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Clinical outcomes after arthroscopic treatment of knee osteoarthritis

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ABSTRACT

Purpose: The aim of this study was to describe the clinical outcomes of patients with knee osteoarthritis (OA) treated with arthroscopic surgery, documenting the associated injuries and defining the type of treatment selected for OA patients with different symptoms.
Hypothesis: Knee arthroscopy is effective for treating patients with symptomatic OA and mechanical symptoms.
Methods: This was a prospective, consecutive series of 100 patients with a clinical and radiological diagnosis of OA who were treated with knee arthroscopy. The average follow-up time was 35.9 months (25–71), and the average age was 60.1 years (50–83). *Inclusion criteria*: >50 years of age, a clinical imaging diagnosis of knee OA with an Ahlbäck I–III classification. *Exclusion criteria*: <50 years of age, Ahlbäck IV, pathologic lower limb mechanical axis and inflammatory joint diseases. The IKDC and Lysholm scores were assessed before and after surgery.
Results: The preoperative average scores were as follows: Lysholm, 56.9 ± 13.5 points (22–71); IKDC, 59.4 ± 21.7 points (45–80). The postoperative average scores were as follows: Lysholm, 86.9 points (22–87); IKDC, 79.5 points (45–100). Regarding the Lysholm scores, 76% were good and excellent results and 24% were moderate ($p = 0.045$). The associated injuries included 48% of chondral and 36% of unstable meniscal injuries. Good or excellent results were observed in 76% of the meniscal injury cases according to the Lysholm scores, while only 84.6% of the cases with unstable chondral lesions had good or excellent results ($p = 0.035$).
Conclusion: Most patients with knee OA associated with unstable cartilage or meniscal injuries reported good-to-excellent symptomatic results at the short- and mid-term follow-ups.
Level of evidence: III

1. Introduction

Knee osteoarthritis (OA) is a prevalent disease in people older than 50 years of age and is considered the second most frequent cause of disability after cardiovascular disease [10]. This condition is an expression of a degenerative process involving the hyaline cartilage that is clinically manifested by pain, swelling and functional limitation secondary to the loss of normal joint function [3,11,12].

When medical treatment for the management of pain secondary to OA of the knee fails, arthroscopic toilet procedures (washing and cleaning the joints) can be considered [13,1,15,7–9,16].

However, the role that arthroscopic treatment plays remains controversial due to the diverse results described by different authors in the literature. Currently, there is no consensus regarding the true benefits of this procedure in the treatment of knee OA [13,1,15,7–9,16].

Some authors, such as Edelson et al. [7], have analyzed the effect of arthroscopic debridement in patients with advanced knee OA. They have concluded that there is a reduction of pain and symptoms in the mid- to long-term follow-up, contrasting with other studies indicating that the benefits of this treatment would be evident only in the short term [1,15,8]. Others suggest that arthroscopic treatment for pain management in OA of the knee is not justified because it does not provide a greater benefit than the results obtained with medical therapy (non-steroidal anti-inflammatory treatment, joint supplements and physiotherapy) [16,14].

The purpose of this study is to describe the clinical outcomes of patients with knee OA treated with arthroscopic surgery and to document the associated injuries and define the type of treatment selected for OA patients with different symptoms. Our hypothesis was that knee arthroscopy might be an effective treatment for patients with symptomatic knee OA and joint mechanical symptoms.

2. Methods

We performed a prospective study in a consecutive series of 100 patients undergoing knee arthroscopy with a clinical and radiological

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diagnosis of OA who were all treated at the same hospital by the same consultants. The inclusion criteria were as follows: >50 years of age, a clinical and imaging (radiographic and magnetic resonance image) diagnosis of knee OA, an Ahlbäck I–III classification [2] and short-term clinical symptoms (less than 6 months). The exclusion criteria included the following: <50 years of age, Ahlbäck IV, a pathologic lower limb mechanical axis, associated ligament injuries and inflammatory joint diseases. Of the 100 patients studied, 50 were male and 50 were female, and the average age was 60.1 years (range,50–83 years) at the time of surgery. The Lysholm and International Knee Documenting Committee (IKDC) subjective scores were assessed before and after surgery. We described the associated injuries found during arthroscopy and the association between age and the functional result. We classified our results regarding Lysholm scores as excellent (95–100), good (85–94) and moderate (<84) [17].

We evaluated our results with parametric tests for independent samples at the rate of normal distribution of continuous data (T test).

2.1. Surgical technique

All patients were treated with toilet arthroscopy and debridement (Fig. 1A and B). For patients with unstable cartilage lesions, thermal chondroplasty with bipolar radiofrequency (Arthrocare®, Austin, TX, USA) or mechanical chondroplasty with an arthroscopic shaver was performed (Fig. 1C). All of the unstable meniscal lesions underwent a partial meniscectomy with a common technique (basket resection, shaver and Arthrocare® stabilization) (Fig. 1D).

