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Anterior cruciate ligament reconstruction in patients over 50 years of age

David Figueroa *, Francisco Figueroa, Rafael Calvo, Alex Vaisman, Gonzalo Espinoza, Federico Gili

Knee Surgery Unit, Orthopaedics and Traumatology Department, Clínica Alemana — Universidad del Desarrollo, Santiago, Chile

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ABSTRACT

Purpose: To describe the clinical outcomes of patients over 50 years of age with following anterior cruciate ligament (ACL)reconstruction for acute rupture.
Methods: A prospective series of patients over the age of 50 years with a diagnosis of ACL rupture who underwent ACL reconstruction was examined. Lysholm and International Knee Documenting Committee (IKDC) subjective scores were assessed preoperatively and at the final follow-up. All associated injuries were documented, and complications were reported. The patients' satisfaction and return to sports were documented. The statistical analyses were preformed with Student's t-tests for independent samples.
Results: Fifty patients with a mean age of 52.12 years (50–64) and a mean follow-up period of 53.17 months (36–68) exhibited a mean postoperative Lysholm score of 93.7 (60–100) and IKDC score of 90.96 (57.5–100). Associated injuries occurred in 90% (45) of the patients and included the following: 76% (38) meniscal tears and 36% (18) osteochondral lesions. Complications occurred in 6% (3) of the patients and included the following: 4% (2) ACL re-ruptures and 2% (1) infections. Among all patients, 88% (44) returned to pre-injury sports levels, and 96% (48) were satisfied.
Conclusions: For patients above the age of 50 years, ACL reconstruction appears to be a safe procedure with good to excellent results that are comparable to those for younger patients, and the possibility for returning to pre-injury sports levels for these patients is high.

1. Introduction

Anterior cruciate ligament (ACL) reconstruction is one of the most widely performed orthopaedic procedures, and its success rate in younger patients ranges from 85% to 95%.[1] Historically, older patients with ACL ruptures have been treated conservatively and urged to modify their physical activities.[2,3]

Recent studies seem to demonstrate that conservative treatment is not associated with good results because such treatment might lead to increased risks of residual instability and associated injuries.[4,5] Moreover, patients must cope with their instability, and many go on to abandon highly demanding sport activities.

Several studies have shown that, in middle-aged populations with ACL tears, selected and motivated patients can experience considerable recovery of function and stability after surgical reconstruction and predictably return to cutting and pivoting sports.[6–13] This growing body of evidence has broadly changed the approaches of surgeons toward the management of ACL-deficient knees in older patients.

The purpose of this investigation was to describe the clinical outcomes of patients over 50 years of age with an acute ACL rupture who underwent ACL reconstruction and to document the associated injuries.

We hypothesised that active patients older than 50 years with reconstructed ACLs would have good to excellent functional results.

2. Material and methods

This study examined a prospective, consecutive series of patients over 50 years of age with a clinical and imaging (magnetic resonance imaging [MRI]) diagnosis of an ACL rupture that was treated with ACL reconstruction from January 2007 to December 2010. The study was approved by the ethics committee of our institution, and all patients provided written informed consent to participate in this study.

The surgical technique involved standard ACL reconstruction that was performed by the surgeons of our Knee Surgery Department. The procedure consisted of a transtibial ACL reconstruction using hamstring autografts or allografts when the diameters of the harvested tendons were small. All identified chondral lesions were treated with mechanic debridement and chondroplasty. All meniscal lesions were treated with partial menisectomies.

The inclusion criteria were the following: patients over the age of 50 years who performed sporting activities regularly, with a clinical and MRI diagnosis of ACL rupture, and ACL ruptures of less than 3 months duration.

The exclusion criteria were the following: patients younger than 50 years of age, multi-ligament knee injuries, ACL re-ruptures,

* Corresponding author at: Clínica Alemana, Vitacura 5951, Santiago, Chile. Tel.: +56 222101011.
E-mail address: franciscofigueroab@gmail.com (D. Figueroa).

