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WELL BEING

HEALTHWATCH

Get up and get going

With Autologous Chondrocyte Implantation (ACI) now available in India to treat cartilage defects in the knee, patients are back on their feet in a short span of time.

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SHOCK ABSORBED: *If the articular cartilage is damaged, falls can hurt the joint.* PHOTO: AP

Cartilage is a stiff and inflexible connective tissue found in many areas in the human bodyincluding the joints. All our joints are covered with an almost translucent, shiny and extremely slippery white surface, which is described as hyaline cartilage. It is not as hard and rigid as bone but is stiffer and less flexible than muscle. It does not contain blood vessels. Compared to other connective tissues, cartilage grows slowly and repairs rarely.

How it happens

Articular Cartilage functions like a shock absorber. If the cartilage is defective, the joint is damaged. Cartilage defects of the joints, like the hip and knee following injury, are common, more so among adolescents and young adults. Large defects heal poorly, cannot regrow and may lead to premature Osteoarthritis. Athletic injuries that can damage articular cartilage include harsh pivoting, twisting manoeuvres and not taking proper precautions when landing from jumps. Cartilage injuries may occur along with injuries to knee ligaments.

Osteochondritis Dissecans (OCD) is a joint disorder in which cracks form in the articular cartilage and the underlying subchondral bone. This is due to decreased blood flow to the subchondral bone, which causes the bone to die in a process called avascular necrosis. The bone is then reabsorbed by the body, leaving the articular cartilage it supported prone to damage. It is a rare disorder.

The patients with cartilage defects may complain of recurrent episodes of swelling because of fluid collection in the joint and pain. Normal daily activity will be affected. If ignored, this leads to early and progressive wear and tear of the articular cartilage. An x-ray usually cannot diagnose articular cartilage damage because it shows only bone injury. MRI scans rarely diagnose articular cartilage injuries. The extent of the lesion and final diagnosis is confirmed only by arthroscopy.

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Conventional treatment

The aim of articular cartilage repair is to restore the surface of a joint's hyaline cartilage. Over the last decades, surgeons and researchers have been working hard to elaborate surgical cartilage repair interventions.

Arthroscopic Lavage: This is "cleaning up" of the knee joint. It focuses on removing degenerative articular cartilage flaps and fibrous tissue. It has poor results.

Marrow Stimulation Techniques (Microfracture Surgery and others): Damaged cartilage is drilled or punched until the underlying bone is exposed. This generates a blood clot within the defect, which insufficiently fills the chondral defect with repair material that is often fibrocartilage (though not as good mechanically as hyaline cartilage).

Osteochondral Autografts and Allografts: This requires transplantation of sections of bone and cartilage. First, the damaged section of bone and cartilage is removed from the joint. Then a new healthy dowel of bone with its cartilage covering is taken from an area of the joint where the stress is low or negligible to prevent any further damage. This is replanted into the space formed by removing the damaged bone and cartilage. However this method is used to treat defects less than 4cm 2. It causes pain in the donor area.

Latest treatment

Till recently, Autologous Chondrocyte Implantation (ACI) was not available in India. Now it is the most-preferred line of treatment for cartilage defects. Autologous Chondrocyte Implantation basically means 'to get cartilage cells (chondrocyte) from yourself (autologous)' and is sometimes referred to as Autologous Chondrocyte Transplantation. It is a two-stage procedure.

The first involves harvesting a tiny portion of cartilage from a healthy area of the knee. This is sent to a specialist laboratory where the cartilage cells (chondrocytes) are cultivated in a special media that promotes their growth. This usually takes 3-6 weeks. The cells may also be allowed to grow and multiply in a 3D type II collagen matrix and returned in six weeks to fill the defect. This is called Scaffold supported autologous chondrocyte implantation (SSACI). In the second stage, the cartilage cells are injected into the diseased area in combination with a membrane (biomembrane) or in a scaffold matrix.

A leg brace is necessary while the cells grow and fill the defect in the cartilage. The patient can walk normally in three months and return to normal sporting activity after a year. This procedure is a boon for young people especially sportsmen, as it brings them back to their normal within a few months and prevents complications like osteoarthritis.

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