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# Endoscopic fascia lata release for treatment of gluteal tendinopathy: a prospective study with a follow-up of 6 months to 1 year

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**Greater trochanteric pain syndrome (GTPS) is clinically defined as greater trochanter pain with mechanical characteristics. The most common diagnosis is gluteal tendinopathy. Most cases of gluteal tendinopathy resolve with conservative management. In case of refractory pain endoscopic surgical treatment can resolved symptoms. This article presents a prospective study of endoscopic proximal fascia lata release associated to trochanteric bursectomy for recalcitrant trochanteric pain syndrome.**

**33 patients (35 hips) with refractory pain during more than six months were included. All patients were treated by endoscopic iliotibial band release and bursectomy according to Ilizaliturri. Outcomes were assessed by using Harris hip score and Womac hip score. Patients were follow-up until one year after surgery.**

**The mean age was 53.7 years old, there was 9 men and 24 women. There were two bilateral cases in the female group. The average duration of conservative treatment was 20 months (CI95 9 to 31 months). 68% of patients were satisfied of the surgery with disappearance of pain after surgery. WOMAC and Harris hip score significantly improved after surgery until 6 months (respectively from 67 to 29 and from 40 to 76 - $p<0.05$). No complication was reported. Age, body mass index and duration of conservative treatment did not influence surgical results.**

**This study showed that the endoscopic ilio tibial band (ITB) release and trochanteric bursectomy is simple, safe and easily reproductible but future prospective studies with a larger number of patients are required.**

**Keywords:** hip endoscopy; greater trochanteric pain syndrome; trochanteric bursitis.

## INTRODUCTION

Greater trochanteric pain syndrome (GTPS) is characterized by a lateralized chronic hip pain, exacerbated by direct palpation, active abduction, passive motion and monopodial support *(1)*. It mainly involves women between 40 and 50 years old. GTPS might be explained by multiple causes, including most frequently gluteal medius and minimus tendinopathy often associated to trochanteric bursitis, tendon tears and snapping hip. The iliotibial band (ITB) is often implicated as the source of trochanteric bursitis and tendinopathy *(2, 3, 4)*. In fact, it acts like a wire allowing to withstand the mechanical tensile stresses on the concave

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edge of the femur when walking and in asymmetric standing. Therefore, repetitive microtrauma due to friction between the greater trochanter and ITB during hip motion can result in inflammation of the interposed bursa and underlying tendons *(5)*.

This anatomical area (greater trochanter, medius and minimus gluteal tendons and ITB) has often been compared to the shoulder rotator cuff. Just as the functional anatomy is comparable, the pathology (trochanteric bursitis and tendinitis) of this region is comparable: tendinitis and bursitis due to conflict with ITB seems to be comparable to shoulder impingement syndrome *(6, 7, 8)*.

Like shoulder impingement syndrome, first-line treatment involves nonsurgical modalities including pain-relief with anti-inflammatory medication, weight reduction, activity modification, physiotherapy, shockwave therapy, local corticoid injection or platelet rich plasma (PRP) injection *(9)*. Most cases resolve with conservative treatment, with success rates described in English literature over 90% *(9)*. In few cases symptoms persist despite treatment and time. These cases may require surgical intervention. Since 2002, endoscopic ITB release and trochanteric bursectomy have been well described in the literature, quite comparable to acromioplasty and shoulder bursectomy: same pathology, same treatment *(3, 10)*. Despite a high number of articles describing the technique, there are a small number of studies, with often a few numbers of patients, reporting the results of this treatment.

The aim of our work was to define the clinical outcome of patients undergoing endoscopic iliotibial band release in the management of gluteal medius and minimus tendinopathy associated or not to trochanteric bursitis and the duration of pain resolution after surgery.

Our hypothesis was that the endoscopic technique would achieve satisfactory results in patients with gluteal tendinopathy that do not respond to conservative measures after six months.

## MATERIALS AND METHODS

All patients were fully informed of our intention to publish and signed an informed consent. All data were anonymized to protect patients. The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article. The authors received no financial support for the research, authorship, and/or publication of this article. Ethics approvals were granted by the Ethics Committees of our institution (Reference: P2020/003).

