penile urethra
- corpora cavernosa of penis
- ovary
- uterus
- cervix
- anterior, posterior fornices of the vagina
- vagina
- fallopian
- round ligament of uterus
- obturator internus fascia
- pararectal fossa
- paravesical fossa
- rectovesical pouch
- rectouterine pouch
- vesicouterine pouch
- sacrotuberous ligament
- sacrospinus ligament

On the skeleton, you should find:

- sacrum
- coccyx

- ilium
- ischium
- ischial spine
- greater and lesser ischiadic notches
- arcuate line
- obturator foramen
- pubis
- ischiopubic ramus
- pectineal line
- arcuate line

For the dissection of the pelvis, you may find:

- middle sacral vessels
- arcus tendineus
- trigone of bladder
- seminal colliculus
- pelvic nerve plexus
- urethral crest
- prostatic utricle
- orifices of the ejaculatory ducts
- orifices of the ureters
- internal and external anal sphincters
- anal columns
- pectinate line of anus
- uterine artery
- vaginal artery

LAB 23 – HEMISECTION OF THE PELVIS

Date: November 17, 2009

Time: 9:45 AM

Corresponding Lecture: Pelvis II

Lecturer: Michael Dautzvardis, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp. 326-402

Objectives pertinent to this dissection:

1. Describe the bones, ligaments and foramina of the pelvis, and the anatomy of the pelvic inlet and outlet. Identify structures passing through each foramen.
2. Demonstrate the palpable anatomical landmarks of the iliac, ischial and pubic bones.
3. Describe the sacral plexus and its principal branches and the pelvic autonomic nerves.
4. Describe the pelvic floor musculature and the structures passing through it in males and females.
5. Describe the anatomy of the urinary bladder, its base and ureteric openings. Explain how its position changes with filling and its relationship to the overlying peritoneum.
6. Describe the anatomy of the urethra; explain the anatomy of its different parts in males and females.
7. Describe the innervation of the bladder and its sphincters and the mechanism of micturition.
8. Describe the anatomy of the scrotum, testis, epididymis including blood supply and innervation.
9. Describe the structure and course of the spermatic cord and vas deferens.
10. Describe the anatomy of the prostate gland, seminal vesicles and their anatomical relations. Describe the position of the prostate and relationship to the rectum.
11. Describe the position and form of the ovary, uterine tubes, uterus, cervix and vagina and their anatomical relationships, including peritoneal coverings.
12. Describe the origin, course and relations of the uterine, ovarian and testicular arteries and veins.
13. Describe the origin, course and branches of the pudendal nerve.
14. Describe the perineum in the male and female. Explain the anatomy of the urogenital membrane and deep and superficial perineal pouches.
15. Describe the anatomy of the sigmoid colon and rectum and their anatomical relationships and peritoneal coverings. Explain the anatomy of the anal canal and the functional anatomy of the anal sphincters and their innervation.
16. Describe the blood supply and venous drainage of the distal bowel, the arterial supply from the superior, middle, and inferior rectal arteries, and portal-systemic venous anastomosis.
17. Describe the anatomy of the ischio-rectal (ischio-anal) fossa and its contents.
18. Describe the structure of the penis, scrotum and its contents, the clitoris and vulva. Describe the arterial supply to and venous drainage from the penis.

19. Describe the external and internal iliac arteries and the branches of the internal iliac artery.
 20. Identify the structures through which a Foley catheter will pass in the male and female.
 21. Interpret standard diagnostic images of the pelvis.
-

Case

A 28-year-old woman was experiencing pregnancy for the first time (primigravida). Toward the end of the gestational period she suffered painful uterine contractions at night that subsided toward morning (false pains). When she called her physician she told her that her labor was imminent. In a few days she observed a discharge of mucus and some blood. When the patient reported that her “pains” (uterine contractions) were occurring every 10 minutes, her obstetrician asked her to go to the hospital.

Following admission, the physician palpated the patient’s cervix and informed the intern that the external os was open approximately one fingertip and that the patient was still in the first stage of labor (period of dilation of the uterine os). Later a large volume of fluid was expelled (rupture of fetal membranes). When the patient entered the second stage of labor (period of expulsive effort beginning with complete dilation of the cervix and ending with delivery of the baby), she began experiencing considerable pain. Although she had wanted to have a natural birth without the use of anesthetics, she was unable to bear the pain. Medication for pain relief was administered as ordered by her physician.

When it was determined that her contractions were 2 minutes apart and lasting 40 to 60 seconds, she was moved to the case room and placed on a delivery table. As the fetal head dilated the cervix, it was obvious that the woman was suffering intense pain. The obstetrician decided to perform a median episiotomy when it appeared that a tear might occur in the patient’s perineum. She administered an intradermal injection of an anesthetic agent into the patient’s perineum. Although the local anesthetic enabled the incision to be made without pain, it did not alleviate the severe labor pain. The obstetrician decided to perform bilateral pudendal nerve blocks. Thereafter, the patient completed the second stage and proceeded through the third stage of labor (beginning after the delivery of the child and ending with the expulsion of the placenta and fetal membranes).

Clinicoanatomical Problems

- What structures are usually incised during a median episiotomy?
- What is the main structure incised during this procedure and why do you think incision of it might be beneficial?
- Name the structures supplied by the pudendal nerve.
- Based on your knowledge of the anatomy of this nerve, where do you think the obstetrician would inject the anesthetic agent to perform a pudendal block?

- When complete perineal anesthesia is required, branches of what other nerves would have to be blocked?

