

# Development of Joint Space Narrowing Articular Cartilage Regeneration and their Applications

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## DESCRIPTION

All over the body, cartilage is a non-vascular form of supportive connective tissue. Collagen and elastic fibers make up the dense and gel-like substance known as cartilage. It contains chondroitin sulfates, a type of polysaccharide derivative, which combines with the protein in the ground substance to produce proteoglycan. Joints and bones are shielded by cartilage. The cells known as chondroblasts, which develop into chondrocytes and are present in spaces known as lacuna, generate the matrix.

The "chondrocytes," or specialized cartilage cells, that make cartilage are strong and smooth tissues that produce a matrix of collagen, proteoglycans, and other non-collagenous proteins. These substances help cartilage retain water and give it its particular shape. Articular, or hyaline, cartilage covers bone ends to lessen friction and offer cushioning at the joint surface. Healthy joint cartilage effectively permits fluid bending and straightening actions and safeguards the joint from weight-bearing strains.

The joint loses some of that protective cushion if the cartilage starts to deteriorate with age or if it were to sustain damage from an injury, exposing underlying bone ends. Damage like this can result in overstressing bone tissue that isn't built to withstand powerful forces. Instead, nutrients permeate through the perichondrium, a dense connective tissue that surrounds the cartilage, and enter the cartilage's core.

Compared to other tissues, cartilage heals and develops more slowly because it lacks blood vessels. This cartilage, which covers the articular surface, has a smooth shape that permits bone ends to glide over one another while resisting shearing. It accounts for 10% to 20% of the thickness of the articular cartilage and has the most collagen of any zone. The capacity to stand, move, and do any other action involving the joints and bones depends in large part on the cartilage. It aids in the smooth motion of the bones and absorbs shocks.

## Hyaline cartilage

The most prevalent type of cartilage in a human body is hyaline cartilage. It covers the ends of the bones and lines the joints. The hyaline cartilage that covers the ends of the bones is referred to as articular cartilage. Because it is slick and slippery, hyaline cartilage aids in the smooth passage of the bones through joints. It is strong enough to keep the joints from losing their structure while still being flexible.

## Fibrocartilage

Fibrocartilage is strong cartilage consisting of dense fibers, much as its name implies. It is the least flexible and the strongest of the three. It is resilient enough to withstand impacts and stabilize various bodily parts.

## Elastic cartilage

The cartilage is most flexible when it is elastic. It supports the bodily parts that must bend and move in order to perform their functions. Even after a significant force, elastic cartilage can return to its previous shape. It is able to bend and move without injury before returning to its original shape.

The location and type of damage to the cartilage will determine how it is treated. Typically, when cartilage is torn or ruptured, nearby structures are also harmed. The doctors or surgeon will concentrate on treating the cartilage as part of the overall injury. While some cartilage injuries recover on their own with rest and time, some need to be repaired surgically (often with an arthroscopy). Consult the doctor or surgeon for more information on what to anticipate and how long it will take to recuperate. As avascular tissue, cartilage typically takes longer to recover than other body components because it doesn't immediately receive blood flow. A direct stretch can lubricate and nourish the cartilage with synovial fluid and help to avoid joint stiffness. Stretching activities like yoga and pilates can ease osteoarthritis symptoms while simultaneously building muscle strength to guard against further cartilage damage.

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