Clinical results of endoscopic treatment without repair for partial thickness gluteal tears

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ABSTRACT

Introduction: Various surgical treatments have been proposed for greater trochanteric pain syndrome (GTPS) related to gluteal tendinopathy with partial thickness tears. The clinical results of endoscopic debridement without repair of these gluteal tears are not well known. The objectives of this study were to determine if this procedure leads to: (1) reduction of pain, (2) functional improvement, (3) patient satisfaction (on scale of 0 to 10).

Hypothesis: Endoscopic treatment without tendon repair provides short-term pain relief in patients with GTPS due to partial thickness gluteal tears.

Material and methods: Seventeen patients (16 women, 1 man) with GTPS due to partial thickness gluteal tears that was present for at least 6 months and was refractory to conservative treatment were included in the analysis. The average age at the time of the procedure was 53.5 years (17–71). Pain was evaluated with a visual analogue scale (VAS). Functional outcomes were defined using the Harris Hip Score and the UCLA activity score. Satisfaction was evaluated using a VAS and Odom’s criteria.

Results: The average follow-up was 37.5 months (12–48). The average preoperative and follow-up values were respectively: (1) Pain: 7.2 ± 1.1 (5–9) versus 3.3 ± 1.9 (1–7) (P < 0.001), (2) Harris score: 53.5 ± 8.4 (36–68) versus 79.8 ± 14.7 (45–96) (P < 0.001). Seven patients (41.2%) were able to resume sports activities. The average satisfaction score for the surgery was 6.2 ± 2.4 (0–9) at follow-up. Five patients had a poor outcome at the review: four still had pain and one had recurrence of the lateral snapping hip.

Conclusion: Endoscopic treatment without repair of partial thickness gluteal tears is a treatment option with modest clinical results for GTPS patients refractory to conservative treatment.

Level of evidence: IV, retrospective study.

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1. Introduction

Greater trochanteric pain syndrome (GTPS) is a generic term encompassing lateral hip pain conditions that primarily affect middle-aged women (40–60 years) [1,2] with an estimated incidence of 1.8/1000 [3]. Although it has previously been attributed to bursal inflammation, this pain syndrome appears to have other causes [4]. Gluteal tendinopathy could be one of the causes of GTPS [5]. In an MRI study of recurrent GTPS, Bird et al. [6] found a complete gluteus medius tear in 46% of cases and a partial tear in 38%.

Most patients with GTPS respond well to conservative treatment [7,8]. The initial treatment consists of rest, non-steroidal anti-inflammatory agents, physiotherapy and rehabilitation. Secondary treatment measures consist of corticosteroid injection in the bursa, shockwave therapy and more recently, platelet-rich plasma (PRP) injections. When these conservative treatments fail, various surgical treatments are possible [8,9].

Open or endoscopic repair of full thickness tears seems to be the rule; the goal is to restore the distal attachment of the gluteal tendons and to promote tendon–bone healing [10,11]. For cases of gluteal tendinopathy with partial thickness tears (PTGT), a repair-based treatment requires incision of the gluteal muscles, which would aggravate the pre-existing lesion. Some authors have proposed endoscopic debridement for PTGT [12], but no study has specifically evaluated the clinical outcomes of this type of PTGT treatment.

We hypothesized that endoscopic treatment without tendon repair will provide short-term pain relief in patients with GTPS due to PTGT. The objectives of this retrospective study were to determine whether:

...
• reduction of pain;
• functional improvement;
• and patient satisfaction (on scale of 0 to 10) were obtained.

2. Material and methods

2.1. Patients

The diagnosis of GTPS related to PTGT was made based on a body of evidence:

• clinical findings: lateral peritrochanteric pain, positive Lequesne sign (pain during resisted external derotation with the hip flexed 90°);
• diagnostic testing: partial or complete reduction of pain after ultrasound-guided corticosteroid injection of the bursa;
• imaging (ultrasonography or MRI) findings: peritrochanteric bursitis, tendinopathy of gluteus medius and/or minimus (Fig. 1).

Radiographs were used to look for trochanteric calcification of the gluteal enthesis and to rule out intra-articular pathology.

All of the included patients were refractory to least 6 months of conservative treatment that consisted of physiotherapy, multiple bursal injections (corticosteroids and/or PRP) and shockwave therapy. We included 17 patients (16 women, 1 man) presenting with GTPS related to PTGT who were treated surgically by endoscopic debridement and had at least 1 year of follow-up.