For the dissection of the pelvis, you should find:

Muscles

- iliopsoas
- iliacus
- obturator internus
- levator ani
- piriformis
- coccygeus

Nerves

- femoral nerve
- lumbosacral trunk
- S1,S2,S3,andS4
- pudendal nerve
- obturator nerve

Arteries

- internal iliac
- external iliac
- obliterated umbilical
- superior vesicle
- inferior vesicle
- superior rectal
- middle rectal
- internal pudendal
- iliolumbar
- lateral sacral
- superior gluteal
- inferior gluteal
- obturator
- ovarian

Other

- rectum
- bladder
- prostate

- seminal vesicle
- vas deferens
- corpus spongiosum of penis
- penile urethra
- corpora cavernosa of penis
- ovary
- uterus
- cervix
- anterior, posterior fornices of the vagina
- vagina
- fallopian
- round ligament of uterus
- obturator internus fascia
- pararectal fossa
- paravesical fossa
- rectovesical pouch
- rectouterine pouch
- vesicouterine pouch
- sacrotuberous ligament
- sacrospinus ligament

On the skeleton, you should find:

- sacrum
- coccyx
- ilium
- ischium
- ischial spine
- greater and lesser ischiadic notches
- arcuate line
- obturator foramen
- pubis
- ischiopubic ramus
- pectineal line
- arcuate line

For the dissection of the pelvis, you may find:

- middle sacral vessels
- arcus tendineus
- trigone of bladder
- seminal colliculus
- pelvic nerve plexus
- urethral crest

- prostatic utricle
- orifices of the ejaculatory ducts
- orifices of the ureters
- internal and external anal sphincters
- anal columns
- pectinate line of anus
- uterine artery
- vaginal artery

For the dissection of the perineum, you should find:

Arteries

- perineal
- inferior rectals
- internal pudendal a. (in pudendal canal)

Nerves

- posterior scrotal
- inferior rectals
- pudendal n. (in pudendal canal)

Muscles

- external anal sphincter
- obturator internus m.
- levator ani m.
- bulbospongiosus
- ischiocavernosus
- sphincter urethra

Other

- ischial tuberosities
- sacrotuberous ligaments
- pubic symphysis
- sacrum/coccyx
- anus

LAB 24 – GLUTEAL REGION / POSTERIOR THIGH

Date: November 18, 2009

Time: 2:00 PM

Corresponding Lecture: Gluteal Region Posterior Thigh

Lecturer: Michael Dausvardis, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp. 512-532; 542-541; 562-583

Objectives pertinent to this dissection:

1. Describe the close relations of the blood vessels, nerves, ligaments and tendons which may be injured in fractures or dislocations at the hip, knee and ankle.
2. Describe the fascia and the compartments they invest for the major muscle groups of the thigh and leg.
3. Demonstrate the origin, course and branches of the major arteries that supply the hip and gluteal region, thigh, leg, ankle and foot. Describe the anastomoses between branches of these arteries at the hip and knee.
4. Demonstrate the course of the principal veins of the lower limb.
5. Describe the origin of the lumbosacral plexus and the formation of its major branches to the lower limb.
6. Describe the origin, course and function of the sciatic, femoral, obturator, common peroneal and tibial nerves, sural and saphenous nerves and summarize the muscles that each supplies as well as their sensory distribution.
7. Describe the structure and movements of the hip joint. Summarize the muscles responsible for these movements, their innervation and main attachments.
8. Describe the structures responsible for stability of the hip joint and their relative contribution to maintaining the lower limb in different positions.
9. Describe the neural and vascular structures at risk from a fracture of the femoral neck or dislocation of the hip.
10. Describe the anatomy of the gluteal region and the course of the sciatic nerve within it.
11. Interpret standard diagnostic images of the lower limb.
12. Recognize the major features and surface landmarks of the femur, tibia, fibula, and bones of the ankle and foot.
13. Identify and describe the muscles of the thigh and leg.
14. Describe the close relations of the blood vessels, nerves, ligaments and tendons which may be injured in fractures or dislocations at the hip, knee and ankle.
15. Describe the fascia and the compartments they invest for the major muscle groups of the thigh and leg.
16. Demonstrate the origin, course and branches of the major arteries that supply the hip and gluteal region, thigh, leg, ankle and foot. Describe the anastomoses between branches of these arteries at the hip and knee.

17. Demonstrate the locations at which the femoral, popliteal, dorsalis pedis and posterior tibial pulses can be felt.
 18. Demonstrate the course of the principal veins of the lower limb.
 19. Describe the origin of the lumbosacral plexus and the formation of its major branches to the lower limb.
 20. Describe the origin, course and function of the sciatic, femoral, obturator, common peroneal and tibial nerves, sural and saphenous nerves and summarize the muscles that each supplies as well as their sensory distribution.
 21. Describe the boundaries and contents of the popliteal fossa.
 22. Describe the anatomy of the ankle joint. Explain the movements of flexion, extension, plantarflexion and dorsiflexion. Summarize the muscles responsible for these movements, their innervation, attachments and blood supply.
 23. Describe the dermatomes of the lower limb.
 24. Interpret standard diagnostic images of the lower limb.
-

Case

A 62-year-old man complained to his family physician about an aching pain in his left buttock that extended along the posterior aspect of his left thigh.

Physical Examination During the examination, the patient pointed to the area where he felt the most pain, which was in the region of the greater sciatic notch. Pain was also elicited by pressure along a line beginning midway between the tip of the greater trochanter of his femur and the ischial tuberosity to the midline of the thigh approximately halfway to the knee. When seated, the patient was unable to extend his left leg fully because of severe pain. With the patient in the supine position, the physician grasped the patient's left ankle and placed his other hand on the anterior aspect of the knee to keep his leg straight. He then slowly raised the left lower limb; when it reached an approximate 75° angle, the man grimaced with pain. Even more pain was elicited when the patient's foot was dorsiflexed. MRIs of the lower back were requested.

Radiology Report - Herniation of the L5/S1 intervertebral disc is visible.

Diagnosis - Herniation of L5/S1 intervertebral disc and compression of the 1st sacral nerve root.

Clinicoanatomical Problems

- what nerve is involved in this case?
- From which segments of the spinal cord does this nerve arise?
- Why does the *straight leg-raising test* elicit pain?
- Why did the pain increase when his foot was dorsiflexed?
- What back lesion probably produced the pain in the buttock and posterior thigh region?
- Thinking anatomically, what other lesions-resulting from disease or injury-do you think might have caused the patient's symptoms?

