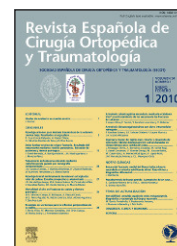


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ORIGINAL ARTICLE

Acute septic arthritis secondary to arthroscopic anterior cruciate ligament repair. Report on 2 cases

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KEYWORDS

Anterior cruciate ligament;
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PALABRAS CLAVE

Ligamento cruzado anterior;
Artroscopia;
Artritis séptica

Abstract

Purpose: To review 2 cases of septic arthritis following arthroscopic repair of the anterior cruciate ligament, diagnosis and treatment options.

Materials and methods: We present two cases of acute knee arthritis arising as a complication of anterior cruciate ligament reconstruction. Semitendinosus and gracilis tendons were used for both repair procedures. Diagnosis was based on arthrocentesis after clinical suspicion accompanied by a disruption of analytical parameters. Both patients were treated with arthroscopic surgery, with arthroscopic debridement and lavage without extracting the graft. Intravenous antibiotic treatment was prescribed. Infection did not recur in either patient in 3 years.

Conclusion: Early arthroscopic debridement and lavage and specific antibiotic treatment are the basis for initial treatment of acute infections following ACL repair. In the majority of cases, this treatment prevents the recurrence of infection.

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Artritis sépticas agudas secundarias a reparación artroscópica de ligamento cruzado anterior de la rodilla. A propósito de 2 casos

Resumen

Objetivo: Revisar 2 casos de artritis séptica secundaria a reparación artroscópica de ligamento cruzado anterior, su diagnóstico y sus opciones terapéuticas.

Material y método: Se presentan 2 casos de artritis aguda de rodilla como complicación de la reconstrucción del ligamento cruzado anterior. Ambas reparaciones se realizaron con los tendones de los músculos semitendinoso y recto interno. El diagnóstico se realizó mediante artrocentesis tras sospecha clínica acompañada de alteración de los parámetros analíticos. Se trató a los 2 pacientes mediante cirugía artroscópica, se efectuaron desbridamientos y lavados artroscópicos sin extraer el injerto y se instauró tratamiento

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antibiótico intravenoso. Se controló la infección en ambos pacientes, sin recurrencia a los 3 años de seguimiento.

Conclusión: El desbridamiento y el lavado artroscópico precoz y el tratamiento antibiótico específico conforman la base del tratamiento inicial de las infecciones agudas tras la realización de una reparación del LCA, de forma que en la mayoría de los casos se pueda evitar la recurrencia de ésta.

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Introduction

The incidence of deep infection secondary to arthroscopic repair of the anterior cruciate ligament (ACL) of the knee is low, with estimations that range from 0.14 to 0.78% of the cases^{1,2}. Due to the rarity of this type of complication, experience with it is based on a limited number of cases and the medical literature contains few series with very low numbers of patients.

Systematic review of medical bibliography is unhelpful as to when the graft should be maintained or removed, when to use continuous irrigation or perform intermittent arthroscopic lavage, or when to administer intravenous medication in contrast to oral and for how long. Nor are clinical laboratory results that should mark the difference between an infection and a postoperative inflammatory reaction clearly established either^{3,4}.

Case histories

Two patients (0.6%) out of 322 hamstring grafts implanted in our centre (ligamentoplasty with a semitendinosus-

gracilis tendon autograft) suffered an acute infection. Both were male, aged between 22 and 24 years (figs. 1 and 2).

The interval between reconstruction and symptom onset was 10 days. Clinical manifestations were persistent pain and fever, accompanied by local signs of inflammation and oedema. Laboratory studies showed alterations in leukocyte counts, sedimentation rate and C-reactive protein. Both patients received arthrocentesis and the gram was determined in the synovial fluid obtained. The samples were sent to microbiology to rule out aerobic and anaerobic germs and fungi.