This was a retrospective continuous study of patients operated between January 2010 and January 2014 at the Médiopole-Garonne clinic in Toulouse, France. All the surgical procedures were carried out by the same surgeon (O.M.). This study was approved by the clinic’s Institutional Review Board.

The mean age at the time of the procedure was 53.5 ± 13.8 years (17–71). The average duration of preoperative symptoms was 2.9 ± 1.8 years (0.5–9). The average follow-up was 37.6 ± 10.4 months (20–62).

2.2. Surgical technique

All patients were treated using the same surgical technique. They were placed in lateral decubitus on the side opposite to the injured side. Pubic and sacral posts were used to stabilize the pelvis. The leg on the operated side was held by two pads so as to place the hip in 20° abduction and release the iliotibial band. The hip was internally rotated slightly to unroll the greater trochanter. The entire leg was draped so that it could be moved as needed during the procedure.

The scope was placed in the middle anterior portal typically used for hip arthroscopy. Subcutaneous dissection was performed carefully to spare the sensory branches of the lateral cutaneous nerve of the thigh. A trocar was introduced in a posterior direction towards the space between the iliotibial band and the greater trochanter. Sweeping movements were used to palpate the contours of the greater trochanter. A 70° scope was aimed distally to locate the vastus ridge of the vastus lateralis and the trochanteric bursa. An accessory lateral instrument portal was made distal to the tip of the greater trochanter, after being located with a needle over the quadrate tubercle of the vastus lateralis.

The appearance of the bursa was evaluated (Fig. 2), and then it was resected using a radiofrequency probe and shaver. The gluteal medius and minimus muscles were evaluated after the proximal bursectomy. A probe was used to confirm that the enthesis

![Fig. 1](image1.png)  
Fig. 1. MRI of pelvis confirming greater trochanter pain syndrome: pretrochanteric bursitis (A) with gluteal muscle tendinopathy (B).

![Fig. 2](image2.png)  
Fig. 2. Endoscopic view of inflammatory pretrochanteric bursitis. (GT: greater trochanter).
was not completely torn. Treatment of the PTGT consisted of carding along the direction of the abductor fibres using a scalpel and making microperforations in the enthesis with a 1/18 K-wire (Figs. 3 and 4). These procedures were carried out through an anterolateral pretrochanteric approach; the greater trochanter was rotated as needed to complete the procedure from front to back.

A calcification was removed in two patients with calcifying tendinopathy. In the three patients with hip snapping, a diamond-shaped endoscopic decompression of the iliobial band was performed using the technique described by Ilizaliturri and Camacho-Galindo [13] (Fig. 5).

The incisions were closed with interrupted sutures. Dry dressings were used to cover the surgical wounds. The patients were discharged from the clinic on the day after the procedure.

The patients were required to use two crutches for 6 weeks to unload the hip joint. Only touch-down weight bearing was allowed. Rehabilitation started after the unloading phase was over; it consisted of physiotherapy, transverse deep fibre massage, active-passive mobilization of the hip and stretching of the abductor mechanism.

2.3. Methods used to evaluate outcomes

The clinical evaluation was performed preoperatively by the surgeon (O.M.) and during a follow-up visit by a physician not involved in the surgery (R.C.). The Harris Hip score was calculated and specific tests performed: Lequesne movement, pain during resisted abduction, single-leg standing and Trendelenburg gait. Standing on a single-leg was graded as follows:

- no difficulty: possible and pain-free > 30 seconds;
- slight difficulty: possible but painful within 30 seconds;
- major difficulty: possible but cannot be held 30 seconds;
- impossible.

Pain was assessed using a visual analogue scale (VAS) with 0 corresponding to no pain and 10 to the worst imaginable pain. Satisfaction with the outcome of the surgical procedure was evaluated using a VAS where 0 was very dissatisfied and 10 completely satisfied, and by using Odom’s criteria (poor, satisfactory, good or excellent result) [14]. The UCLA activity score was determined. Any postoperative complications or recurrence of pain and snapping were documented.

2.4. Statistical analysis

A descriptive analysis of the study population was carried out. Average values with standard deviation and range values were calculated. The quantitative variables (HHS and VAS) were not normally distributed according to the Shapiro–Wilks test, and thereby were compared using a Wilcoxon test for paired data (preoperative and at review). The significance threshold was set a 5% for all tests.