For the dissection of the gluteus, you should find:

Muscles:

- tensor fascia lata
- gluteus maximus
- gluteus medius
- gluteus minimus
- piriformis
- obturator internus
- superior gemellus
- inferior gemellus
- quadratus femoris

- obturator externus
- biceps femoris
- semitendinosus
- semimembranosus

Nerves

- sciatic
- posterior femoral cutaneous
- inferior gluteal
- superior gluteal
- pudendal
- nerve to obturator internus

- posterior femoral cutaneous
- sciatic nerve
- tibial
- common peroneal

Arteries and veins

- inferior gluteal a.
- superior gluteal a.
- internal pudendal a

- perforating branches of profunda femoris
- small saphenus vein
- long saphenus vein
- posterior tibial a.
- geniculars

Other

- fascia lata
- iliotibial tract
- sacrotuberous ligament
- sacrospinous ligament

- lateral intermuscular septum

On the skeleton, you should find:

- lateral and medial condyles of femur
- greater and lesser trochanters
- intertrochanteric crest and fossa
- gluteal tuberosity on femur
- sacrum
- ischial spine
- ischial tuberosity

- lateral and medial epicondyles
- tibia
 - tuberosity
 - lateral and medial condyles
 - medial malleolus

For the dissection of the gluteus, you may find:

- nerve to obturator internus
- nerve to quadratus femoris and gemellus inferior
- superior, middle, and inferior cluneal nerves

For the dissection of the posterior thigh, you may find:

- posterior femoral cutaneous

LAB 25 – MEDIAL THIGH

Date: November 19, 2009

Time: 9:30 AM

Corresponding Lecture: Anterior and Medial Thigh and Leg

Lecturer: Kathryn Jones, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp. 545-562

Objectives pertinent to this dissection:

1. Recognize the major features and surface landmarks of the femur, tibia, fibula, and bones of the ankle and foot.
2. Identify and describe the muscles of the thigh and leg.
3. Describe the close relations of the blood vessels, nerves, ligaments and tendons which may be injured in fractures or dislocations at the hip, knee and ankle.
4. Describe the fascia and the compartments they invest for the major muscle groups of the thigh and leg.
5. Demonstrate the origin, course and branches of the major arteries that supply the hip and gluteal region, thigh, leg, ankle and foot. Describe the anastomoses between branches of these arteries at the hip and knee.
6. Demonstrate the locations at which the femoral, popliteal, dorsalis pedis and posterior tibial pulses can be felt.
7. Demonstrate the course of the principal veins of the lower limb.
8. Describe the origin of the lumbosacral plexus and the formation of its major branches to the lower limb.
9. Describe the origin, course and function of the sciatic, femoral, obturator, common peroneal and tibial nerves, sural and saphenous nerves and summarize the muscles that each supplies as well as their sensory distribution.
10. Describe the structure and movements of the hip joint. Summarize the muscles responsible for these movements, their innervation and main attachments.
11. Describe the structures responsible for stability of the hip joint and their relative contribution to maintaining the lower limb in different positions.
12. Describe the neural and vascular structures at risk from a fracture of the femoral neck or dislocation of the hip.
13. Describe the boundaries of the femoral triangle and the anatomical relationships of the femoral nerve, artery, vein and lymph nodes to each other and to the inguinal ligament.
14. Describe the anatomy of the gluteal region and the course of the sciatic nerve within it.
15. Describe the structure and movements of the knee joint. Summarize the muscles responsible for these movements, their innervations and attachments.
16. Describe the menisci and knee ligaments.

17. Describe the boundaries and contents of the popliteal fossa.
 18. Describe the anatomy of the ankle joint. Explain the movements of flexion, extension, plantarflexion and dorsiflexion. Summarize the muscles responsible for these movements, their innervation, attachments and blood supply.
 19. Describe the major ligaments responsible for stability of the ankle joint.
 20. Describe the arches of the foot and the ligaments and muscles that maintain them.
 21. Describe the movements of inversion and eversion at the ankle, the muscles responsible, their innervation, blood supply and main attachments.
 22. Describe the intrinsic muscles of the foot, their nerve and vascular supply.
 23. Describe the dermatomes of the lower limb.
 24. Interpret standard diagnostic images of the lower limb.
-

Case

A young man received a superficial slash wound on the superomedial side of his knee. A rounded cord-like tendon, palpable in this position in the contralateral limb, is no longer palpable.

Clinicoanatomical Problems

- Which tendon was most likely severed?
- How is this tendon related to others?
- How can the muscle to which this tendon belongs be tested during a physical examination?

For the dissection of the anterior thigh, you should find:

Muscles

- tensor fascia lata
- sartorius
- rectus femoris
- vastus medialis
- vastus intermedius
- vastus lateralis
- iliopsoas
- pectineus
- adductor longus
- adductor magnus
- adductor brevis
- gracilis
- obturator externus

Nerves

- lateral femoral cutaneous
- saphenous
- femoral
- anterior and posterior divisions of the obturator

Arteries and veins

- great saphenous v.
- femoral a.
- profunda femoral a.
- lateral femoral circumflex a.
- medial femoral circumflex a.

Other

- inguinal ligament
- fascia lata
- iliotibial tract
- intermuscular septum
- femoral sheath
- femoral canal

On the skeleton, you should find:

- lateral and medial condyles of femur
- greater and lesser trochanters
- anterior superior and inferior iliac spines
- pubic symphysis
- superior and inferior pubic rami
- adductor tubercle
- patella
- linea aspera

For the dissection of the anterior thigh, you may find:

- lateral femoral cutaneous nerves
- anterior femoral cutaneous nerves
- femoral branch genitofemoral nerve
- ascending and transverse branches of medial femoral circumflex a.
- ascending and transverse branches of lateral femoral circumflex a.
- perforating arteries
- anterior and posterior branches of obturator a.

LAB 26 – LEG AND KNEE

Date: November 20, 2009

Time: 11:30 AM

Corresponding Lecture: Leg and Foot

Lecturer: Kathryn Jones, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp. 584-626; 626-669

Objectives pertinent to this dissection:

1. Recognize the major features and surface landmarks of the femur, tibia, fibula, and bones of the ankle and foot.
2. Identify and describe the muscles of the thigh and leg.
3. Describe the close relations of the blood vessels, nerves, ligaments and tendons which may be injured in fractures or dislocations at the hip, knee and ankle.
4. Describe the fascia and the compartments they invest for the major muscle groups of the thigh and leg.
5. Demonstrate the origin, course and branches of the major arteries that supply the hip and gluteal region, thigh, leg, ankle and foot. Describe the anastomoses between branches of these arteries at the hip and knee.
6. Demonstrate the locations at which the femoral, popliteal, dorsalis pedis and posterior tibial pulses can be felt.
7. Demonstrate the course of the principal veins of the lower limb.
8. Describe the origin of the lumbosacral plexus and the formation of its major branches to the lower limb.
9. Describe the origin, course and function of the sciatic, femoral, obturator, common peroneal and tibial nerves, sural and saphenous nerves and summarize the muscles that each supplies as well as their sensory distribution.
10. Describe the structure and movements of the knee joint. Summarize the muscles responsible for these movements, their innervations and attachments.
11. Describe the menisci and knee ligaments.
12. Describe the boundaries and contents of the popliteal fossa.
13. Describe the dermatomes of the lower limb.
14. Interpret standard diagnostic images of the lower limb.

