

Cartilage pathologies

The cartilage covers the surface of the bones allowing them to slide over each other, and as such it is exposed to wear and tear, especially in areas subject to stress. The seriousness of the damage is directly proportional to the depth of the lesion in the affected area. Methods of treatment have shown an ongoing development of techniques on the basis of a clinical and histological analysis of the results.

Among the currently most innovative and debated techniques are:

- ***Radiofrequency treatment***: this method may be considered a development of the laser treatment, and is based on the principle that a modulated application of thermal energy in the damaged area creates a compact biological “scar” that develops according to the induced cellular response.
- ***Homologous cartilage transplant***: this involves the surgical removal of the patient’s cartilage cells followed by a period of approximately three weeks to allow the cultivation and growth of the cartilage tissue. The newly formed cartilage is subsequently implanted as a compact gel/matrix covered by a flap of periosteum or biocompatible material which is shaped to form an overlap.

To compensate for the greater complexity and invasiveness of this technique, tests have shown that the newly formed cartilage is very similar to the original.

Cartilage lesions

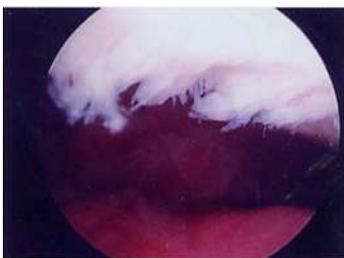
Articular cartilage protects the surface of the bones as they slide over each other, and as such is exposed to considerable wear and tear, especially in the areas subject to stress.

The seriousness of the damage is directly proportional to the depth of the lesion and to the affected area.

The methods that are used show an ongoing development of the techniques on the basis of clinical, functional and histological analysis of the results.

1- Radiofrequency treatment

The method is a development of laser treatment and makes a modulated use of thermal energy in the areas affected by the lesion, which generates a compact and uniform biological scar which evolves on the basis of the induced stimulation of the cartilaginous cells. The technique requires great care in the use of thermal laser energy.



Arthroscopic image of radiofrequency treatment of a cartilaginous lesion

2 –Osteochondral transplant

Osteochondral transplant is appropriate when dealing with a full-thickness cartilage lesion which presents irregularities or substantial loss of the bone base for the cartilage implant.

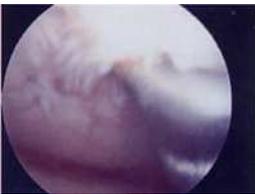
The technique involves the removal of a cylinder of cartilage-covered bone in the area not subject to stress and its implant in the area of the lesion so as to provide a stable and congruent articular surface.



Schematic and arthroscopic images of osteochondral transplant

3 –Microperforation/microfracture

This technique is the modern development of a technique that has been in use for over twenty years: a special instrument is used to stimulate the bone below the damaged cartilage. This stimulation produces the healing scar of the cartilage. The results obtained with the use of the most appropriate technique are similar to those obtained with cartilage transplants in patients of comparable ages and levels of activity.



Arthroscopic image of microperforations carried out on the femoral condyle and the tibial plateau

4 –Homologous cartilage transplant

This involves the removal of the patient's cartilaginous cells which are cultivated and then reimplanted in the same patient in the area of the lesion, thereby restoring the correct form and anatomical congruence. The entire procedure may be carried out with arthroscopy.

The validity of the technique depends on the following codified and scientifically proven rules:

- 1) isolated cartilage lesion
- 2) ligament stability
- 3) absence of significant axial deviations
- 4) age < 45 years



Schematic image showing an osteochondral lesion to the femoral condyle and subsequent cartilage transplant



Intraoperative image of trochlear and patellar cartilage transplant