

Partial Distal Release of The Iliotibial Band in Treating Non-Prosthetic Valgus Gonarthrosis: A Preliminary Study

Daniel Lauxen Junior* and Joao L Ellera Gomes

Department of Orthopedics, Brazil

*Corresponding author: Daniel Lauxen Junior, Department of Orthopedics, Brazil.

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Abstract

Background: The purpose of this study is to evaluate the effect of the partial release of the iliotibial band in patients who have undergone arthroscopic meniscectomy in treating moderate to severe lateral osteoarthritis (Kellgren and Lawrence grades 3 and 4) and valgus knee deformity.

Methods: The study group consisted of patients originally presenting with genu valgum and lateral osteoarthritis (Kellgren and Lawrence grades 3 and 4) secondary to malalignment, with no more than 20 degrees of valgus according to the Lysholm Scale and who had also been evaluated on the Visual Analog Scale (VAS). These evaluations were conducted again in post-operative follow-up after 24 months. All patients were submitted to arthroscopic debridement of the lateral meniscus and cartilage before the distal lateral release of the iliotibial band was performed, as well as a partial tibial marginal capsular liberation.

Result: In 20 cases, the Lysholm Functional Scale mean improved from 62,2 to 82,2 points. The VAS mean in the preoperative period was 8,45 and reached 2,75 at follow-up after 24 months.

Conclusion: Partial release of the iliotibial band brought pain relief and helped patients return to their daily activities far more effectively than would have been expected from simply having isolated meniscectomies, according to results described in the literature.

Keywords: Osteoarthritis; Genu Valgum; Iliotibial Band; Knee

Introduction

Treatments for knee valgus, and especially in polio patients, have led to techniques for the total or subtotal release of the iliotibial band. [1,2] While polio has almost been eradicated, subtotal release has mainly been used to treat ligament balancing in knee athroplasty. With non-prosthetic patients, however, this option is rarely considered, even in those cases where a lateral interline narrowing and medial opening reveals an axis deviation and significant constriction in the coronal plane. Frequently, patients with lateral osteoarthritis and knee valgus suffer from a shortening

of lateral structures which in some cases can be partially reduced or fixed. [3] In theory, this shortening may contribute to increased pressure in the lateral compartment and worsened symptoms. A 2013 biomechanical study demonstrated significant increase of tibiofemoral lateral joint loads and valgus tibial rotation with simultaneous medial tibiofemoral load reduction when the iliotibial band load was increased. [4] Reversing these same forces comports with our hypothesis that a lateral release of the iliotibial band would decrease lateral compartment pressures in the knee. To our

knowledge, there is no report of distal release of the iliotibial band in treating osteoarthritis. However, several techniques employ the release of the iliotibial band in non-prosthetic treatment of iliotibial band syndrome and have proven to be low risk. [5-8] The objective of this study is to evaluate if adding the partial distal release of

the iliotibial band to arthroscopic meniscectomy surgery in cases of moderate to severe lateral osteoarthritis and knee valgus could offer better outcomes than isolated arthroscopic debridement alone.

Methods

Table 1: Study population

Variables	n=20
Osteoarthritis grade (Kellgren and Lawrence Scale) – n (%)	
3	12(60.0)
4	8 (40.0)
Valgus Deformity – n (%)	
< 10 degrees	12(60.0)
Between 10 and 20 degrees	8 (40.0)

In this prospective study, the participants were patients who suffered from lateral gonarthrosis and knee valgus with femorotibial mechanical axis (FTMA) measured by full-leg, anteroposterior, weight-bearing radiographs. Participants were physically active, presented symptoms of lateral meniscus tears confirmed by MRI, and Kellgren and Lawrence osteoarthritis grades of 3 or 4. Ten female and ten male patients were included with an average age of 61.5 years ranging from 51 to 72 (Table 1). Twelve patients showed between 0 and 10 degrees of valgus in the FTMA, and eight patients showed between 10 and 20 degrees (Table 1).

All patients were submitted to MRI exams to confirm the clinical findings. Clinical exams showed no flexion contracture in Minimum Extension Deficit Tests, [9] and stress radiographs were used to assess lateral and medial opening differences. [10,11]

The most common clinical finding beyond genu valgum was lateral crepitus under valgus stress. MRI exams generally showed degenerated lateral meniscus and damage to the femoral and tibial lateral compartment cartilage and subchondral bone. As noted, all patients maintained some degree of physical activity, and wanted to avoid prostheses (Figure 1,2).

The patients were submitted to lateral debridement and lateral infra-meniscal capsular release close to the tibia (Figure 1), to which was added an iliotibial band release procedure, as described below, to delay the need for total knee arthroplasty. In addition to the arthroscopy portals, a 2 cm horizontal skin incision was made for the transversal release of the anterior two-thirds of the iliotibial band at the level of the distal femur (Figure 2).