In the postoperative period, cryotherapy was used for 24 h, and mobilization and partial discharge with two forearm crutches were then allowed under the supervision of a physical therapist. Following discharge, all patients underwent a similar rehabilitation program based on strengthening and stretching the quadriceps and hamstring muscles, progressively reestablishing muscle balance and the normal range of motion.

3. Results

The average follow-up period was 35.9 months (25–71). The Ahlbäck classifications included 10 Ahlbäck I, 76 Ahlbäck II and 14 Ahlbäck III cases. The average scores in the preoperative period were as follows: Lysholm, 56.9±13.5 points (22–71); IKDC, 59.4±21.7 points (45–80). The average scores in the postoperative period were as follows: Lysholm, 86.9±15.5 points (22–87); and IKDC, 79.4±24.7 points (45–100) (Table 1). Among the associated injuries, isolated unstable cartilage injuries occurred in 48 out of 100 patients (48%), and unstable meniscal tears occurred in 36 out of 100 patients (36%), among which 20 out of 36 (56%) of the injuries were in the medial meniscus, 6 out of 36 (17%) lesions were in the lateral meniscus and 10 out of 36 (28%) lesions were bilateral. Unstable cartilage lesions were stabilized with only bipolar radiofrequency in 16 out of 48 (33%) of the cases, with mechanical chondroplasty in 24 out of 48 (49%) cases and with both in 8 out of 48 (18%) cases. All meniscal tears were treated with a partial meniscectomy. Good or excellent scores were reported for 27 out of 36 (76%) of the cases with meniscal injuries using the Lysholm score, while 31 out of 36 (85%) patients with unstable cartilage lesions ($p=0.035$) reported good or excellent scores. The group of patients between 50 and 70 years of age had better results after surgery. However, the functional results did not significantly improve in patients older than 70 years of age (Tables 2 and 3).

4. Discussion

Currently, there is no consensus on the true value of knee arthroscopy in the treatment of OA [6,18]. In our series, in patients who had mild-to-moderate OA according to the Ahlbäck classification, good and excellent results were observed over the short-term follow-up period following knee toilet arthroscopy and debridement. According to the study described by Ibarra et al. [10] regular results are generally associated with