3. Results

Detailed clinical results are provided in Table 1. The VAS for pain decreased from 7.2 ± 1.1 (5–9) preoperatively to 3.3 ± 1.9 (1–7) at the review (P < 0.001). Nighttime pain was completely gone in 13 of the 17 patients (76.5%). Significant reduction in pain occurred an average of 6.4 ± 2.9 months (1–12) after the surgery.

The UCLA activity score at the longest follow-up showed that 9 patients (45%) resumed sports participation (occasional intense sports, active sports or non-intense sports).

The Harris hip score improved from 53.5 ± 8.4 (36–68) preoperatively to 79.8 ± 14.7 (45–96) at the review (P < 0.001). The Lequesne sign was negative in 10 of 17 patients (58.8%) at the latest review. No major complications were found. Three patients (17.6%) reported having occasional pain at one of the incisions. Among
the three patients who initially reported lateral hip snapping, one experienced recurrence after 26 months. This patient had a poor clinical and functional outcome, but did not want another surgical procedure.

The VAS for satisfaction was 6.2 ± 2.4 (0–9) at the last follow-up. None of the patients were very satisfied, 11 were satisfied, 4 were disappointed and 2 were dissatisfied. The degree of patient satisfaction with the surgical procedure according to Odom’s criteria [14] is given in Table 2.

4. Discussion

This study retrospectively evaluated the clinical outcomes of 17 patients with GTPS due to gluteal tendinopathy who were treated by endoscopic debridement without tendon repair. Our hypothesis that endoscopic treatment without repair improves the pain and functional scores was confirmed. However, at the last follow-up, the satisfaction with this procedure was not as high as we expected. To our knowledge, this is only study to report clinical outcomes from a homogeneous series of patients suffering from gluteal tendinopathy without tendon rupture, for which the lesions were not completed or repaired, only debrided endoscopically. These results are comparable to published results [12,15] in which the same endoscopic surgical technique was used in a non-homogeneous population of patients presenting with GTPS due to various causes.

The current study has several limitations. Its power is low because it was a retrospective study without a control group. Since

### Table 1
Clinical outcomes in the preoperative phase and at the longest follow-up (mean ± SD).

<table>
<thead>
<tr>
<th></th>
<th>Preoperative</th>
<th>At follow-up</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain (VAS)</td>
<td>7.2 ± 1.1</td>
<td>3.3 ± 1.9</td>
<td></td>
</tr>
<tr>
<td>Pain at night</td>
<td>16 cases (94.2%)</td>
<td>3 cases (17.7%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Cannot lie on side</td>
<td>17 cases (100%)</td>
<td>10 cases (58.8%)</td>
<td></td>
</tr>
<tr>
<td>UCLA activity score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occasional intense sports</td>
<td></td>
<td>2 cases (11.8%)</td>
<td></td>
</tr>
<tr>
<td>Active sports</td>
<td></td>
<td>1 cases (5.9%)</td>
<td></td>
</tr>
<tr>
<td>Non-intensive sports</td>
<td></td>
<td>4 cases (23.5%)</td>
<td></td>
</tr>
<tr>
<td>Typical moderate activities</td>
<td></td>
<td>8 cases (47.1%)</td>
<td></td>
</tr>
<tr>
<td>Occasional moderate activities</td>
<td></td>
<td>2 cases (11.8%)</td>
<td></td>
</tr>
<tr>
<td>Function</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HHS</td>
<td>53.5 ± 8.4</td>
<td>79.8 ± 14.7</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Positive Leloesne sign</td>
<td>17 cases (100%)</td>
<td>7 cases (41.2%)</td>
<td></td>
</tr>
<tr>
<td>Pain during resisted abduction</td>
<td>17 cases (100%)</td>
<td>6 cases (35.3%)</td>
<td></td>
</tr>
<tr>
<td>Positive Trendelenburg gait</td>
<td>5 cases (29.4%)</td>
<td>3 cases (17.6%)</td>
<td></td>
</tr>
<tr>
<td>Single-leg standing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No difficulty</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slight difficulty</td>
<td>8 cases (47.1%)</td>
<td>6 cases (35.3%)</td>
<td></td>
</tr>
<tr>
<td>Major difficulty</td>
<td>8 cases (47.1%)</td>
<td>4 cases (23.5%)</td>
<td></td>
</tr>
<tr>
<td>Impossible</td>
<td>1 cases (5.8%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfaction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfaction VAS</td>
<td></td>
<td>6.2 ± 2.4</td>
<td></td>
</tr>
</tbody>
</table>