From September 2013 to March 2019, 55 cases of endoscopic bursectomy and ITB release at EpiCURA Hospital were included. To be eligible, patients had to be at least 18 years old, and have gluteal tendinopathy for at least six months, with failure of conservative management and correction of risk factors when possible (leg length discrepancy, obesity). Conservative treatment included a combination of physiotherapy, rest and NSAIDs, and corticoid injection. Patients were excluded from the study if they had previous hip surgery. Patients with hip arthritis with a Tönnis grade greater than two were excluded. Indeed, in presence of advanced hip arthritis, GTPS was considered as a consequence of arthritis and treated in consequence. Patients with major hip dysplasia (subluxation and loss of sphericity of the femoral head) were also excluded from the study.

Outcome measures included the modified Harris Hip Score (mHHS), the Western and Ontario Mc Master Universities Arthritis Index (WOMAC) score and a simple question to the patient: are you satisfied or not? Age, body mass index (BMI) and duration of conservative management were also collected. Pre, and post-operative data were collected from the patient's visit to their orthopedic surgeon before surgery and at 15 days, 6 weeks, 3 months, 6 months and 1 year.

For the study, diagnosis of gluteal tendinopathy, associated or not to bursitis, was established both on clinical examination and imagery exploration (ultrasound and/or Magnetic Resonance Imaging (MRI)). Each patient with a clinical presentation (GTPS) compatible with gluteal tendinopathy and a non-responsive medical treatment during more than six months was investigated by imagery exploration. First, ultrasound examination was performed. Typical signs of tendinopathy and bursitis were researched to support the diagnosis of gluteal tendinopathy: thickened and heterogeneous

aspect of tendons, with a loss of the normal fibrillar pattern. Bursitis can easily be described. Calcifications are also commonly seen within the gluteus medius and gluteus minimus tendons *(1)*. In case of doubt (tendon tears, atypical ultrasound appearance), or normality of the ultrasound, MRI was performed.

Two different senior surgeons (RM and AC) performed the surgery. The technique described by Ilizaliturri was used *(11)*. Under general anesthesia, patients were installed in dorsal decubitus, with no traction. Two incisions were performed 3 cm above and 3 cm below the tip of the GT to allow the introduction of a 30° scope and a VAPR (Smith & Nephew – London, United Kingdom), above the ITB. Saline was instilled to allow tissue distraction. Anteroposterior fluoroscopy was used to assess correct positioning of VAPR before performing ITB release (Fig. 1). The ITB was released with a cross-shaped section after clear identification (Fig. 2). Elliptical resection was made by resection of the four corners of the cross (Fig. 3 and Fig. 4) above the ITB. After release of the ITB, a trochanteric bursectomy was always performed. Indeed, bursectomy is the historical treatment of GTPS, ITB release would have been introduced later to prevent recurrence *(2)*. A systematic exploration of the gluteal tendon by palpation was also made. Before removing the instruments, rigorous hemostasis is performed with VAPR to prevent possible postoperative hematomas. Each skin incision was closed by a stitch of ethilon

***Figure 1.*** — Intraoperative photograph of a patient positioned for a left hip arthroscopy for fascia lata release.

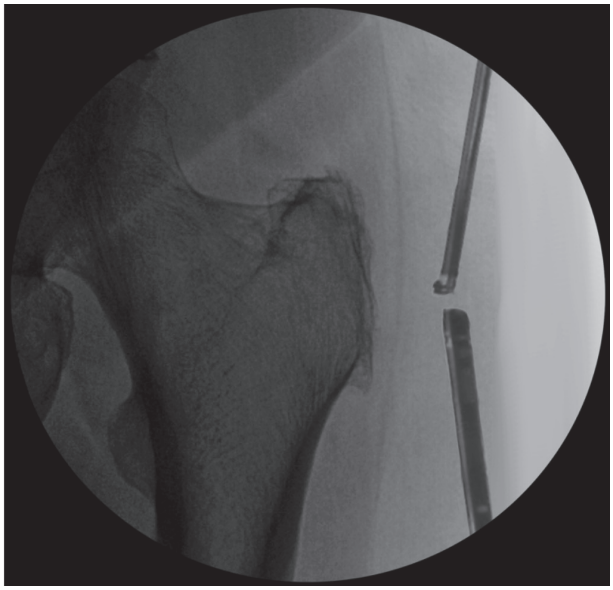


***Figure 2.*** — Fluoroscopy view to assess correct positioning of instruments.

(Ethicon - Somerville, New Jersey, United States). All the patients benefited from a compression dressing on the lateral aspect of the hip during twelve hours to avoid hematomas. Operating time averaged 30 minutes as described in the literature *(12)*. All patients followed the same post-operative protocol: full-weight bearing with two crutches, physiotherapy including passive mobilization and reinforcement exercises and painkillers. Low

