OPEN ACCESS Freely available online

Rheumatology: Current Research

Perspective

Functional and Structural Categories of Joints

Takashi Yokhama*

Department of Orthopaedic Surgery, Doshisha University, Kyoto, Japan

ABOUT THE STUDY

The connection between bones, ossicles or other hard body components that makes up the skeletal system of an animal into a useful whole is known as a joint, articulation, or articular surface. They are built with various levels and styles of movement in mind. Some joints, including the knee, elbow, and shoulder, are practically frictionless, self-lubricating, and capable of withstanding compression and supporting enormous loads while yet allowing for fluid and accurate movement. A to protect the brain and the sensory organs, other joints, like the sutures between the skull's bones; allow very limited movement (just during birth). The junction that connects a tooth to the jawbone is also referred to as a gomphosis and is characterized as being made of fibrous tissue. Joints are divided into functional and structural categories [1].

Classification

The number of joints depends on the definition of joints, the age of the individual, and whether sesamoids are counted. However, the majority of persons have the same number of sesamoids, with very few people having variances. Joints are primarily divided into structural and functional categories [2]. Functional classification is based on the amount of movement between the articulating bones, whereas structural classification is based on how the bones are connected to one another. The two categories of categorization frequently overlap in practice.

Clinical, numerical classification

- Monoarticular, concerning one joint.
- Oligoarticular or pauciarticular, concerning 2-4 joints.
- Polyarticular, concerning 5 or more joints.

Structural classification (binding tissue): Cartilaginous joint, Fibrous joint, and Synovial joint are the three different types of joints according to their structural makeup. In structural classification, joints are named and categorized based on the kind of tissue that binds the bones together. Joints can be categorized structurally into four groups;

- A fibrous joint is one that is connected by collagen-rich, dense regular connective tissue.
- Cartilage connects the joints in a cartilaginous joint. Primary cartilaginous joints made of hyaline cartilage and secondary cartilaginous joints made of hyaline cartilage covering the articular surfaces of the involved bones with fibrocartilage connecting them are the two types.
- Synovial joint not directly linked the bones are joined by the dense, erratic connective tissue that forms the articular capsule, which is typically accompanied with supplementary ligaments. The bones contain a synovial cavity.
- Facet joints connect two articular processes on either side of a vertebra.

Functional classification (movement): Additionally, joints can be categorized functionally based on the kinds and extent of motion they permit: The fundamental anatomical planes are used to explain joint motions.

- Synarthrosis movement is limited or non-existent. Joints with synarthrosis are often fibrous joints (e.g., skull sutures).
- Amphiarthrosis allows for minimal motion. The majority of the joints in amphiarthrosis are cartilaginous (e.g., intervertebral discs).
- Freely mobile synovial joint (sometimes referred to as a diarthrosis). According to the types of movement they permit, synovial joints can also be divided into six groups: plane joint, ball-and-socket joint, hinge joint, pivot joint, condyloid joint, and saddle joint.

In addition, joints can be categorized as nonaxial (gliding, such as between the proximal ends of the ulna and radius), monoaxial (uniaxial), biaxial, and multiaxial depending on how many axes of movement they permit. Another classification system separates joints with one, two, or three degrees of freedom based on the permitted degrees of flexibility. The number and types of articular surfaces flat, concave, and convex surfaces are further categorized. Trochlear surfaces are one type of articular surface [3].

Biomechanical classification: Additionally, joints can be categorized depending on their anatomy or their biomechanical characteristics. Joints are categorized into simple and compound, based on the number of bones involved, and complicated and combination joints, according to the anatomic classification:

- Two articulation surfaces make up a simple joint (e.g. shoulder joint, hip joint).
- Three or more articulation surfaces make up a compound joint (e.g. radiocarpal joint).
- Complex joint: articulation surfaces on two or more of them, as well as an articular disc or meniscus (e.g. knee joint).