Case

During a football game, a linebacker illegally blocked a 20-year-old wide receiver by throwing himself against the posterolateral aspect of the runner's legs. The receiver grasped his knee and was in obvious pain.

Clinicoanatomical Problems

- What injury can occur from a block against the posterolateral aspect of the knee if the foot is planted on the ground?
- In what other sport does this knee injury frequently occur?
- What is the mechanism of the knee injury?

For the dissection of the leg, you should find:

Muscles

- gastrocnemius
- soleus
- plantaris
- flexor hallucis longus
- flexor digitorum longus
- tibialis posterior
- popliteus
- peroneus longus
- peroneus brevis
- peroneus tertius
- tibialis anterior
- extensor digitorum longus
- extensor hallucis longus

Nerves

- posterior femoral cutaneous
- medial sural cutaneous
- lateral sural cutaneous
- saphenous
- sciatic nerve
- tibial
- common peroneal
- superficial peroneal
- deep peroneal

Arteries and veins

- perforating branches of profunda femoris
- small saphenous vein
- long saphenous vein
- posterior tibial a.
- peroneal a.

- popliteal a.
- anterior tibial a.
- dorsalis pedis a.
- geniculars

Other

- lateral intermuscular septum
- interosseous membrane
- flexor retinaculum

On the skeleton, you should find:

- lateral and medial epicondyles
- tibia
 - tuberosity
 - lateral and medial condyles
 - medial malleolus
- fibula
 - head
 - lateral malleolus

For the dissection of the posterior thigh and leg, you may find:

- peroneal communicating nerve
- sural nerve

LAB 27 – FOOT

Date: November 23, 2009

Time: 9:30 AM

Corresponding Lecture: Leg and Foot

Lecturer: Kathryn Jones, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp. 584-626; 626-669

Objectives pertinent to this dissection:

1. Recognize the major features and surface landmarks of the femur, tibia, fibula, and bones of the ankle and foot.
2. Demonstrate the origin, course and branches of the major arteries that supply the hip and gluteal region, thigh, leg, ankle and foot. Describe the anastomoses between branches of these arteries at the hip and knee.
3. Demonstrate the locations at which the femoral, popliteal, dorsalis pedis and posterior tibial pulses can be felt.
4. Demonstrate the course of the principal veins of the lower limb.
5. Describe the origin of the lumbosacral plexus and the formation of its major branches to the lower limb.
6. Describe the anatomy of the ankle joint. Explain the movements of flexion, extension, plantarflexion and dorsiflexion. Summarize the muscles responsible for these movements, their innervation, attachments and blood supply.
7. Describe the major ligaments responsible for stability of the ankle joint.
8. Describe the arches of the foot and the ligaments and muscles that maintain them.
9. Describe the movements of inversion and eversion at the ankle, the muscles responsible, their innervation, blood supply and main attachments.
10. Describe the intrinsic muscles of the foot, their nerve and vascular supply.
11. Describe the dermatomes of the lower limb.
12. Interpret standard diagnostic images of the lower limb.

Case

A young woman injured her ankle during a basketball game. She said, "I turned my ankle in but it's only a slight sprain!" An examination by the trainer indicated that she had a severely sprained ankle.

Clinicoanatomical Problems

- What ankle ligament did she most likely tear?
- What other ligaments may have been torn?
- What bone might she have fractured?

For the dissection of the foot, you should find:

Muscles

- extensor digitorum brevis
- extensor hallucis brevis
- peroneus tertius
- abductor digiti minimi
- flexor digitorum brevis
- flexor hallucis longus tendon
- flexor digitorum longus tendon
- quadratus plantae
- lumbricals
- abductor hallucis
- flexor hallucis brevis
- flexor digiti minimi brevis
- adductor hallucis (transverse and oblique heads)
- dorsal interossei
- plantar interossei

Nerves

- medial plantar
- lateral plantar
- superficial peroneal
- deep peroneal
- sural

Arteries

- dorsalis pedis
- deep plantar
- medial and lateral plantar arteries

Other

- plantar aponeurosis
- inferior and superior extensor retinaculi
- flexor retinaculi
- long plantar ligament
- plantar calcaneonavicular (spring) ligament

On the skeleton, you should find:

- calcaneus
- talus
- cuboid
- cuneiforms
- metatarsals
- navicular
- tarsals

For the dissection of the foot, you may find:

- common plantar digital arteries
- proper plantar digital arteries
- arcuate artery
- lateral and medial tarsal arteries
- deep plantar arch
- common plantar digital nerves
- proper plantar digital nerves
- dorsal digital arteries
- dorsal metatarsal arteries

LAB 28 – SKULL AND CRANIAL CAVITY

Date: November 30, 2009

Time: 9:30 AM

Corresponding Lecture: Cranium and Cranial Nerves

Lecturer: Kathryn Jones, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp.822-843; 1053-1078

***** Since this is a short lab, please use the remainder of your time to do a mid-course clean up of your station.**

Objectives pertinent to this dissection:

1. Describe the boundaries, walls and floors of the cranial fossae.
2. Identify the external and internal features of the cranial foraminae and list the structures that each transmits.
3. Describe the origin, function and major branches of the sensory and motor components of the trigeminal nerve and their pathways.
4. Identify the contents (brain) of the anterior, middle and posterior cranial fossae.
5. Describe the major sutures of the skull and name their points of articulation.
6. Interpret standard diagnostic images of the head and neck.

Clinical Case

A 68-year-old man who had a severe cold became acutely ill about two weeks later. His wife consulted their family physician, who said to bring him to his office as soon as possible. During her examination the physician noted that he had a high fever, pain in his eyeballs, a severe headache, paranasal sinusitis, no pupillary reflex, and dilation of the pupil. She also noted that his right eyeball was abducted and directed slightly inferiorly. Which of the following statements best describes the most likely cause of the man's symptoms and signs?

- Cavernous sinus thrombophlebitis involving the oculomotor nerve (CN III).
- Thrombophlebitis of the cavernous sinus involving the trochlear nerve (CN IV).
- Injury to the abducent nerve (CN VI) in the cavernous sinus.
- Obstruction of blood flow through the ophthalmic and central retinal veins.