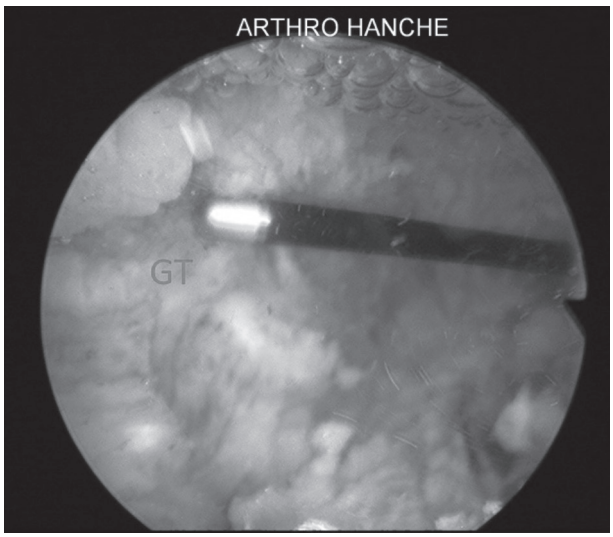



***Figure 3.*** — Cross-shaped section of ITB (GT: greater trochanter)..

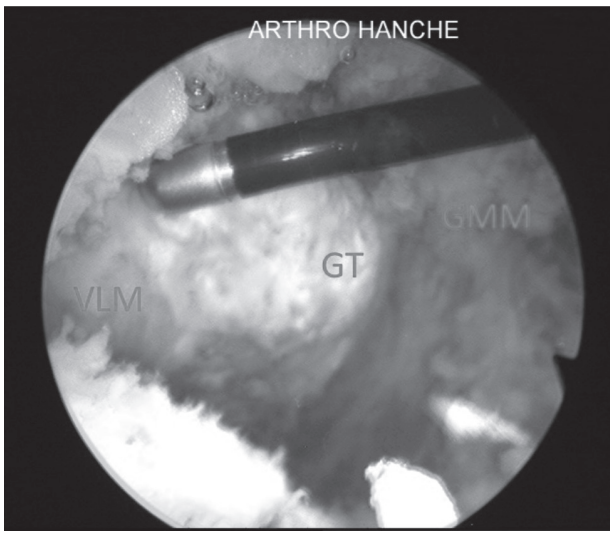



***Figure 4.*** — Elliptical resection of ITB in front of greater trochanter (GT) (VLM: vastus lateralis muscle; GMM: gluteus medius muscle).

molecular weight heparins, enoxaparin 40mg per day, were administered for the first 10 post-operative days. The first injection was performed 6 hours after the end of the surgery. The patients stayed one night at the hospital before returning home.

Statistical analyses were accomplished using Xlstat® software (Addinsoft, Paris, France). According to the type of data, the independent t-test (quantitative variables), chi-squared test, and Mann-Whitney U test (categoric variables) were performed. The results were regarded as significant if p was $< 0.05$.

## RESULTS

35 hips (33 patients) were included in the study. As mentioned in Figure 5, 20 cases were not included in this prospective study. Indeed, 5 patients were lost of follow-up before 6 months. 15 patients did not complete the follow-up forms and asked to leave the study, judging the forms too restrictive to complete. Among the 35 hips, 9 belonged to men and 26 to women. There was two bilateral cases in the women's group. Mean age was 53.7 years old (CI95 49.6 – 57.7). The average duration of conservative treatment was 20 months (CI95 9 – 31 months). For all the 35 hips, follow-up was available until 6 months. Due to lack of completed follow-up forms after 6 months for 12 patients, only 23 patients from the 35, had a follow-up time of one year. Then, at 6 months, we had 35 hips and only 23 at one year. Preoperatively, the mean mHSS was 40 points (CI95 36 – 46) and the mean WOMAC score was 67 points (CI95 61 – 74).

Both the WOMAC and mHHS scores demonstrated better results at each visit compares