Clinical significance: Joint dislocations and osteoarthritis can result from harming the articular cartilage in joints or the bones and muscles that support them. The joints can benefit greatly from swimming training while suffering little harm. A joint disorder is known as an arthropathy, and it is known as arthritis when one or more joints are inflamed [4]. Arthritis is a common component of joint illnesses; however injury to joints from external physical stress is often not classified as arthritis. When multiple joints are involved, an arthropathy is referred to as polyarticular (multiarticular), and when just one joint is, it is referred to as monoarticular [5].

Correspondence to: Takashi Yokhama, Department of Orthopaedic Surgery, Doshisha University, Kyoto, Japan; E-mail: Yokhamashi12@yahoo.com

Received: 17-Oct-2022, Manuscript No. RCR-22-20504; **Editor assigned:** 20-Oct-2022, PreQC No. RCR-22-20504 (PQ); **Reviewed:** 03-Nov-2022, QC No. RCR-22-20504; **Revised:** 10-Nov-2022, Manuscript No. RCR-22-20504 (R); **Published:** 17-Nov-2022, DOI: 10.35841/2161-1149.22.12.319

Citation: Yokhama T (2022) Functional and Structural Categories of Joints. Rheumatology (Sunnyvale). 12: 319.

The main cause of impairment in adults over 55 is arthritis. Arthritis can take many distinct forms, and each type has a unique aetiology. Osteoarthritis, also known as degenerative joint disease, is the most prevalent type of arthritis. It can develop after an injury to the joint, after an infection of the joint, or just as a result of ageing and the degradation of articular cartilage. Additionally, there is mounting evidence that osteoarthritis may develop early due to aberrant anatomy [6].

Rheumatoid arthritis and psoriatic arthritis are autoimmune disorders in which the body attacks itself and are other types of arthritis. Joint infection is the primary cause of septic arthritis. Uric acid crystals build up in the joint, which then becomes inflamed, to induce gouty arthritis. In addition, there is a less typical type of gout that develops when calcium pyrophosphate crystals take the shape of rhombicoids. Pseudo gout is the name for this type of gout [7].

The jaw joints are affected by the condition known as Temporomandibular Joint syndrome (TMJ), which can result in a variety of symptoms including facial pain, jaw clicking, and restricted jaw movement. It may be impacting up to 75 million Americans and is brought on by psychological stress and jaw misalignment (malocclusion) [8].

REFERENCES

1. Susanne G, Dominique M. Recent advances in the treatment of osteoarthritis. F1000Res. 2020; 9.
2. Mehta S, He T, Bajpayee AG. Recent advances in targeted drug delivery for treatment of osteoarthritis. Curr Rheumatol Rev. 2021; 33(1):94.
3. Arden NK, Perry TA, Bannuru RR, Bruyère O, Cooper C, Haugen IK, et al. Non-surgical management of knee osteoarthritis: comparison of ESCEO and OARSI 2019 guidelines. Nat Rev Rheumatol. 2021; 17(1):59-66.
4. Schulze-Tanzil G. Experimental therapeutics for the treatment of osteoarthritis. J Exp Pharmacol. 2021; 13:101.
5. Dudek M, Gossan N, Yang N, Im HJ, Ruckshanthi JP, Yoshitane H, et al. The chondrocyte clock gene Bmal1 controls cartilage homeostasis and integrity. J Clin Investig. 2016; 126(1):365-376.
6. Yuan G, Xu L, Cai T, Hua B, Sun N, Yan Z, Lu C, Qian R. Clock mutant promotes osteoarthritis by inhibiting the acetylation of NFκB. Osteoarthr Cartil. 2019; 27(6):922-931.
7. Song X, Ma T, Hu H, Zhao M, Bai H, Wang X, et al. Chronic Circadian Rhythm Disturbance Accelerates Knee Cartilage Degeneration in Rats Accompanied by the Activation of the Canonical Wnt/β-Catenin Signaling Pathway. Front Pharmacol. 2021; 12.
8. Zhou M, Yang S, Guo Y, Wang D, Qiu W, Wang B, et al. Shift work and the risk of knee osteoarthritis among Chinese workers: A retrospective cohort study. Scand J Work Environ Health. 2020; 46(2):152-160.