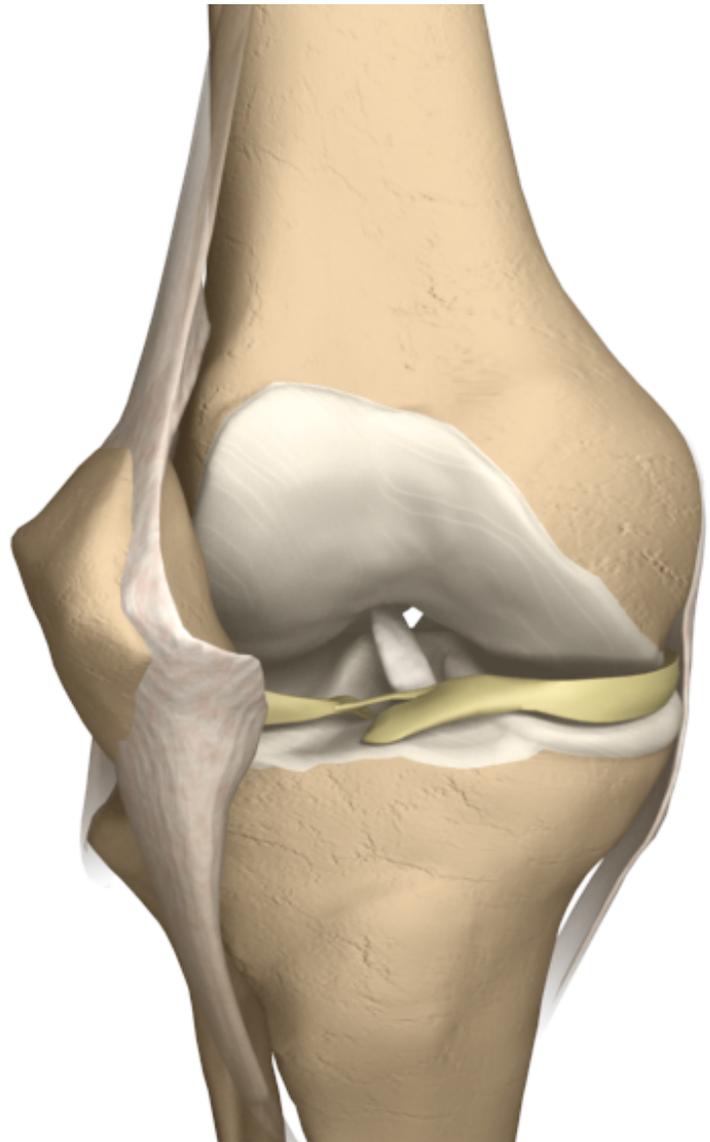


Autologous Chondrocyte Implantation

Articular cartilage is a firm, rubbery tissue that covers the ends of bones. It provides a smooth gliding surface for joints and acts as a cushion between bones. Cartilage can break down due to overuse or injury. This can lead to pain and swelling, and problems using your joint. Your treatment will depend on the size and type of lesion resulting from the articular cartilage damage and the judgment of your surgeon.

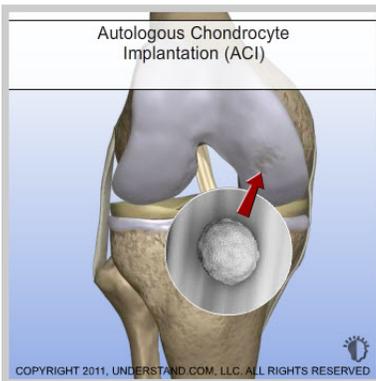


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Articular Cartilage Introduction

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When the Procedure is Performed

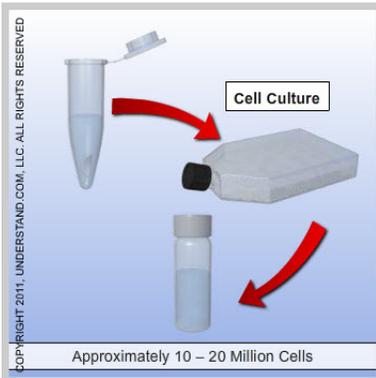
In certain situations, a treatment in which your own cells are implanted to repair articular cartilage damage can be performed. This procedure is known generically as a cartilage patch, or more specifically as autologous chondrocyte implantation, or ACI. Autologous means that the implanted cells come from you, and the term chondrocyte is the name for the type of cartilage cells that repair the damaged area, known as a lesion. ACI is typically reserved for patients who have sustained an injury resulting in full-thickness, or near full-thickness damage to the articular cartilage. It is not done when cartilage damage is due to degenerative arthritis (osteoarthritis) or when damage is extensive. More than one lesion can be treated with ACI in the same knee.

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Incisions and Cartilage Biopsy

ACI is done in two separate procedures. In the first, small incisions (portals) are made around the joint. A scope is inserted into the knee. Saline solution flows through a tube (cannula) and into the knee to expand the joint and to improve visualization. The image is sent to a video monitor where the surgeon can see inside the joint. Surgical instruments go into an incision, and a small portion of healthy cartilage, called a biopsy, is removed from a non weight-bearing region of the articular cartilage. After the biopsy, the surgical instruments are removed, and the first procedure is completed.



Cell Culture

Cells collected from the biopsy are sent to a laboratory where they are prepared and grown in a culture for a period of several weeks. This process multiplies the number of cells to ten million or more, which will be enough to attach to the original cartilage during the healing process and repair the lesion. The second procedure is scheduled to occur after a sufficient number of cells have been cultured.



Cell Implantation/Repair

The second procedure starts with a larger incision that exposes more of the knee joint. The knee cap (patella) is moved to the side to expose the articular cartilage. The surgeon carefully removes any dead or damaged tissue from the lesion, and smooths the surrounding healthy tissue. Next, a second incision is made over the shin bone (tibia), and a flap of the thick membrane that covers the bone (periosteum), is harvested. This flap of tissue is approximately the size of the prepared site in the articular cartilage and will serve as a patch. Next the surgeon uses dissolving sutures to affix the patch to the previously damaged area, and the cultured cells are injected into the pocket formed beneath the patch.



End of Procedure

After the tissue is in place, the incisions are closed and the procedure is completed. During a relatively slow healing process that involves physical therapy, cartilage cells that were injected under the patch will attach to original cartilage, grow, and mature as they ultimately repair the damaged cartilage. This animation showed one of several variations for ACI. Other variations involve synthetic patches, affixing or impregnating patches with cells, or single-step techniques. Autologous cartilage implantation may also be done with other procedures that repair the meniscus or realign the knee to alleviate pressure on the new cartilage patch. Your surgeon will determine the best procedure for you based upon your lesion location, size, and mechanical alignment.