For the dissection of the cranium, you should find:

Nerves (find the hole or foramen that these nerves pass through)

- optic nerve
- oculomotor nerve
- trigeminal nerve
 - trigeminal (semilunar) ganglion
 - ophthalmic division
 - maxillary division
 - mandibular division
- facial nerve
- vestibulocochlear nerve
- glossopharyngeal nerve
- vagus nerve
- spinal accessory nerve
- hypoglossal nerve

In addition, find the following bones and their parts:

- ethmoid and crista galli
- anterior, middle, posterior cranial fossae
- foramina
 - optic foramen
 - foramen rotundum
 - foramen ovale
 - foramen spinosum
 - superior orbital fissure
 - internal auditory meatus
 - jugular foramen
 - foramen magnum
 - hypoglossal canal

LAB 29 – DISSECTION OF SKULL BASE

Date: December 1, 2009

Time: 9:30 AM

Corresponding Lecture: Cranium and Cranial Nerves

Lecturer: Kathryn Jones, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp.822-843; 1053-1078

Objectives pertinent to this dissection:

1. Demonstrate the position, palpable and imaging landmarks of the major bones of the skull. Demonstrate the palpable position of the hyoid bone, thyroid and cricoid cartilages, lateral mass of the atlas and the spine of C7.
2. Describe the boundaries, walls and floors of the cranial fossae.
3. Identify the external and internal features of the cranial foraminae and list the structures that each transmits.
4. Demonstrate the origin, course and branches of the external carotid artery and locate the carotid pulse.
5. Describe the courses of the vagus and phrenic nerves from their origins to the thoracic outlet.
6. Describe the intracranial and intrapetrous course of the facial nerve and the relationships of its major branches to the middle ear in relation to damage of the nerve within the facial canal.
7. Describe the origin, function and major branches of the sensory and motor components of the trigeminal nerve and their pathways.
8. Describe the origins and summarize the courses, major branches and pathways of the facial and maxillary arteries, including the course and intracranial relations of the middle meningeal artery and its significance in extradural hemorrhage..
9. Describe the muscles that compose the pharyngeal walls and move the soft palate; summarize their functions and nerve supply.
10. Describe the arrangement of the dura mater, and its main reflections within the cranial cavity and their relationship to the major venous sinuses and the brain itself.
11. Describe the arrangement of the venous sinuses of the cranial cavity; explain the entrance of cerebral veins into the superior sagittal sinus in relation to subdural haemorrhage, and how connections between sinuses and extracranial veins may permit intracranial infection
12. Identify the contents (brain) of the anterior, middle and posterior cranial fossae.
13. Describe the major sutures of the skull and name their points of articulation.
14. Interpret standard diagnostic images of the head and neck.

Case

During batting practice, a ball was foul-tipped and struck the left side of the head of a player standing nearby. He fell to the ground and was unconscious for more than 3 minutes. The initial examination by the trainer revealed that the skin was not broken, but there was swelling in the

temporal fossa. The player complained of an intense headache, disorientation, and blurred vision; his left pupil was moderately dilated and reacted sluggishly to light.

Clinicoanatomical Problems

- Which of the signs mentioned above indicate a possible cranial fracture and extradural (epidural) hematoma?
- What arterial branch was most likely torn? Where is it located? What type of cranial fracture is likely present? Where would the blood accumulate?
- If you were present at the time of injury and noted the above signs, what would you do?
- How do you think the neurosurgeon might remove the hematoma?

For the dissection of the cranium, you should find:

Nerves

- optic nerve
- oculomotor nerve
- trigeminal nerve
 - trigeminal (semilunar) ganglion
 - ophthalmic division
 - maxillary division
 - mandibular division
- facial nerve
- vestibulocochlear nerve
- glossopharyngeal nerve
- vagus nerve
- spinal accessory nerve
- hypoglossal nerve

Arteries and veins

- internal carotid artery
- vertebral artery
- middle meningeal artery

Other

- transverse sinus
- sigmoid sinus
- confluens of sinuses
- cavernous sinuses
- falx cerebri
- tentorium cerebelli

- falx cerebelli
- diaphragma sellae
- pituitary gland

In addition, find the following bones and their parts:

- ethmoid and crista galli
- anterior, middle, posterior cranial fossae
- foramina
 - optic foramen
 - foramen rotundum
 - foramen ovale
 - foramen spinosum
 - superior orbital fissure
 - internal auditory meatus
 - jugular foramen
 - foramen magnum
 - hypoglossal canal

For the dissection of the cranium, you may find:

- superior sagittal sinus
- superior and inferior petrosal sinuses
- basilar artery
- trochlear nerve
- greater petrosal nerve (hiatus)

LAB 30 – EYE AND ORBIT

Date: December 2, 2009

Time: 2:00 PM

Corresponding Lecture: Orbit

Lecturer: John Santaniello, MD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp. 889-914

Objectives pertinent to this dissection:

1. Describe the origin, function and major branches of the sensory and motor components of the trigeminal nerve and their pathways.
 2. Describe the location, actions and nerve supply of the intrinsic and extra-ocular muscles.
 3. Describe the anatomy of the eyelids, conjunctiva and lacrimal glands.
 4. Interpret standard diagnostic images of the head and neck.
-

Case

A 26-year-old man was examined in the emergency department after being hit in the eye with a pool cue during a brawl. Examination of the eyeball showed no serious injury except for bleeding into the anterior chamber. The physician was concerned about the appearance of the eyeball and referred the patient to an ophthalmologist.

Clinicoanatomical Problems

- What type of orbital fracture may have occurred?
- How do you think a nonpenetrating blow to the eye could result in serious problems?

For the dissection of the orbit, you should find:

Muscles

- levator palpebrae superioris
- superior rectus
- lateral rectus
- superior oblique
- medial rectus
- inferior rectus
- inferior oblique

Nerves

- frontal
- supraorbital
- supratrochlear
- nasociliary
- lacrimal nerve
- trochlear
- abducens
- optic

Arteries

- ophthalmic
- lacrimal

Other

- lacrimal gland

In addition: find the following bones and their parts:

- frontal
- maxilla
- sphenoid
- lacrimal
- ethmoid
- zygomatic

For the dissection of the orbit, you may find:

- anterior and posterior ethmoidal arteries and nerves
- superior division of oculomotor n.
- inferior division of oculomotor n.
- long ciliary nerves
- ciliary ganglion
- short ciliary nerves
- central artery of the retina

LAB 31 – NECK

Date: December 3, 2009

Time: 9:30 AM

Corresponding Lecture: Anterior Neck, Root of Neck

Lecturer: John McNulty, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp. 985-992; 999-1018

