Quadrant II – Transcript and Related Materials

Quadrant Template II - Notes

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APPENDICULAR SKELETON

PECTORAL AND PELVIC GIRDLE IN VERTEBRATES

Appendicular Skeleton

The appendicular skeleton includes all of the limb bones, plus the bones that unite each limb with the axial skeleton. The Pectoral Girdle: The bones that attach each upper limb to the axial skeleton form the pectoral girdle (shoulder girdle). This consists of two bones, the scapula and clavicle. The clavicle (collarbone) is an S-shaped bone located on the anterior side of the shoulder. It is attached on its medial end to the sternum of the thoracic cage, which is part of the axial skeleton. The lateral end of the clavicle articulates (joins) with the scapula just above the shoulder joint. Pelvic girdle is made up of Ilieum, Ischium and Pubis bones.

Bones of the appendicular skeleton facilitate movement - girdles and limbs.Of the 206 bones, 80 are in the axial skeleton, with 64 in the upper appendicular and 62 in the lower appendicular skeleton.

Pectoral girdle

(shoulder blade) lies on the posterior aspect of the shoulder. It is supported by the clavicle, which also articulates with the humerus (arm bone) to form the shoulder joint. The scapula is a flat, triangular-shaped bone with a prominent ridge running across its posterior surface. This ridge extends out laterally, where it forms the bony tip of the shoulder and joins with the lateral end of the clavicle. By following along the clavicle, you can palpate out to the bony tip of the shoulder, and from there, you can move back across your posterior shoulder to follow the ridge of the scapula. Move your shoulder around and feel how the clavicle and scapula move together as a unit. Both of these bones serve as important attachment sites for muscles that aid with movements of the shoulder and arm. The right and left pectoral girdles are not joined to each other, allowing each to operate independently. In addition, the clavicle of each pectoral girdle is anchored to the axial skeleton by a single, highly mobile joint. This allows for the extensive mobility of the entire pectoral girdle, which in turn enhances movements of the shoulder and upper limb.

THE BONES OF THE PECTORAL/SHOULDER GIRDLE

The shoulder girdle connects to the bones of the fore limbs. These bones also provide attachment for muscles that move the shoulders and upper limbs.Glenoid cavity is formed for articulation of Humerus bone.

Clavicle

The clavicle is the only long bone that lies in a horizontal position in the body. The clavicle has several important functions. First, anchored by muscles from above, it serves as a strut that extends laterally to support the scapula. This in turn holds the shoulder joint superiorly and laterally from the body trunk, allowing for maximal freedom of motion for the upper limb. The clavicle also transmits forces acting on the upper limb to the sternum and axial skeleton. Finally, it serves to protect the underlying nerves and blood vessels as they pass between the trunk of the body and the upper limb.

Scapula

The scapula is also part of the pectoral girdle and thus plays an important role in anchoring the upper limb to the body. The scapula is located on the posterior side of the shoulder. It is surrounded by muscles on both its

anterior (deep) and posterior (superficial) sides, and thus does not articulate with the ribs of the thoracic cage. The suprascapular notch is located lateral to the midpoint of the superior border. The corners of the triangular scapula, at either end of the medial border, are the superior angle of the scapula, located between the medial and superior borders, and the inferior angle of the scapula, located between the medial and lateral borders. The inferior angle is the most inferior portion of the scapula, and is particularly important because it serves as the attachment point for several powerful muscles involved in shoulder and upper limb movements. The remaining corner of the scapula, between the superior and lateral borders, is the location of the glenoid cavity (glenoid fossa). This shallow depression articulates with the humerus bone of the arm to form the glenohumeral joint. The small bony bumps located immediately above and below the glenoid cavity are the supraglenoid tubercle and the infraglenoid tubercle, respectively. These provide attachments for muscles of the arm.

PECTORAL GIRDLE IN VERTEBRATES

In Fishes

The pectoral girdle has scapula, coracoid, clavicle, cleithrum, supracleithrum and post temporal bone which connects the supracleithrum to the skull.