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inflammatory joint diseases, limb malalignment, and radiographic changes indicating Ahlbäck type IV to VI knee osteoarthritis.[14]

All patients underwent preoperative physical therapy. The patients were discharged from hospital two days after surgery and followed in the outpatient clinic weekly until one month, monthly until six months and yearly thereafter. The initial rehabilitation protocol consisted of immediate postoperative rest and continuous passive mobilisation twice daily from the first postoperative day in addition to ambulation with two crutches, isometric quadriceps exercises, and manual patellar mobilisation. The steps of the rehabilitation are described in Table 1.

Lysholm [15] and International Knee Documenting Committee [16] (IKDC) subjective scores were assessed before the surgery and at the final follow-up. The levels of sports activity were documented as Tegner activity scores pre-injury and at the final follow-up.[17]

We also documented the presence of associated injuries in our series.

The statistical analyses were preformed with Student's t-tests for independent samples.

3. Results

Fifty patients (50 knees) over the age of 50 years fulfilled the inclusion criteria and were enrolled in the study. Two patients (60 and 65 years old) refused surgery and preferred to undergo conservative treatment and stop their sports activities (these patients were symptomatic only during sports activities).

All 50 patients who choose operative treatment exhibited symptomatic instability during physical activity, and 30 patients (60%) exhibited instability during daily activities. Thirty-three (66%) patients were male, and 17 (34%) patients were female. The mean age was 52.12 years (50–64). The mean follow-up period was 53.17 months (36–68). The types of graft used were hamstring autografts in 45 patients (90%) and allografts (Achilles tendon) in 5 patients (10%). The surgeries were performed at a mean time of 8.4 weeks (4–12) after the injuries.

There were 45 patients (90%) with associated injuries (Table 2). Meniscal lesions were the most common and were present in 38 patients (76%). Isolated lateral meniscal tears were present in 15 patients (30%), isolated medial meniscal tears were present in 13 patients (26%) and combined meniscal tears were present in 10 patients (20%).

Osteochondral defects were present in 18 patients (36%). The most common of these defects were isolated medial femoral condyle lesions in six patients (12%), patellar lesions in five patients (10%) and lateral femoral condyle lesions in three patients (6%). Four patients (8%) had multicompartment osteochondral lesions.

There were three complications that each occurred in a different patient (6%). One (2%) patient experienced a postoperative infection that was treated with arthroscopic lavage and debridement and intravenous antibiotics, which resulted in the preservation of the reconstructed graft. Two (4%) patients experienced ACL re-rupture; one of these re-ruptures occurred at seven months and the other at nine months of follow-up. Both were treated with revision ACL reconstruction with an allograft (Achilles tendon). No patients were treated for postoperative arthrofibrosis or deep-vein thrombosis (DVT).

In Table 3, we present the clinical scores of our series. The mean preoperative Lysholm Score was 50.1 points (30–65). The mean preoperative IKDC score was 42.9 (19.5–52.9). The mean preoperative Tegner score was 5.8 points. (5–6)

The mean postoperative Lysholm score was 93.7 points (60–100). The mean IKDC score was 90.96 (57.5–100). Both of these scores were significantly better than the corresponding preoperative scores ($p = 0.0007$ and $p = 0.0009$, respectively). The largest gains among these scores occurred in the instability, swelling and physical activity items.

Table 2
Associated injuries.

Lesion	N (%)
Meniscal injuries	38 (76)
Medial	13 (26)
Lateral	15 (30)
Both	10 (20)
Osteochondral lesions	18 (36)
LFC	3 (6)
MFC	6 (12)
Patellar	5 (10)
Multicompartimental	4 (8)

LFC: Lateral Femoral Condyle, MFC: Medial Femoral Condyle.

Forty-four patients (88%) returned to their pre-injury sports level. The mean Tegner score was 5.6 points (5–6) ($p = 2.2136$). Forty-eight patients (96%) were satisfied with their results.