Objectives pertinent to this dissection:

1. Demonstrate the position, palpable and imaging landmarks of the major bones of the skull. Demonstrate the palpable position of the hyoid bone, thyroid and cricoid cartilages, lateral mass of the atlas and the spine of C7.
2. Identify the boundaries of the triangles of the neck and list their contents.
3. In the posterior triangle, demonstrate the route of the spinal accessory nerve, the roots and trunks of the brachial plexus, the external jugular vein and subclavian vessels.
4. In the anterior triangle, demonstrate the position of the common, internal and external carotid arteries, the internal jugular vein and vagus nerve, the trachea, thyroid cartilage, larynx, thyroid and parathyroid glands.
5. Describe the location and anatomical relations of the thyroid and parathyroid glands, their blood supply and the significance of the courses of the laryngeal nerves.
6. Demonstrate the origin, course and branches of the external carotid artery and locate the carotid pulse.
7. Describe the courses of the vagus and phrenic nerves from their origins to the thoracic outlet.
8. Identify the major structures passing between the neck and the thorax. Describe the courses and important relationships of the subclavian arteries and veins.
9. Describe the hyoid bone and cartilages of the larynx.
10. Describe the intrinsic and extrinsic laryngeal muscles responsible for closing the laryngeal inlet, controlling vocal cord position and tension.
11. Describe the origin, course and functions of the motor and sensory nerve supply of the larynx.
12. Describe the fascia of the muscular and visceral portions of the neck.
13. Describe the relationship of the scalene muscles to the subclavian artery and vein and the course of the phrenic nerve and roots of the brachial plexus.
14. Demonstrate the positions of the external and internal jugular veins and the surface landmarks that are used when inserting a central venous line.
15. Describe the arrangement of the lymphatic drainage of the head and neck and the major groups of lymph nodes.
16. Interpret standard diagnostic images of the head and neck.

Case

A 58-year-old woman consulted with her physician about a slight swelling in her neck, inferior to her thyroid cartilage. Physical examination and ultrasound scanning revealed several thyroid nodules in the right lobe of her thyroid gland. Further examination of cells obtained by fine-needle aspiration revealed that the hypercellular aspirate was suspicious for malignancy. It was decided to perform a hemithyroidectomy. An endotracheal airway was inserted through the mouth before beginning the surgery. The patient's throat was sore for approximately 2 days, and her voice was hoarse.

Clinicoanatomical Problems

- Explain what is meant by a hemithyroidectomy?
- What do you think caused her sore throat?
- What was the likely cause of her hoarseness?
- During thyroid surgery, what nerves are vulnerable to injury?
- What structures would be affected by injury to these nerves?

For the dissection of the neck, you should find:

Muscles

- platysma
- sternocleidomastoid
- sternothyroid
- sternohyoid
- thyrohyoid
- omohyoid
- cricothyroid
- digastric
- stylohyoid
- mylohyoid
- hyoglossus
- anterior scalene

Nerves

- great auricular
- hypoglossal (C.N. XII)
- internal branch of superior laryngeal
- ansa cervicales
- lingual

- phrenic
- vagus
- recurrent laryngeal

Arteries

- superior thyroid
- common carotid
- external carotid
- internal carotid
- superior laryngeal
- lingual
- facial
- thyrocervical trunk
- transverse cervical
- suprascapular
- inferior thyroid
- ascending cervical
- vertebral
- internal thoracic
- costocervical trunk

Other

- external jugular vein
- internal jugular vein
- thyroid gland
- submandibular gland and duct
- retromandibular vein

In addition: find the following bony parts:

- hyoid bone
- thyroid cartilage
- cricoid cartilage
- mandible

For the dissection of the neck, you may find:

- transverse cervical (colli) nerve
- cervical branch of C.N. VII to the platysma
- external branch of superior laryngeal nerve
- submental artery
- suprahyoid artery

- nerve to mylohyoid muscle
- ansa subclavius
- deep cervical artery
- superior intercostal artery
- ascending pharyngeal artery
- posterior auricular artery
- submandibular ganglion

LAB 32 – SUPERFICIAL AND DEEP FACE

Date: December 4, 2009

Time: 10:30 AM

Corresponding Lecture: Face and Infratemporal Fossa

Lecturer: John McNulty, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp. 914-953; 954-965

Objectives pertinent to this dissection:

1. Demonstrate the position, palpable and imaging landmarks of the major bones of the skull. Demonstrate the palpable position of the hyoid bone, thyroid and cricoid cartilages, lateral mass of the atlas and the spine of C7.
2. Describe the anatomy of the scalp, naming its layers and blood supply.
3. Demonstrate the extracranial course of the branches of the facial nerve.
4. Describe the anatomy of the temporo-mandibular joint. Explain the movements of the mandible and describe the muscles involved including their innervation.
5. Describe the origin, function and major branches of the sensory and motor components of the trigeminal nerve and their pathways.
6. Describe the origins and summarize the courses, major branches and pathways of the facial and maxillary arteries, including the course and intracranial relations of the middle meningeal artery and its significance in extradural hemorrhage.
7. Describe the infratemporal fossa and pterygopalatine fissure and their contents.
8. Describe the key anatomical relations of the parotid, submandibular and sublingual salivary glands, the course of their ducts into the oral cavity and their autonomic secretomotor innervation.
9. Describe the bones of the nasal cavity and the major features of the lateral wall of the nasal cavity. Describe the major arteries and nerves that supply the lateral wall and nasal septum.
10. Name the paranasal sinuses, describe their relationships to the nasal cavities and sites of drainage on its lateral wall and explain their innervation.
11. Interpret standard diagnostic images of the head and neck.

Case

A 62-year-old man complained to his dentist about sudden recurring attacks of excruciating, stabbing pain (*paroxysms*) on the left side of his face. They were of approximately two months' duration and had been increasing in severity. Following examination, the dentist informed him that there was no dental cause for his pain. He recommended that he see a physician. **Physical Examination:** The man told the physician that the stabbing pains, lasting 15 to 20 seconds, occurred several times a day and were so severe that he had once contemplated suicide. He said that the onset of pain seemed to be triggered by chewing and a cold wind blowing on his face.

