

Case Report

How to repair an immediately post-operative anterior cruciate ligament reconstruction failure? About a clinical case

Joao Esteves*, João Maia Rosa, Luís Barros, Ana Ribau, Paulo Pereira, Adélio Vilaça

Serviço de Ortopedia, Centro Hospitalar e Universitário do Porto, Porto, Portugal

Received: 30 August 2019

Revised: 12 September 2019

Accepted: 14 September 2019

***Correspondence:**

Dr. Joao Esteves,

E-mail: saludaes@gmail.com

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ABSTRACT

We present a 23-year-old male with an early anterior cruciate ligament (ACL) reconstruction failure due to lateral wall blow-out, diagnosed on day one post-op. We were able to perform the revision using the original graft, and maintaining the initial tibial fixation, revising only the femoral fixation. At 1-year follow-up the patient is asymptomatic. In the early ACL reconstruction failures due to femoral wall blowout, it is possible to perform the revision surgery using the same graft and maintaining the same tibial fixation. This avoids de morbidity of a new graft harvest and the need for a new tibial tunnel.

Keywords: Anterior cruciate ligament reconstruction, Anterior cruciate ligament revision, Graft preservation, Wall-blowout

INTRODUCTION

Femoral tunnel blowout is a relatively uncommon complication. More commonly the blow-out occurs in the posterior wall, during tunnel reaming, with a reported incidence of 1.2%.¹ The overreaming of the femoral tunnel may result in lateral wall weakness and to its fracture.²

Most cases occur intra-operatively and are immediately noticed. Usually the surgeon perceives the graft loosening and the loss of fixation. The fixation method can then be changed for a suspensory fixation, a screw post technique, or an outside-in screw fixation.³ Nonetheless, some cases are only diagnosed after the surgery, and in those cases different strategies have to be used. In most cases a revision surgery is needed with a new graft and new fixation and, in some cases, there might be necessary a 2-stage revision.⁴

CASE REPORT

A 23 years old male was referred to our hospital after he had suffered an indirect trauma to the right knee, playing soccer a few months before. He presented with pain and instability of the right knee. After clinical exam he had a suspicion of anterior cruciate ligament (ACL) rupture and underwent an MRI that confirmed it. After 3 months of physical therapy maintained the knee instability and so was proposed to an ACL reconstruction.

He underwent single bundle reconstruction with hamstrings. The surgeon used 2 arthroscopy ports, one medial and one lateral, with no accessory medial port.

The femoral fixation was with a suspensory button and the tibial fixation with an interference screw. Intra-operative graft fixation was satisfactory, with good stability after cyclic load. No complications were noted.

In the same day, hours after the surgery, the patient complains of sudden pain after bed mobilization. On physical exam it was noticeable anterior instability.

He immediately performed a CT-scan that revealed femoral tunnel wall blow-out with loosening of the button (Figure 1 and 2). He was then proposed for revision surgery.



Figure 1: Pre-operative X-ray, the button in an anomalous position, probably due to wall blow out; (A) lateral view, (B) antero-posterior view.



Figure 2: Pre-operative CT, the intraosseous button; (A) coronal; (B) sagittal; (C, D) axial.

The surgical plan consisted of two main options. Revision surgery with a new graft or revision surgery with the same graft. We decided to preserve the graft. He was operated 48 hours later.

Arthroscopy was performed through the previous incisions. It was possible to identify the loose graft and to pull it out through the medial port. Tibial fixation was stable and so only femoral revision was performed. The previous suspensory system was removed and replaced with a new one using the Open TightRope ABS system (Arthrex®).

For the tunnel revision it was used an outside-in technique, with retrograde drill, to ensure a proper fixation of the button on the femoral cortex and to avoid the pre-existing hole. After the tunnel was drilled, the button was passed through it and fixed on the cortical and the graft was tensioned (Figure 3). After surgery both the Lachman and the pivot shift tests were stable.

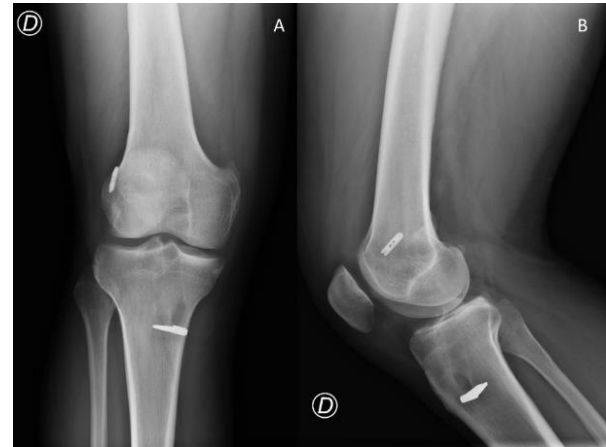


Figure 3: One year post-operative X-ray, a well-positioned button; (A) antero-posterior view; (B) lateral view.

We have now one-year follow-up, the knee is stable and the patient refers no more instability episodes. We performed an MRI that shows a well-placed tunnel with an integrated graft.

DISCUSSION

Errors in surgical technique related to tunnel placement and graft fixation are the most common cause of failure in ACL reconstruction.^{5,6}

When planning the revision surgery, the location of the previous tunnels should be assessed with preoperative imaging. Both MRI and CT scan can be useful in evaluating prior tunnel position. There can be tunnel positioning mistakes in both femur and tibia, with an anterior femoral tunnel placement being the most common error.⁷ In our case, the tunnel properly positioned, and probably there was an over reaming of the femoral tunnel leading to a femoral lateral wall fragility and later blow-out. The femoral wall blow-out is estimated to occur in 1.2% of the reconstructions with hamstrings.¹

Most cases occur intra-operatively and are immediately noticed. The particularity of this case is that it was only diagnosed after the surgery. The authors have found no cases like this described in the literature.

Despite being a revision surgery, because it was very early, it was possible to preserve the graft and avoid the morbidity of a new harvest.

CONCLUSION

In the early ACL reconstruction failures due to femoral wall blowout, it is possible to perform the revision surgery using the same graft and maintaining the same tibial fixation. This avoids de morbidity of a new graft harvest and the need for a new tibial tunnel.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

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Cite this article as: Esteves J, Rosa JM, Barros L, Ribau A, Pereira P, Vilaça A. How to repair an immediately post-operative anterior cruciate ligament reconstruction failure? About a clinical case. *Int J Res Orthop* 2019;5:1219-21.