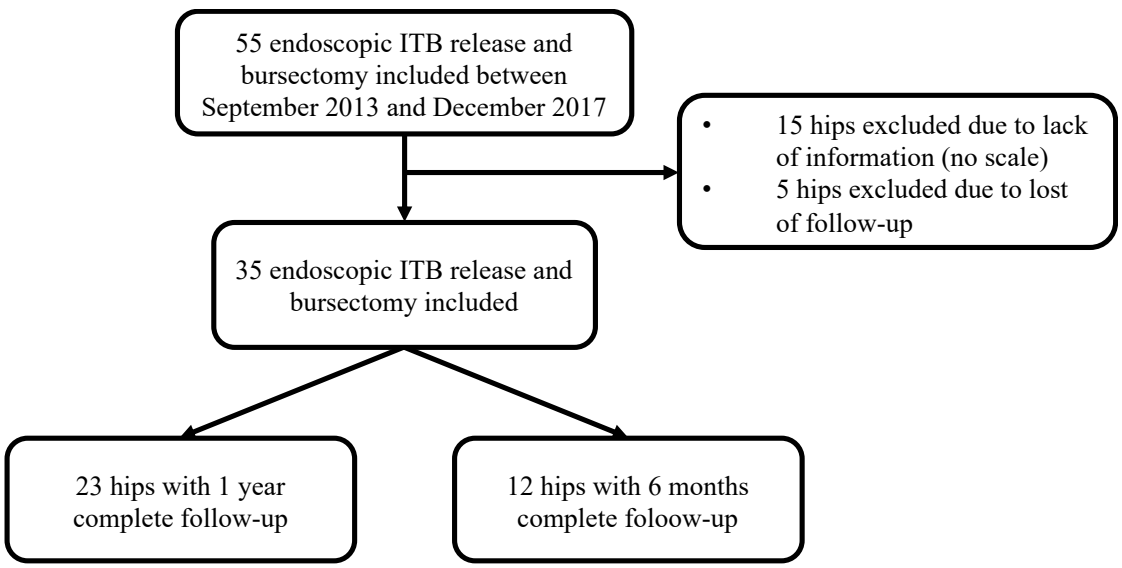
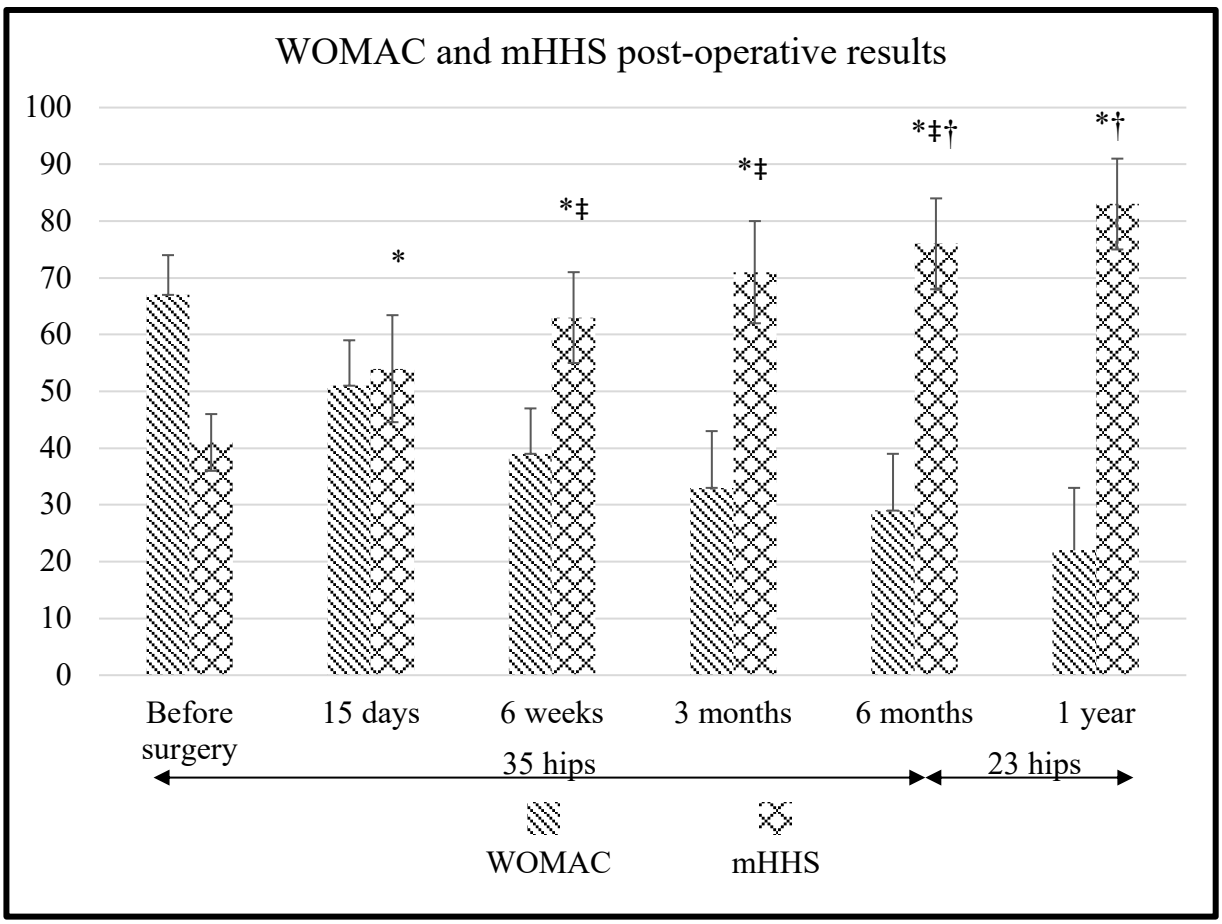