When the physician asked him to point to the area where the pains occurred, he pointed to his left upper lip and cheek. He said the pain also radiated to his inferior eyelid, the lateral side of his nose, and the inside of his mouth. The physician applied firm, steady pressure over the person's left cheek and over his infraorbital area. He detected no tenderness indicative of inflammation of the maxillary sinus. On further evaluation, the physician detected acute sensitivity to touch (*hyperesthesia*) on the left upper lip and over the entire left maxillary region, but found no abnormality of sensation in the forehead or mandibular regions. **Diagnosis:** Tic douloureux.

Clinicoanatomical Problems

- Which branch of what major nerve supplies the area of skin and mucous membrane where the paroxysms were felt?
- Where does the maxillary nerve leave the cranium?
- What are the maxillary nerve's branches and how are they distributed?

For the dissection of the face, you should find:

Muscles

- orbicularis oculi
- orbicularis oris
- frontalis
- zygomaticus major
- nasalis
- risorius
- mentalis
- masseter
- temporalis
- lateral pterygoid
- medial pterygoid

Nerves

- facial (C.N. VII) and as many of its branches as you can find
- auriculotemporal
- supraorbital
- infraorbital
- mental
- lingual
- inferior alveolar
- auriculotemporal
- chorda tympani

Arteries

- facial
 - inferior labial
 - superior labial
 - angular
- superficial temporal
- maxillary
 - deep temporals
 - inferior alveolar
 - middle meningeal
 - posterior superior alveolar

Other

- parotid gland and duct
- retromandibular vein
- buccal fat pad

In addition: find the following bones and their parts:

- zygomatic
- maxillary
- frontal
- mandible
- temporal

For the dissection of the face, you may find:

Nerves

- supratrochlear nerve
- zygomaticofacial nerve
- zygomaticotemporal nerve
- infratrochlear nerve
- buccal branch of mandibular nerve

Arteries

- transverse facial artery

LAB 33 – PHARYNX AND LARYNX

Date: December 7, 2009

Time: 9:30 AM

Corresponding Lecture: Pharynx and Larynx

Lecturer: Michael Dausvardis, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp. 1018-1052

Objectives pertinent to this dissection:

1. Demonstrate the position, palpable and imaging landmarks of the major bones of the skull. Demonstrate the palpable position of the hyoid bone, thyroid and cricoid cartilages, lateral mass of the atlas and the spine of C7.
2. Demonstrate the origin, course and branches of the external carotid artery and locate the carotid pulse.
3. Describe the courses of the vagus and phrenic nerves from their origins to the thoracic outlet.
4. Identify the major structures passing between the neck and the thorax. Describe the courses and important relationships of the subclavian arteries and veins.
5. Describe the anatomical arrangement and functional significance of the lymphoid tissue in the tonsils, pharyngeal, and posterior nasal walls.
6. Describe the muscles that compose the pharyngeal walls and move the soft palate; summarize their functions and nerve supply.
7. Describe the hyoid bone and cartilages of the larynx.
8. Describe the intrinsic and extrinsic laryngeal muscles responsible for closing the laryngeal inlet, controlling vocal cord position and tension.
9. Describe the origin, course and functions of the motor and sensory nerve supply of the larynx.
10. Describe the fascia of the muscular and visceral portions of the neck.
11. Describe the relationship of the scalene muscles to the subclavian artery and vein and the course of the phrenic nerve and roots of the brachial plexus.
12. Demonstrate the positions of the external and internal jugular veins and the surface landmarks that are used when inserting a central venous line.
13. Describe the arrangement of the lymphatic drainage of the head and neck and the major groups of lymph nodes
14. Interpret standard diagnostic images of the head and neck.

Case

During an automobile accident, the neck of an 82-year-old man was injured by the safety belt as the vehicle stopped suddenly. He complained of difficult breathing and a sore "Adam's apple."

The physician who examined him realized that it was necessary to perform an emergency *cricothyroidotomy* to secure an adequate airway.

Clinicoanatomical Problems

- What structures in the anterior part of the neck were most likely injured by the safety belt during the automobile accident? How could this cause difficult breathing?
- What surgical procedure do you think would be performed to support an airway over an extended period of time?
- What structure is incised to enter the trachea during a cricothyroidotomy?
- Why is the laryngeal skeleton more easily fractured in elderly people?
- Based on your knowledge of the relations of the trachea, what structures may be injured during this procedure?

For the dissection of the face, you may find:

Nerves

- supratrochlear nerve
- zygomaticofacial nerve
- zygomaticotemporal nerve
- infratrochlear nerve
- buccal branch of mandibular nerve

Arteries:

- transverse facial artery

For the dissection of the pharynx, you may find:

- rectus capitis anterioris m.
- rectus capitis lateralis m.
- longus capitis m.
- pharyngeal plexus
- ascending pharyngeal artery
- cricopharyngeus m.
- pharyngeal tonsil
- ascending pharyngeal artery

For the dissection of the larynx, you should find:

Muscles

- cricothyroid
- posterior cricoarytenoid
- transverse and oblique arytenoid
- aryepiglotticus
- lateral cricoarytenoid
- thyroarytenoid
- vocalis

Nerves

- internal laryngeal
- external laryngeal
- recurrent laryngeal
- inferior laryngeal

Arteries

- superior laryngeal

Other

- vocal ligament
- true and false vocal cords
- rima glottidis
- thyrohyoid membrane

You should find these cartilages

- thyroid
- cricoid
- arytenoid
- corniculate
- cuneiform

LAB 34 – FINISH PHARYNX AND LARYNX

Date: December 8, 2009

Time: 9:30 AM

Corresponding Lecture: Pharynx and Larynx

Lecturer: Michael Dausvardis, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., pp. 1018-1052

Objectives pertinent to this dissection:

1. Demonstrate the position, palpable and imaging landmarks of the major bones of the skull. Demonstrate the palpable position of the hyoid bone, thyroid and cricoid cartilages, lateral mass of the atlas and the spine of C7.
2. Demonstrate the origin, course and branches of the external carotid artery and locate the carotid pulse.
3. Describe the courses of the vagus and phrenic nerves from their origins to the thoracic outlet.
4. Identify the major structures passing between the neck and the thorax. Describe the courses and important relationships of the subclavian arteries and veins.
5. Describe the anatomical arrangement and functional significance of the lymphoid tissue in the tonsils, pharyngeal, and posterior nasal walls.
6. Describe the muscles that compose the pharyngeal walls and move the soft palate; summarize their functions and nerve supply.
7. Describe the hyoid bone and cartilages of the larynx.
8. Describe the intrinsic and extrinsic laryngeal muscles responsible for closing the laryngeal inlet, controlling vocal cord position and tension.
9. Describe the origin, course and functions of the motor and sensory nerve supply of the larynx.
10. Describe the fascia of the muscular and visceral portions of the neck.
11. Describe the relationship of the scalene muscles to the subclavian artery and vein and the course of the phrenic nerve and roots of the brachial plexus.
12. Demonstrate the positions of the external and internal jugular veins and the surface landmarks that are used when inserting a central venous line.
13. Describe the arrangement of the lymphatic drainage of the head and neck and the major groups of lymph nodes.
14. Interpret standard diagnostic images of the head and neck.