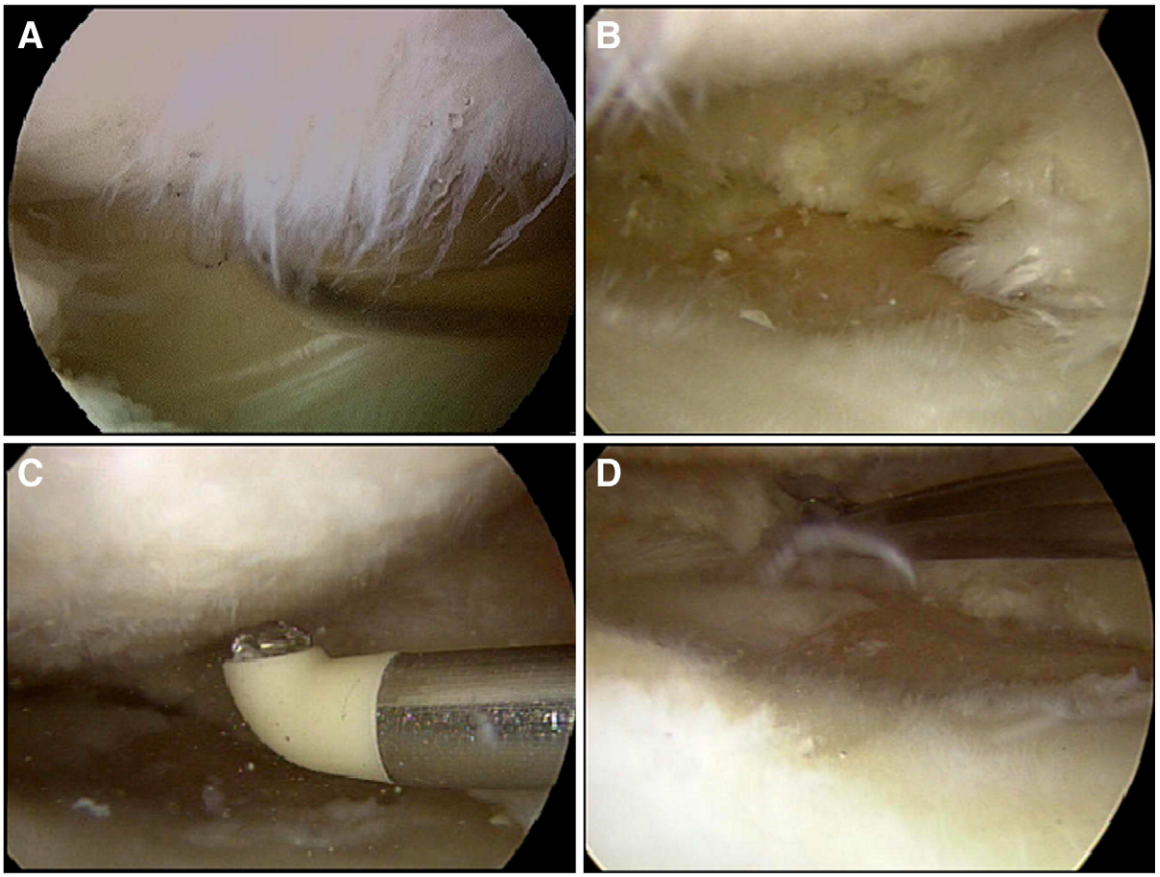

Fig. 1. A and B: Arthroscopic view of a knee with osteoarthritis. C: Arthroscopic view of thermal chondroplasty with bipolar radiofrequency. D: Arthroscopic view of partial meniscectomy.

Table 1
Preoperative and postoperative scores in all patients that underwent knee arthroscopy.

	Preoperative Lysholm score	Postoperative Lysholm score	p value	Preoperative IKDC score	Postoperative IKDC score	p value
All cases (100)	56.9 ± 13.5	86.9 ± 15.5	0.03	59.4 ± 21.7	79.4 ± 24.7	0.02
Meniscal lesions (36)	55.1 ± 8.4	86.7 ± 9.6	0.02	52.3 ± 11.4	79.6 ± 12.7	0.02
Chondral lesions (48)	56.3 ± 7.2	87.2 ± 14.5	0.02	53.9 ± 9.4	76.7 ± 12.7	0.01

Table 2
Preoperative and postoperative Lysholm scores according to age group.

Age range	Number of patients	Preoperative Lysholm score	Postoperative Lysholm score	p
50–60 years	59	56.7 ± 10.5	83.9 ± 15.5	0.01
60–70 years	21	57.9 ± 11.2	81.9 ± 11.5	0.01
70–80 years	14	57.9 ± 9.5	79.9 ± 7.3	0.06
>80 years	6	62.9 ± 13.5	78.9 ± 3.5	0.09

Table 3
Preoperative and postoperative IKDC scores according to age group.

Age range	Number of patients	Preoperative IKDC score	Postoperative IKDC score	p
50–60 years	59	60.4 ± 17.7	80.9 ± 15.2	0.01
60–70 years	21	57.9 ± 9.2	79.9 ± 9.1	0.04
70–80 years	14	58.9 ± 6.5	79.9 ± 7.7	0.08
>80 years	6	64.9 ± 13.5	75.9 ± 3.3	0.07

another injury, patient age, associated knee diseases, the level and the type of activity that the patient performs, body mass index and compliance with an appropriate rehabilitation program.

Several studies suggest that knee arthroscopy plays no role in OA treatment. In a randomized study of 180 patients with knee OA, Mosley et al. [16] compared toilet arthroscopy with joint debridement to placebo and found no statistically significant differences between the groups. It is important to mention that, within the broad criticism that this study received, the rating scale used was the Specific Knee Pain Scale, which is not validated in the literature; therefore, the interpretation of their results might be different. Similar results were obtained by Kirkley et al. [14] who compared arthroscopic treatment vs. medical and rehabilitation therapy (drugs and rehabilitation) vs. medical therapy alone (medication including acetaminophen, non-steroidal anti-inflammatory injection, intra-articular hyaluronic acid and rehabilitation including physiotherapy) in a randomized clinical trial of 86 patients with knee OA; no statistically significant differences were found between the groups at a 2-year follow-up. The rating scale used by this group was the Western Ontario and McMaster Universities Osteoarthritis (WOMAC) score [4].

Other studies, however, report a symptomatic improvement in patients with osteoarthritis who underwent arthroscopic surgery. In a study performed by Edelson et al. [7], 23 patients (29 knees) who underwent toilet arthroscopy reported decreased pain at a short-term follow-up examination. To analyze their results, they used the Hospital for Special Surgery Knee Score, the Knee Society Pain Score and the Visual Analog Scale for pain.

Aaron et al. [1] suggested that, when comparing the results of toilet arthroscopy in patients with knee OA, it is crucial to separate patients into subgroups using age, the severity of OA and associated injuries, especially cartilage lesions, because each of these variables influences postoperative outcomes. In our series, patients older than 70 years of age did not have significantly improved functional scores after surgery.