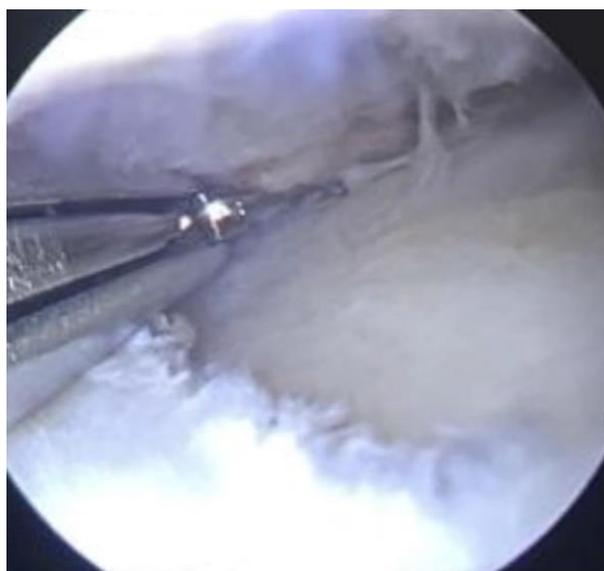


Figure 1:

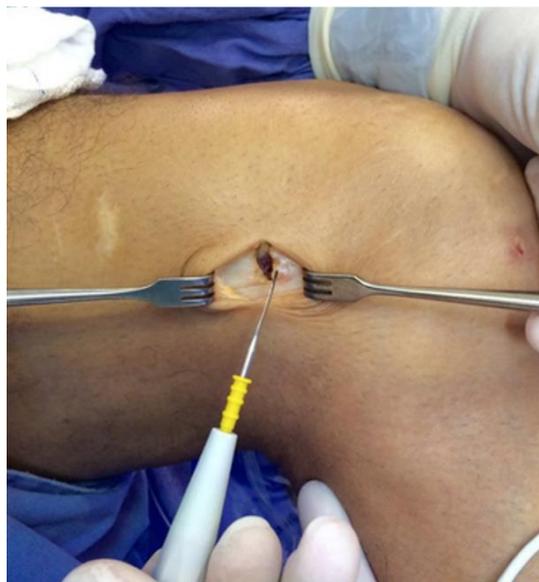


Figure 2:

Pain level was assessed with the Visual Analog Scale (VAS) and limitation to everyday activities was assessed with the Lysholm Scale, both prior to surgery and after 24 months in postoperative follow-up. This research was approved by the Ethics Committee of our institution under number 2015-0485.

Statistical Analysis

The quantitative variables were described in average and standard deviation along with the median for asymmetrical distribution variables, while the categorical variables were described in absolute and relative frequencies. The distribution of data was analyzed with the Shapiro-Wilk test. To compare the pre- and post-intervention averages, the Student's T-test for paired samples was used. In cases of asymmetry, the Wilcoxon test was used. The level of significance used was 5% ($p < 0.05$), and the analyses were performed with SPSS software (version 21.0).

Result

Patients were evaluated every month in the first 6 months after surgery, but the preoperative scores were only compared in this study with the final scores at 24 months after procedure. The patients' average preoperative score was 62 (± 4.9) on the Lysholm Scale and 8.4 (± 0.5) on the VAS. While this may seem to be a high VAS score for gonarthrosis, the patients were instructed to rate their pain during physical exercise instead of normal daily activities both before and after the surgery. Only two patients found no improvement in their symptoms after the procedure, and none showed signs of instability or laxity. There was an average improvement of 23 points on the Lysholm Scale and a decrease of 5.7 points on the VAS in follow-up after 24 months (Table 2). In six cases, postoperative radiographs showed undeniable improvement in ligament balance (Figure 3). (Figure 3) (Table 2).



Figure 3:

Table 2: Pre- and post-operative results.

Variables	Pre-op	Post-op	Difference (CI 95%)	p
	Mean ± SD	Mean ± SD		
Functional Scale (Lysholm)	62.2 ± 4.9	85.2 ± 8.3	23.0 (19.8 a 26.2)	<0.001*
Pain Scale VAS [median]	8.45 ± 0.51[8]	2.75 ± 2.40[2]	-5.70 (-6.72 a -4.68)	<0.001†

SD: Standard Deviation; CI: Confidence Interval; VAS: Visual Analog Scale

*paired: t-test; †Wilcoxon's test

Discussion

Nearly 25% of the patients with knee valgus and lateral osteoarthritis present shortening in the lateral soft tissues which sometimes makes this deformity irreducible. [3] In patients submitted to total knee arthroplasty, there are many possible procedural sequences that may be undertaken in the release of the lateral soft tissues. [12-14] This presents such a problem that several authors argue for the release of the iliotibial band to be the initial procedure. [15-17] What is more, adequate success rate and return to normal physical activity has already been documented in several isolated release techniques of the iliotibial band in non-prosthetic patients for treatment of iliotibial band friction syndrome. [5, 6, 18, 19] At the same time, studies evaluating arthroscopy for gonarthrosis demonstrate feeble and short-lasting results [20-24] that are inferior to the those presented in this study. We could not find in the literature any study or reference regarding the use of partial release of the iliotibial band for pain relief in patients with gonarthrosis who have not undergone arthroplasty.

In this preliminary study, the addition of partial release of the iliotibial brought more pain relief and a faster return to physical activities than what would be expected after arthroscopy alone and did so with minimal invasiveness. Although arthroscopy is not the ideal treatment for patients with lateral gonarthrosis, all patients in this study requested a less aggressive approach for different reasons. The results were encouraging especially for patients with a moderate degree of osteoarthritis. Therefore, from now on we intend to collect data on a group of patients with initial-to-mild degeneration of the lateral compartment as the results may be even better at other stages of osteoarthritis progression. A few limitations of this study include: a small number of participants, the absence of a control group, and insufficient follow-up time in which to evaluate whether the release of the iliotibial band slows the progression of osteoarthritis in these patients.

This study aims to call attention to the possible benefits of treating imbalances in ligament and soft tissue tension in patients who have not undergone arthroplasty. Including the release of iliotibial band tension in arthroscopic surgery for lateral osteoarthritis and knee valgus improved patient's functional outcomes to a better level that is expected after arthroscopy alone. This is especially encouraging because no complication was detected in this study by adding this procedure. Nevertheless, additional, and sequential studies are necessary to confirm these initial findings.

Acknowledgment

None.

Conflict of Interest

No conflict of interest.

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