Case

After completing your first anatomy examination, your father decided to celebrate and take you out for a steak dinner. After a few drinks you noted that he was eating his steak rapidly and that his speech was slurred. Later you noticed your father's face change suddenly. He had a terrified look and then collapsed on the floor. At first you suspected that he had passed out, but as you

examined him more closely you thought that perhaps he was having a stroke, a heart attack, or a seizure. Your examination also revealed that his pulse was strong, but his face began to turn blue. You then realized that your father was suffering from *asphyxia*. You opened his mouth widely and observed a large piece of steak caught in the posterior part of his throat. First you reached into his mouth with your index finger and tried to pull it out. On being unsuccessful, you rolled him into the prone position and performed the *Heimlich maneuver*. This increased his intraabdominal pressure and moved his diaphragm superiorly, forcing the air out of his lungs and expelling the piece of steak.

Clinicoanatomical Problems

- Where was the piece of steak most likely lodged?
- Discuss the common causes of laryngeal obstruction.
- If the Heimlich maneuver had not been successful and a physician had come to help you, what lifesaving measures do you think he or she might have taken?

LAB 35 – ORAL AND NASAL CAVITIES

Date: December 9, 2009

Time: 2:15 PM

Corresponding Lecture: Oral and Nasal Cavities

Lecturer: John McNulty, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., 956-965; 954-965

Objectives pertinent to this dissection:

1. Describe the infratemporal fossa and pterygopalatine fissure and their contents.
2. Describe the key anatomical relations of the parotid, submandibular and sublingual salivary glands, the course of their ducts into the oral cavity and their autonomic secretomotor innervation.
3. Describe the functional anatomy of the tongue, including its motor and sensory innervation and the role of the extrinsic and intrinsic muscles. Explain the deviation of the tongue after hypoglossal nerve injuries.
4. Describe the anatomical arrangement and functional significance of the lymphoid tissue in the tonsils, pharyngeal, and posterior nasal walls.
5. Describe the bones of the nasal cavity and the major features of the lateral wall of the nasal cavity. Describe the major arteries and nerves that supply the lateral wall and nasal septum.
6. Name the paranasal sinuses, describe their relationships to the nasal cavities and sites of drainage on its lateral wall and explain their innervation.
7. Interpret standard diagnostic images of the head and neck.

Case

A shortstop fielding a ground ball was hit on the side of the nose when the ball bounced unexpectedly. Blood spurted from his nose and his nasal airway was obstructed. His nose was deformed and the nasal bones were displaced. Disruption of the nasal cartilages was also detected.

Clinicoanatomical Problems

- What is epistaxis?
- What causes spurting of blood from the nose? What specific structures are involved?
- What causes obstruction to the nasal airway?
- If the nasal fracture extends into the cranium, what may be the result?

For the dissection of the nasal cavity, you should find:

Muscles

- salpingopharyngeus
- tensor vel palatini
- levator veli palatini
- palatoglossus
- palatopharyngeus

Nerves

- pterygopalatine ganglion
- greater and lesser palatine nerves

Arteries

- infraorbital artery
- descending palatine artery

Other

- choana
- sphenoethmoidal recess
- superior, middle, and inferior conchae
- superior, middle, and inferior meati
- torus tubarius
- infundibulum
- hiatus semilunaris
- nasolacrimal duct

On the skeleton, you should find:

- pterygoid plates and hamulus
- vomer
- inferior meatus

For the dissection of the nasal cavity, you may find:

- zygomatic nerve
- posterior superior alveolar nerve
- nasopalatine nerve
- pharyngeal nerve
- vidian nerve
- greater, lesser, and deep petrosal nerves
- hiatus semilunaris
- opening of nasolacrimal duct
- branches of the anterior ethmoidal nerve

- branches of the nasocilliary nerve
- ethmoidal bulla
- sphenopalatine artery

For the dissection of the oral cavity, you should find:

Muscles

- hyoglossus
- styloglossus
- genioglossus
- geniohyoid
- mylohyoid
- uvulae

Nerves

- lingual
- hypoglossal nerve
- glossopharyngeal

Arteries

- lingual

Other

- vestibule
- oral cavity
- palatoglossal arches
- palatopharyngeal arches
- lingual frenulum
- philtrum
- sulcus terminalis
- foramen cecum
- circumvallate papillae
- filiform papillae
- fungiform papillae
- torus tubarius
- epiglottis
- aryepiglottic fold
- sublingual gland
- submandibular duct

On the skeleton, you should find:

- maxilla
- palatine bone
- pterygoid laminae
- hyoid
- mandible

For the dissection of the oral cavity, you may find:

- opening of submandibular duct
- submandibular ganglion
- sublingual caruncle
- lingual tonsil
- foramen cecum
- palatine tonsil

LAB 36 – EAR

Date: December 10, 2009

Time: 10:00 AM

Corresponding Lecture: Ear

Lecturer: Toni Pak, PhD

Reading Assignment: Clinically Oriented Anatomy, 6th ed., 966-980

Objectives pertinent to this dissection:

1. Describe the functional anatomy of the external auditory meatus, tympanic membrane, ear ossicles and auditory tube, together with their major anatomical relations.
 2. Describe the arrangement of the lymphatic drainage of the head and neck and the major groups of lymph nodes.
 3. Interpret standard diagnostic images of the head and neck.
-

Case

A young boy was taken to a pediatrician because of a severe earache. An otoscopic examination revealed a bulging, inflamed tympanic membrane. His mother told the physician that the boy was recovering from a severe cold and throat infection.

Clinicoanatomical Problems

- Where do you think the ear infection was located? What is this type of inflammation called?
- How could an infection in the throat cause inflammation and bulging of the tympanic membrane?

For the dissection of the ear you should find:

Muscles

Tensor tympanii

Stapedius

Nerves

CN VII

Chorda tympani

Other

Tympanic membrane
Ossicles
Coclea
Semicircular canals