Tikrit University
College of Veterinary Medicine

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Arthrology

The articulations or joints

An articulation or joint; is formed by the union of two or more bones or cartilages by other tissues.

In some cases a bone and a cartilage or two cartilages form a joint. The uniting medium is chiefly fibrous tissue or cartilage or a mixture of these. Union of parts of the skeleton by muscles called **(synsarcosis).**

Joint may be classified

a- **Anatomically** ; according to their mode of development, the nature of the uniting medium , and the form of the joint surface.

b- **Physiologically,** with regard to the amount and kind of movement or the absence of motility in them.

c- The combination of the foregoing considerations.

The chief division of the joints are three types*;*

1. **Synarthrosis**
2. **Diarthrosis**
3. **Amphiarthrosis**

1-Synarthrosis

In this group the segments are united by fibrous or cartilaginous tissue or a mixture of the two in such a manner as practically to preclude (prevent) movement; Hence there are often termed or called **fixed or immovable joints**. There is **no joint cavity**, most of these joints are temporary, because the space is invaded by ossified tissue **" ossification "** .

The following joints are included :-

1- Suture ; joints of skull , there is irregular interlocking margins forming the suture " serrate" line containing a fibrous tissue called **sutural ligament. e.g. frontal suture, Nasal suture.**

2- Syndesmosis : The space is collagen (white) fibrous or elastic tissue or mixture, example : union of the **shaft of the metacarpal bones and the costal cartilages .**

3- Synchondrosis : Two bones united by cartilages . example ; occipital bone and sphenoid bone of skull .

4- Symphysis: This term is usually limited to a few median joints which connect symmetrical parts of the skeleton .

e.g. : **symphysis pubis of pelvic bones** , **symphsis mandibulae**

The uniting medium is cartilage and fibrous tissue

5- Gomphosis : Implantation of the teeth in the alveoli of the mandibular and maxillary bones of skull.

2- Diarthrosis :

These are characterized by the presence of the joints cavity with a synovial membrane in the joints capsule , and their mobility called movable or true joints .

- A simple joint is one formed by two articular surface.
- A compound joint is formed by several articular surface. The following structures enter into their formation.

The following structures form this type

a- Articular surfaces ; In most cases smooth surfaces, formed by compact bones.

b- Articular cartilages , usually hyaline type , forming a covering over the articular surface of the bones. They are usually tend to form the curvature of the bone.

c-Joint capsule form a tube like around the articular bones attached around the articular surface , consist of two layers; **fibrous layer** " **external one** " and **synovial layer or membrane** " **internal one** " this layer secrete synovia which lubricate the joint it resembles white of egg . In many places the membrane extend out the joint to form a bursa between muscles and tendons.

The articular or joint cavity is enclosed by the synovial membrane and the articular cartilage .

The fibrous layer termed the capsular ligament, is attached either close to the margins of the articular surface or at a variable distance from them. Sometimes it is thick, bone or cartilage is present into or tendons pass over.

The synovial layer lines the joint cavity except on articular cartilage . The membrane is thin and richly supplied by blood and nerves . It have an a folds and villi which project into the cavity of the joint .

The joint cavity is enclosed by the synovial membrane and the articular cartilages. Normally, it contains only a sufficient amount of synovial to lubricate the joint.

d-Ligaments These are strong- bands composed of white fibrous tissue (collagen) fibers and elastic and these are divided into periarticular and intra articular , those are periarticular blended with the joint capsule or located aside of capsule which called lateral ligaments.

Intra- articular ligaments are restricted within the joint cavity.

e-Articular discs or menisci; Are plates of fibro- cartilage placed between the articular surface, they allow for diminishing concussion.

f-A marginal cartilage;Is a ring of fibro-cartilage which encircles the rim of an articular cavity; It enlarges the cavity and tend to prevent fracture of the margin.

Vessels and Nerves

Arteries form anastomosis around the large joint and gives off branches to the ends of bones and to the joint capsule . The synovial membrane have a network of capillaries.

The veins form a plexuses

Nerve fibers are especially numerous in and around the synovial membrane and there are a special nerve – ending , sensory "pain receptor " and motor .