4. Discussion

This clinical series demonstrated great improvements in the clinical scores (i.e., the Lysholm and IKDC scores) of patients over the age of 50 years with ACL ruptures who were treated with arthroscopic reconstruction. These findings refute the previous idea that similar groups of patients do not require surgical treatment.[3,4] These results are comparable to previously reported results regarding young and middle-aged patients.[18,19] This series also demonstrated a high rate of returning to sports and patient satisfaction. In contrast, conservative treatment has a limited ability to achieve complete returns to pre-injury sports activity levels particularly for sports that require pivoting activities.[4,5]

In recent years, various studies focusing on ACL reconstructions in patients over the age of 40 years have been published [6–13] and have made arthroscopic reconstruction the preferred treatment for physically active patients in this group (presently, this includes nearly everybody in this age group); however, little has been published regarding patients older than 50 years [20–22], which makes the decision between surgical and non-surgical treatments more difficult for clinicians. Regardless, the few available studies have provided support for surgical treatment, which appears to have better clinical results particularly in more athletic older populations who cannot accept the residual instability and limitations related to the conservative treatment of ACL ruptures.

The presence of significant osteoarthritis or limb malalignment might affect the results of ACL reconstruction. We excluded patients with signs of advanced osteoarthritis or clinical and radiologic malalignment from our series. Although the majority of our patients had concomitant preoperative meniscal or chondral injuries, the clinical

Table 1
Rehabilitation protocol after ACL reconstruction.

	Immediate POP	First day POP	First week POP	Third week POP	Fourth week POP	Second month POP	Sixth-eight month POP
Mobility	0°–90° in PCM	0° to 100°–120°	0°–120°	Complete	Complete	Complete	Complete
Walking	–	Assisted (2 crutches)	Assisted (2 crutches)	Assisted (1 crutch)	Free	Free	Free
Therapy	–	Patellar mobilization Quadriceps isometrics	Free ROM Patellar mobilization TENS Cryotherapy	Free ROM Patellar mobilization Quadriceps strengthening TENS Cryotherapy	Free ROM Patellar mobilization Quadriceps strengthening TENS Cryotherapy	–	–
Gym	–	–	–	–	Stationary bicycle Treadmill walk	Stationary bicycle Treadmill walk Dumbbell work	–
Sports	–	–	–	–	Swimming	Swimming Soft jogging	Return to sports

POP: postoperatively; PCM: passive continuous motion; ROM: range of motion; TENS: transcutaneous electrical nerve stimulation.

Table 3
Lysholm, IKDC and Tegner scores.

	Preoperative	Postoperative	P value
Lysholm score	50.1	93.7	0.0007
IKDC score	42.9	90.9	0.0009
Tegner score	5.8	5.6	2.2136

IKDC: International Knee Documenting Committee.

and functional outcomes were not affected, which indicates that initial osteoarthritis is not likely to be a contraindication for the reconstruction of a torn ACL.

One reason for the hesitation to perform ACL reconstructions in older patients is the out-dated notion that this group would experience a greater number of complications than would younger patients. In our series, we observed a 4% re-rupture rate, and this rate is comparable to the published values than range from 0.7 to 10%.[23,24] Both of the patients who experienced re-ruptures were treated with revision ACL surgery and exhibited outcomes that were similar to those of the other patients at the final follow-up. We had one case of infection (2%), which resulted in an infection rate that is also comparable to the rates reported in the literature that range from 0.3 to 1.7%[25,26], although our rate falls in the upper part of this range. Based on these results, this procedure appears to be safe for this group of patients regardless of their older age, and the observed complication rate was comparable to that for younger patients.

The limitation of this study is that, based on the positive results that have been reported in the literature, we offered surgical treatment to all patients with ACL ruptures who wanted to return to their previous sports activities regardless of age. Thus, during the period over which this study was conducted, only two of our patients declined to undergo ACL reconstruction. Thus, we lacked a control group to compare to our surgically treated patients.

5. Conclusion

ACL reconstruction in patients over the age of 50 years appears to be a safe procedure with good to excellent results that are comparable to the results observed in younger patients, and the possibilities for this older group to return to pre-injury levels of sports activities are high.

Conflicts of interest

The authors declare that they have no conflicts of interest.

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