ANAT 51210 **Lectures 19 & 20**
Fall 2009

Osteology of the Ribs and Sternum

I. Thoracic cage

A. Composed of the ribs, costal cartilages, sternum, and thoracic vertebrae

B. Functions in protection and support, assists with respiration

II. Ribs: 12 pairs

A. True ribs vs. false ribs; floating ribs

1. True ribs: ribs 1-7 (direct attachment to the sternum)

2. False ribs: ribs 8-12 (no direct attachment to the sternum)

a. Floating ribs: ribs 11 & 12 (no attachment to the sternum)

B. Typical ribs: ribs 3-9

1. Capitulum costae (aka, head)

a. Superior articular facet: articulating with the inferior costal demi-facet of a thoracic vertebra (thoracic vertebra # = [rib # - 1])

b. Inferior articular facet: articulating with the superior costal demi-facet of a thoracic vertebra (thoracic vertebra # = rib #)

c. Interarticular crest: bony ridge found between the superior and inferior articular facets; ligament attachment site

2. Collum costae (aka, neck)

a. Crest: ridge on the superior surface

3. Tubercle

a. Articular facet: articulation with the transverse costal facet of the thoracic vertebra (thoracic vertebra # = rib #); positioned more inferiorly and proximally on the bone

b. Non-articular surface: site of ligamentous attachment between the rib and the transverse process of the thoracic vertebra; positioned more superiorly and distally on the bone

4. Corpus costae (aka, shaft or body)

a. Costal angle

b. Costal groove: located on the inferior deep border of the rib

c. Costal cartilage surface: attachment site for the costal cartilage, on distal end of corpus

C. Atypical ribs: ribs 1, 2, 10, 11, 12

1. First rib

a. Capitulum costae

i. Articular facet of the capitulum: for articulation with the superior costal facet of T1

b. Collum costae: no distinctive crest

c. Corpus costae

i. Groove for subclavian artery; proximal to the scalene tubercle

ii. Scalene tubercle: roughened elevation, on the inner border of the superior surface

iii. Groove for subclavian vein; distal to the scalene tubercle

iv. No costal angle

v. No costal groove

2. Second rib

    a. Tuberosity for the serratus anterior muscle: roughened area, on the outer border of the superior surface of the corpus costae

3. Tenth rib

    a. Capitulum costae is variable, with either one or two articular facets

    b. Articular facet of tubercle may be missing

4. Eleventh rib

    a. Capitulum costae: a single articular facet

    b. Collum costae and tubercle are absent

    c. Corpus costae: costal angle is present, but costal groove may be absent or very shallow; costal cartilage surface absent

5. Twelfth rib

    a. Capitulum costae: a single articular facet

    b. Collum costae and tubercle are absent

    c. Corpus costae: no costal angle, no costal groove, no costal cartilage surface

III. Sternum

A. Manubrium sterni (aka, presternum)

1. Jugular notch: concavity on the superior border of the manubrium

2. Clavicular notch: concave facet surface lateral to the jugular notch

3. Costal notches I and II

    a. Costal notch I lies immediately inferior and lateral to the clavicular notch

    b. Costal notch II lies at the inferior-lateral margin of the manubrium, where the manubrium joins with the gladiolus

i. Sternal angle: the angle formed by the anterior surfaces at the junction of the manubrium sterni and the gladiolus

B. Gladiolus (aka, corpus sterni or body)

1. Sternebrae 1-4: individual segments, typically fused together

2. Transverse lines: line between the individual sternebrae

3. Costal notches II-VII: found on the lateral margin of sternebrae 1-4

a. Costal notch II lies at the superior-lateral margin of the gladiolus, where the gladiolus joins with the manubrium

b. Costal notch VII lies at the inferior-lateral margin of the gladiolus, where the gladiolus joins with the xiphoid process

C. Xiphoid process (aka, ensiform process or metasternum): most inferior segment of the sternum