In Amphibia (frog)

The pectoral girdle is present in the thorasic region and provides attachment to the forelimbs and their muscles.It consists of two equal halves, each half is divided into dorsal scapular portion and ventral coracoid portion.The scapular portion consists of supra scapula and scapula and coracoid portion consists of clavicle, epiclavicle, coracoid, precoracoid.

In Reptiles *(Varanus)*

Pectoral girdle is situated in the anterior region of the trunk.It helps for the attachment Of shoulder muscles.It has two similar halves, Each half consists of Supra scapula,scapula,coracoid and epicoracoid.At the junction of scapula and coracoid on the ventral side there is glenoid cavity for articulation of Humerus bone.

In Aves *(Columba)*

The pectoral girdle is the short bony structure connected with the sternum. It consists of scapula,coracoid and clavicle. The upper end of the coracoid articulates with the scapula which bears glenoid cavity for articulation.

In Mammals (Rabbit)

It lies outside the ribs between the fore limbs. It has two similar halves,each half is called as os-innominatum. Each half is made up of broad triangular plate, supracoracoid and small clavicle bone.The apex of the supracoracoid is terminating into glenoid cavity for articulation of Humerus bone.

The Pelvic Girdle

The pelvic girdle (hip girdle) is formed by a single bone, the hip bone or coxal bone (coxal = "hip"), which serves as the attachment point for each lower limb. Each hip bone, in turn, is firmly joined to the axial skeleton via its attachment to the sacrum of the vertebral column. The right and left hip bones also converge anteriorly to attach to each other. The bony pelvis is the entire structure formed by the two hip bones, the sacrum, and, attached inferiorly to the sacrum, the coccyx . Unlike the bones of the pectoral girdle, which are highly mobile to enhance the range of upper limb movements, the bones of the pelvis are strongly united to each other to form a largely immobile, weight-bearing structure. This is important for stability because it enables the weight of the body to be easily transferred laterally from the vertebral column, through the pelvic girdle and hip joints, and into either lower limb whenever the other limb is not bearing weight. Thus, the immobility of the pelvis provides a strong foundation for the upper body as it rests on top of the mobile lower limbs.

BONES OF THE PELVIC GIRDLE

- Ilium
- Ischium
- Pubis

Ilium : the curved, superior margin of the ilium is the iliac crest. The rounded, anterior termination of the iliac crest is the anterior superior iliac spine. This important bony landmark can be felt at your anterolateral hip. Inferior to the anterior superior iliac spine is a rounded protuberance called

the anterior inferior iliac spine. Both of these iliac spines serve as attachment points for muscles of the thigh.

Ischium : The ischium forms the posterolateral portion of the hip bone. The large, roughened area of the inferior ischium is the ischial tuberosity. This serves as the attachment for the posterior thigh muscles and also carries the weight of the body when sitting.

Pubis : The pubis forms the anterior portion of the hip bone . The enlarged medial portion of the pubis is the pubic body. Located superiorly on the pubic body is a small bump called the pubic tubercle. The superior pubic ramus is the segment of bone that passes laterally from the pubic body to join the ilium.

Pelvic girdle in Vertebrates

Bony Fishes

Itconsists of two plates called ischiopubic plates that articulates with the pelvic fins.

In Amphibia (Frog)

It lies in the posterior region of the trunk and it gives support to the hind limbs.It has two halves ,each half is called os-innominatum which is composed of ilium, ischium and pubis.At the union of the three bones there is a acetabulum cavity for articulation of the Femur bone.

In Reptile *(Varanus)*

The pelvic girdle is situated at the hind limb of the body for articulation of the hind limb bones. It has two halves ,each half is called os-innominatum which is composed of ilium, ischium and pubis. At the union of the three bones there is a acetabulum cavity for articulation of the Femur bone.

In Aves *(Columba)*

The pelvic girdle has two halves ,each half is called os-innominatum which is composed of ilium, ischium and pubis. At the union of the three bones there is a acetabulum cavity for articulation of the Femur bone. Behind acetabulum the pubis and the ischium are separated by obturator foramen.

In Mammals (Rabbit)

The pelvic girdle has two halves ,each half is called os-innominatum which is composed of ilium, ischium and pubis.The acetabulum is formed by ilium and ischium bones which articultes with the femur bone. Obturator Foramen is present.