Odom criteria (Table 2)

### Table 2
Satisfaction criteria according to Odom et al. [14].

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Since the procedure, would you say that</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>All the preoperative symptoms have disappeared; abnormal clinical findings have normalized</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Good</td>
<td>The preoperative symptoms persist somewhat; abnormal clinical findings are unchanged or improved</td>
<td>9 (52.9)</td>
</tr>
<tr>
<td>Satisfactory</td>
<td>Some of the symptoms have resolved; other symptoms are unchanged or partially improved</td>
<td>3 (17.7)</td>
</tr>
<tr>
<td>Mediocre</td>
<td>Symptoms and abnormal clinical findings have not changed or have gotten worse</td>
<td>5 (29.4)</td>
</tr>
</tbody>
</table>

### Table 3
Clinical results from published studies in which various surgical treatments were used to address gluteal tendinopathy.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Study</th>
<th>n</th>
<th>VAS Preoperative</th>
<th>HHS Preoperative</th>
<th>Satisfaction %</th>
<th>VAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>No repair</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open</td>
<td>Slawski and Howard [22]</td>
<td>4</td>
<td>7.2</td>
<td>51.7</td>
<td>95 (100)</td>
<td></td>
</tr>
<tr>
<td>Endoscopy</td>
<td>Wiese et al. [15]</td>
<td>37</td>
<td>7.2</td>
<td>51.7</td>
<td>95 (100)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Our study</td>
<td>17</td>
<td>7.2</td>
<td>51.7</td>
<td>95 (100)</td>
<td></td>
</tr>
<tr>
<td>+ FL tenotomy</td>
<td>Baker et al. [12]</td>
<td>25</td>
<td>7.2</td>
<td>51.7</td>
<td>95 (100)</td>
<td></td>
</tr>
<tr>
<td>Repair</td>
<td>Davies et al. [16]</td>
<td>18</td>
<td>7.2</td>
<td>51.7</td>
<td>95 (100)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Makridis et al. [17]</td>
<td>67</td>
<td>8.7</td>
<td>51.7</td>
<td>95 (100)</td>
<td></td>
</tr>
<tr>
<td>Endoscopy</td>
<td>McCormick et al. [18]</td>
<td>11</td>
<td>8.7</td>
<td>51.7</td>
<td>95 (100)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Voos et al. [19]</td>
<td>10</td>
<td>8.7</td>
<td>51.7</td>
<td>95 (100)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Thaunat et al. [20]</td>
<td>4</td>
<td>8.7</td>
<td>51.7</td>
<td>95 (100)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chandrasekaran et al. [21]</td>
<td>34</td>
<td>6.6</td>
<td>51.7</td>
<td>95 (100)</td>
<td></td>
</tr>
</tbody>
</table>

VAS: visual analogue scale.
MRI was not performed at the review, it was impossible to conclude if the tendons had healed despite not being directly repaired. In addition, since preoperative MRI findings were not available in all cases at follow-up, we could not determine the impact of gluteal atrophy on the functional outcomes.

More recently, some teams have proposed completing the gluteal tear and repairing it during an open [16,17] or endoscopic procedure [18–21]. The clinical outcomes reported in those studies appear superior to conservative treatment in the medium term. In addition, despite a low rate of repeat tears, MRI confirmed healing of the tears after double-row repair, which can explain the high satisfaction level with the procedure. Table 3 shows the clinical outcomes of the main studies in which gluteal tendinopathy cases were treated surgically [12,15–22].

5. Conclusion

Despite an improvement in the pain and functional scores in the medium term, endoscopic debridement without tendon repair provides only modest clinical results in patients suffering from gluteal tendinopathy who have failed conservative treatment.

Disclosure of interest

Rémyn Coulomb and Pascal Kouyoumdjian declare that they have no competing interest. Jérôme Essig and Gérard Ascencio declare that they have no competing interest, but are consultants for Stryker. Olivier Mares declare that he has no competing interest, but is a consultant for Newclip and Stryker. Olivier May is a consultant for Smith & Nephew in the context of this study and is also a consultant for Adler.

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