The American Academy of Orthopaedic Surgeons recommends that arthroscopic lavage or debridement (or both) and meniscal resection be performed only in patients with mechanical symptoms, such as sudden onset of inability to fully extend the knee or repeated disabling catching or locking [5].

In our study, patients with associated injuries to the meniscus and cartilage showed good and excellent results at a higher percentage (76% and 84.6%, respectively). However, the reason for this difference between groups is unclear. To our knowledge, the results of arthroscopy for the treatment of knee OA offer good and excellent results over short- and mid-term follow-up periods in selected patients with associated injuries and an Ahlbäck classification of I–III.

We believe that patients with knee OA who are candidates for knee arthroscopy should be carefully selected in terms of the severity of the pathology and other associated factors to ensure success in the long-term postoperative results.

The weaknesses in this study include the lack of case randomization and the non-homogeneity of the study group with respect to the associated injuries. Additionally, no long-term follow-up evaluation was included in the study.

5. Conclusion

This selected group of patients, with knee OA associated with unstable cartilage or meniscal injuries, reported good-to-excellent symptomatic results at short- and mid-term follow-up visits after arthroscopic debridement and stabilization of both meniscal and cartilage lesions.

6. Conflict of interest

I declare that I and my co-authors have no conflicts of interest in submitting this manuscript and have not received any financial support for carrying out the research or preparing the manuscript.

References

[1] Aaron RK, Skolnick AH, Reinert SE, Ciombor DM. Arthroscopic debridement for osteoarthritis of the knee. J Bone Joint Surg Am 2006;88:936-43.
[2] Ahlbäck SO. Classification of hip joint arthrosis. Nord Med 1971;85(5):157-8.
[3] Baumgaertner MR, Cannon Jr WD, Vittore JM, Schmidt ES, Maurer RC. Arthroscopic debridement of the arthritic knee. Clin Orthop 1990;253:197-202.
[4] Bellamy N, Buchanan WW, Goldsmith CH, Campbell J, Sititt LW. Validation study of WOMAC: a health status instrument for measuring clinically important patient relevant outcomes to antirheumatic drug therapy in patients with osteoarthritis of the hip or knee. J Rheumatol 1988;15:1833-40.
[5] Benell KL, Hunter DJ, Hinman RS. Management of osteoarthritis of the knee. BMJ 2012;345:e4934.
[6] Dervin GF, Stiell IG, Rody K, Grabowski J. Effect of arthroscopic debridement for osteoarthritis of the knee on health-related quality of life. J Bone Joint Surg Am 2003;85:10-9.
[7] Edelson R, Burks RT, Bloebaum RD. Short-term effects of knee washout for osteoarthritis of the knee. Am J Sports Med 1995;23(3):345-9.

[8] Hanssen A, Stuart M, Scott R. Surgical options for the middle aged patient with osteoarthritis of the knee joint. J Bone Joint Surg 2000;82-A:1768-78.
[9] Hunt SA, Jarawi LM, Sherman OH. Arthroscopic management of osteoarthritis of the knee. J Am Acad Orthop Surg 2002;10(5):356-63.
[10] Ibarra CJ, Cabrales M, Crisótomo JF, Almazán A, Cruz F, Encalada MI, et al. Resultados obtenidos obtenidos con la limpieza articular de rodilla en pacientes con osteoarthritis. Acta Ortop Mex 2009;23(2):85-9.
[11] Ioannidis G. The current role of the arthroscopy in the treatment of osteoarthritis of the knee. Curr Opin Orthop 2004;15:31-6.
[12] Jackson RW, Silver R, Marans H. Arthroscopic treatment of degenerative joint disease. Arthroscopy 1986;2:114.
[13] Kelly MA, Dalury DF, Kim RH, Backstein D. The new arthritic patient and nonarthroplasty treatment options. J Bone Joint Surg Am 2009;91(5):40-2.
[14] Kirkley A, Birmingham TB, Litchfield RB, Giffin JR, Willits KR, Wong CJ, et al. A randomized trial of arthroscopic surgery for osteoarthritis of the knee. N Engl J Med 2008;359:1097-107.
[15] McLaren AC, Blokker CP, Fowler PJ, Roth JN, Rock MG. Arthroscopic debridement of the knee for osteoarthrosis. Can J Surg 1991;34:595-8.
[16] Mosley JB, O'Malley K, Petersen NJ, Menke TJ, Brody BA, Huykendall DH. A controlled trial of arthroscopic surgery for osteoarthritis of the knee. N Engl J Med 2002;347:81-8.
[17] Tegner Y, Lysholm J. Rating systems in the evaluation of knee ligament injuries. Clin Orthop Relat Res 1985;198:43-9.
[18] Yang SS, Nisonson B. Arthroscopic surgery of the knee in the geriatric patient. Clin Orthop Relat Res 1995;316:50-8.