

Name : Khurram imtiaz
ID : 16435
Department : Dpt
Semester : 2nd
Assignment : biomechanics
Submitted to : sir shahzeb

Question no 1:

Explain “ biomechanics of articular cartilage” ?

Articular cartilage :

Articular cartilage is the smooth white tissue that cover the ends of bones where they come together to form joints . Healthy cartilage in our joints make it easier to move . It allow the bone to glide over each other with very little friction . Articular cartilage can be damage by injury or normal wear and tear . Articular cartilage covers bones surface within the joint capsule .

Function of articular cartilage :

articular cartilage is a thin layer of specialized connective tissue with unique viscoelastic properties.

- Allows relatives movement of the opposing joint surface with minimize friction and wear .
- Despite common beliefs does not serve as a shock absorber .
- Very thin .
- Capacity negligible compared to muscle and bone .
- Surface roll or slide during motion .

Types of cartilage :

There are three types of articular cartilage.

1 : hyaline: most common found in ribs , nose , larynx , trachea , is a precursor of bone .

2: fibro: is found in inverteberal discs , joints capsule ligaments.

3: Elastic : is found in the external ear , epiglottis and larynx.

Location of articular cartilage :

Articular cartilage is the highly specialized connective tissue of diarthrodial joints. its principal function is too provide a smooth lubricated surface for articulation .

Water :

Water is the most abundant component of articular cartilage contributing upto 80 % of its wet weight.

Approximatly 30 % of these water is associated with the intrafibrillar space with in the collagen . The water flow through the cartilage and across the articular surface help to transport and distribute nutrient to chondrocytes in the addition to providing lubrication.

Summary : Articular cartilage is a highly specialised connective tissue of diarthroidal joints. Its principles function is to provide a smooth lubricated surface for articulation and to facilities the transmissions of load with a low frictional coefficient.

Question no 2:

Explain “biomechanics of tendons in ligaments”?

Tendons : Tendons connect muscle to bone . Tendon consist of bundles of collagenous fibers arrange in parallel they are arrange in this way to form cords which have great tensile strength . Origin at muscle crosses at least one joint and insert in bone .

Ligaments : Ligaments connect bone to bone . Ligaments consists mostly bundle of elastic molecules formed into elastic fiber with some bundles of collagen . Origin and insert in bone. More elastic and flexible than tendons . Offer less tensile strength.

Function : Tendons : Tendons carry tensil force from muscles to bones . They carry compressive force when wrapped around bone like a pulley . Proprioception Secondary function storage of energy .

Ligaments : Its maintains correct bone and joint geometry . Ligaments + associated joints capsules combinly function passive joints stablizers . Secondary function : propioception.

Mechanical properties of ligaments in tendons

Both are viscoelastic tissue Both exhibit the non linear behavior . Strength (sustain highly load) . When load is applied enough it cause injury damage , dependent on rate and amount of load .

Factor that effect the biomechanical properties of ligaments And tendons

Maturation and aging . Pregnancy and postpartum period . Mobilization and immobilization. Diabetes mellitus . Steroids . Non steroidal anti – inflammatory drugs . Hemodialysis . Grafts
