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Case Report

Hyalofast and Nano Fractures in Osteochondral Lesions

Lanzat Nicolas Federico[1*], Paoletta Ruben Edilio[1]

[1]Physician, Senior specialist in traumatology and orthopedics, Member of the argentine association of traumatology and orthopedics, Member of the argentine association of arthroscopy, Buenos Aires, Argentina.

***Corresponding Author:** Lanzat Nicolas Federico, Senior specialist in traumatology and orthopedics, Buenos Aires, Argentina.

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Abstract

Hyalofast was applied to a 42-year-old patient with an osteochondral lesion of the patella and medial femoral condyle of the left knee. Hyalofast was administered during knee arthroscopy. The patient was followed for one year and showed complete recovery, both in terms of imaging and symptoms. The efficacy and safety of Hyalofast in the treatment of osteochondral lesions of the knee were evaluated. Hyalofast's ability to promote cartilage regeneration and relieve pain was analyzed, comparing the results with other conventional treatments. The aim is to present and propose this treatment as a valid alternative for restoring joint integrity.

Keywords: *Hyalofast, Osteochondral lesions, Arthroscopy, Patella, Medial femoral condyle.*

Introduction

Osteochondral lesions (OCLs) are defined as defects in the articular cartilage with involvement of the underlying subchondral bone. They are caused by multiple factors, such as embolisms, ossification defects, endocrine causes, genetic predisposition, avascular necrosis, etc., but traumatic injury is currently the most widely accepted cause, whether repetitive microtrauma or a single traumatic event. Without treatment, it can progress to osteoarthritis, which is particularly problematic in young patients who wish to maintain a high level of activity [1].

The diagnosis is suspected clinically and based on standard radiographs. Magnetic resonance imaging allows for more precise determination of the coronal and sagittal lengths. Arthroscopy allows for assessment of the depth of the lesions. Several of these lesions have been classified arthroscopically. The oldest and most widely used is the Outerbridge classification because it is easy to use in routine practice [2]. The International Cartilage Repair Society (ICRS) classification is based on the depth of the lesion.

There are many treatment options. The choice of treatment depends on several factors, primarily the patient's activity level and age, the etiology, and the severity of the lesion. [3]

The aim of this article is to analyze a case treated with the application of the Hyalofast biological membrane and perforations, within the current treatment options.

Original case study on the use of biodegradable and biocompatible membrane an osteochondral lesion, applying scientific innovation to osteochondral lesion, a pathology that still lack a definitive treatment algorithm. Due to the topic and the impact of our result, we believe this work represents an ideal contribution to sciencevolks.

Case Presentation

A 42-year-old female patient presents. She is of medium build, weighs 72 kilograms, and is 1.78 meters tall. During questioning, she reports pain in her right knee when performing flexion exercises, squats, and lunges at the gym, but especially "pressure and pain on very humid days." she denies any traumatic event but recalls a minor injury eight years prior, caused by a fall from standing height. Physical examination reveals a positive knee tap (two out of three crosses), patellar tilt pain, and pain on digital palpation of the medial compartment of the right knee. A nuclear magnetic resonance imaging (MRI) scan was performed, revealing type iv outerbridge patellar chondromalacia and a type iv outerbridge lesion of the medial femoral condyle. Initially, the patient was treated with physical therapy, undergoing 30 sessions with no change in symptoms. The patient was then prescribed analgesics and articular cartilage protectors. Subsequently, three injections were administered: the first with corticosteroids and high molecular weight hyaluronic acid, and the other two, one week apart, with hyaluronic acid alone. These treatments yielded no satisfactory results, and the patient continued to experience the same symptoms.

In a follow-up appointment, the patient was advised to undergo exploratory arthroscopy and use a stimulation technique with nanofractures and hyalofast placement.

Hyalofast is presented as a biodegradable and biocompatible 3d matrix of hyaluronic acid, designed for cartilage regeneration in chondral or osteochondral lesions. It acts as a scaffold for mesenchymal stem cells combined with nanofractures for joint repair in joints such as the knee, hip, and ankle. The hyalofast membrane is composed of a non-woven mesh derived from hyaluronic acid, a natural component of the extracellular matrix. Its function is to trap stem cells and promote the regeneration of articular cartilage, being reabsorbed by the human body after its function.

It is applied using dry arthroscopic procedures for type iii-iv outbridge cartilage lesions. We suggest its use in lesions smaller than 15 cm in diameter. Perform arthroscopic debridement and nanofractures before opting for more invasive therapies, such as osteochondral autotransplantation, allotransplantation, or autologous transplantation of cultured chondrocytes. There are no studies comparing the different matrices or membranes used.

Its simple application and compatibility with arthroscopic techniques position it as a valuable tool in cartilage-conserving surgery.

Surgical technique: the patient is placed in the supine position on the operating table. The knee is flexed to 90 degrees, a hemostatic sling is applied, and anterolateral and anteromedial knee arthroscope portals are created. Exploratory arthroscopy is performed, revealing a patellar cartilage lesion and a lesion of the medial femoral condyle, both classified as outbridge type iv. Shaving, synovectomy, and five nanofractures are performed on both lesions. Hyalofast is then applied under a guide wire in dry weather. Correct placement was observed under arthroscopy. Skin closure was then performed. Postoperative care: the patient was kept non-weight-bearing for three weeks using an orthosis, followed by partial weight-bearing. Physical therapy and a gradual return to daily activities were also initiated.