Following arthrocentesis, the patients were treated with antibiotics empirically until the culture results were known. Debridement and arthroscopic lavage with saline were performed on both patients; the first patient received 2 arthroscopic lavage procedures and the second, 4. It was decided to conserve the ligamentoplasty. Intraoperative findings showed graft integrity with more than 70% preservation and the debridement of the fibrous material and slough around the graft was performed. Clinical evolution was favourable after the arthroscopic lavage procedures; specific antibiotic treatment based on the antibiogram was established and continued for 6 weeks, until the parameters of infection became normal. Progressive



Figure 1 Coronal cut, T2 sequence, in which the presence of ACL plasty debris can be seen, with slight oedema in the femoral tunnel.



Figure 2 Sagittal cut, T1 sequence, in which the presence of ACL plasty debris can be seen.

physical therapy was given to the patients after 3 weeks of absolute bed rest from the moment of infection diagnosis. There were no problems of rigidity or arthrofibrosis in either of the two patients.

The patients achieved mobility with joint range similar to that of the contralateral knee. On examination, both patients were free from signs of instability in the affected knee. The two patients returned to their normal sports activities.

The pathogens isolated were *Staphylococcus epidermidis* and methicillin-resistant *Staphylococcus aureus*. The antibiotic prescribed for the case of *S. epidermidis* was amoxicillin-clavulanate for 6 weeks (intravenously for 3 of these). The patient with the methicillin-resistant *S. aureus* infection needed intravenous vancomycin for the 6 weeks the treatment lasted.

After 3 years of follow-up, both patients are clinically sound, without any signs of reoccurrence of the infection.

Discussion

The goals of treatment of septic arthritis secondary to ACL reconstruction are two: first, preserve the articular cartilage and, second, maintain the graft. Early joint decompression is necessary to minimise sequelae (which include osteomyelitis and joint degeneration), accompanied by specific antibiotic treatment⁵.

Technical recommendations as to the number of lavage procedures, the use of intermittent lavage and the length of antibiotic treatment vary widely in the medical literature. The most recent publications generally indicate greater efficacy of lavage and arthroscopic debridement over arthroscopy, with a decrease of morbidity. Arthroscopy permits joint decompression, satisfactory debridement and shorter recovery time than open surgery.

The graft should be removed and the fixation material extracted when there is an infection resistant to the initial treatment or when the graft is shown to be infected. In our cases, early antibiotic treatment and performance of successive arthroscopic lavage procedures managed to control the infection and preserve the integrity of the articular cartilage and the ligamentoplasty.

Known risk factors for developing septic arthritis after knee arthroscopy are having had a prior procedure in the same joint and steroid treatment before surgery⁶.

The majority of the studies coincide in identifying *S. aureus* and coagulase-negative *Staphylococcus aureus* as the pathogens most frequently isolated in post-ligamentoplasty infections. Due to the existence of polymicrobial infections, different samples should be taken from synovial fluid, blood and graft, as well as from both the tibial and femoral tunnels⁸⁻¹².

The published results of treatment for acute joint infection after ACL reconstruction vary considerably. Williams et al.⁵ initially treated post-ligamentoplasty infection by arthroscopic debridement and graft retention in 6 of their 7 patients. The infection persisted in 4 patients, who required a new debridement in which the graft was removed. Indelli et al.¹ performed arthroscopic debridement with graft retention in 6 patients as the initial treatment; 5

patients required successive arthroscopic procedures and 2 grafts had to be removed. McAllister et al.⁴ maintained the graft in their 4 patients, and one of them required successive debridement operations. Viola et al.⁷ removed the graft in 6 of 14 patients who had not improved after intravenous antibiotic treatment.

Intensive debridement is the key factor in preventing the persistence of the infection. If the graft is maintained, debridement cannot be performed in tunnels that may be infected. That is why, faced with the suspicion of infection, the graft should be removed and the tunnels checked. There are no studies that indicate frequency of osteomyelitis in tunnels.

In conclusion, debridement and early arthroscopic lavage plus specific antibiotic treatment form the basis for initial treatment of acute infections following ACL repair. In the majority of cases, this treatment prevents the recurrence of infection.

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