Figure 1. Injury measurement

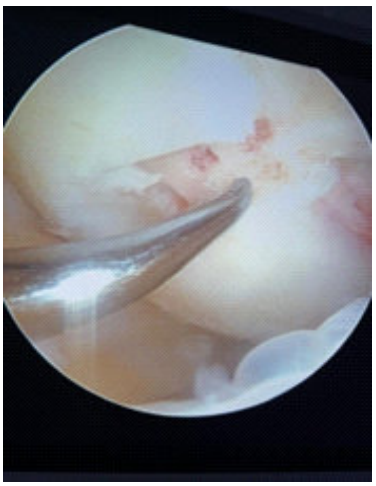

Figure 2. Estimulation and nano fractures.

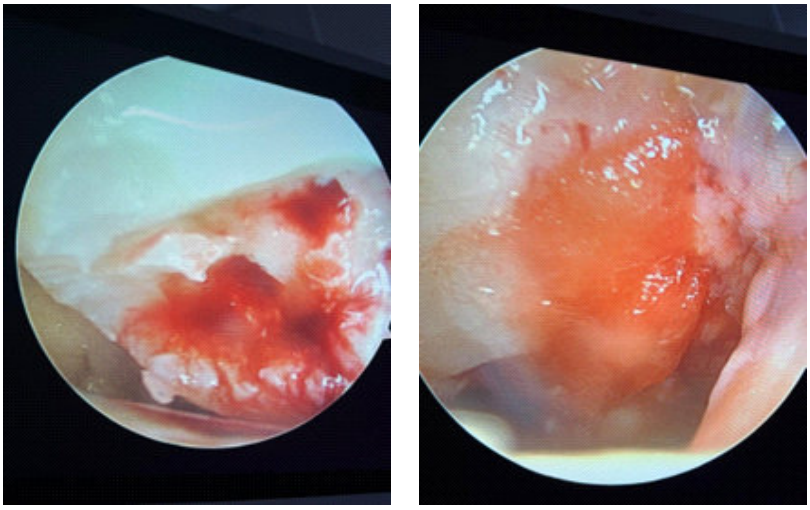

Figure 3 and 4. Dry arthroscopy. Bleeding and placement of Hyalofast.

Out Come

In this one-year follow-up case report, we have obtained excellent results with the application of hyalofast; no complications have been recorded. The patient has returned to their normal daily activities and sports activities.

Results obtained by magnetic resonance imaging:

Regenerative characteristics of the cartilage were observed, along with a significant decrease in bone edema, a decrease in joint effusion, and the presence of chondral tissue in the area of the lesion.

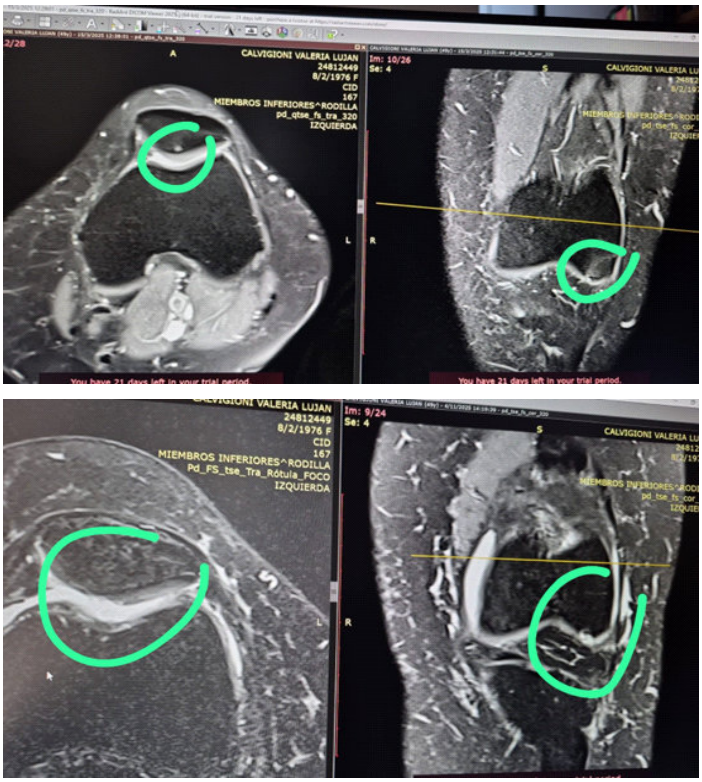

Figure 5 and 6. comparison in magnetic resonance imaging of lesions at baseline and at one year.

Discussion

It has been shown that, in the case of osteochondral injury, cartilage tissue does not inherently possess regenerative capacity; that is, it does not spontaneously form de novo tissue identical to the original that can perform the same functions. When a cartilage defect is left untreated, the joint deteriorates irreversibly and progressively, leading to osteoarthritis and, ultimately, disability.

It is the application of hyalofast combined with nano fractures, a treatment option for osteochondral lesions of the knee. A simple implementation proposal is then offered, without undesirable side effects; it is a less invasive treatment than others conventionally used. [1-4]

Conclusion

The use of hyalofast and nanofractures in chondral lesions of the femoral condyle and patella represents an effective and less invasive alternative to more complex techniques. Its simple application and compatibility with arthroscopic techniques position it as a valuable tool in cartilage-conserving surgery.

Conflict of Interest

The authors declare that there is no conflict of interest.

Ethical Approval

This article is presented with ethical approval and patient consent.

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