***Figure 5.*** — Chart flow of the study.

with pre-operative results. The WOMAC went from 67 to 22 (IC95 11 – 34) at one year and the mHHS from 40 to 85 (IC95 77 – 93) ($p<0.05$). While the WOMAC and the mHHS were statistically different between pre-operative time, 15 days, 6 weeks, 3 months and 6 months ($p<0.05$), there was no differences for these scores between 6 months and 1 year ($p>0.05$) (Fig. 7). Then the maximum score for both WOMAC and mHHS was reached at 6 months with respectively 29 and 76 (Fig. 6).

For each following variable (age, duration of conservative treatment and BMI), population was dividing into two groups and compare (univariate analysis) depending of the median of each variable. Then, to measure impact of age on post-operative results, we compare post-operative scores between patients younger than 56 years old and patient age of 56 years old and more. No difference was observed in post-operative scores between young and old patients at any time before and after surgery ($p>0.05$). The same manipulation was performed with BMI (median 29kg/m2) and duration of conservative treatment (median 11 months). There was no difference in post-operative scores results between patients with a BMI <29kg/m2 and patient with a BMI ≥29kg/m2 ($p>0.05$). Same results were obtained between patients with a conservative treatment <11 months and patients with a conservative treatment ≥11 months.

Among the 35 hips, 24 hips in 24 patients (68%) were satisfied and 11 hips, 10 patients were not satisfied (including one case of fibromyalgia,




* WOMAC and mHHS were statistically different from the pre-operative period with $p<0.05$ at 15 days, 6 weeks, 3 months, 6 months and 1 year; ‡ WOMAC and mHHS were statistically increase at 6 weeks compare to 15 days, at 3 months compare to 6 weeks and at 6 months compare to 3 months; † There was no difference for WOMAC and mHHS between 6 months and 1 year.

***Figure 6.*** — Diagram of clinical scores between and after surgery.

| WOMAC | | | | | | |
|---|---|---|---|---|---|---|
| | Pré -op | J15 | 6S | 3m | 6m | 1a |
| Pré -op | - | 0,0001 | 0,0001 | 0,0001 | 0,0001 | 0,0001 |
| J15 | | - | 0,0010 | 0,0001 | 0,0001 | 0,0001 |
| 6S | | | - | 0,0100 | 0,0030 | 0,0040 |
| 3m | | | | - | 0,0320 | 0,1000 |
| 6m | | | | | - | 0,4000 |
| 1a | | | | | | - |

| mHHS | | | | | | |
|---|---|---|---|---|---|---|
| | Pré -op | J15 | 6S | 3m | 6m | 1a |
| Pré -op | - | 0,0040 | 0,0001 | 0,0001 | 0,0001 | 0,0001 |
| J15 | | - | 0,001 | 0,0001 | 0,0001 | 0,0001 |
| 6S | | | - | 0,0001 | 0,0001 | 0,0001 |
| 3m | | | | - | 0,001 | 0,0001 |
| 6m | | | | | - | 0,0700 |
| 1a | | | | | | - |

***Figure 7.*** — Results of cross t-student between each dead-line follow-up.

one case of gluteus medius tear and two cases of persistent trochanteric bursitis). The two persistent trochanteric bursitis had to undergo re intervention with realization of arthroscopic procedure and the gluteus medius tear underwent surgical repair. No portal complications, no infection and no sciatic nerve lesion were observed.

## DISCUSSION

Initially, open surgery of ITB release and bursectomy were described with good results. Since 2002, endoscopically treatments (in a similar way to slide from open shoulder surgery to arthroscopy *(13)*) have been developed. Our study suggests 68% of satisfied patients, with 45 points (on 100 points) improvement of the WOMAC and mHHS scores, reached at 6 months after surgery. Including our study, 123 patients in 7 studies have been treated by endoscopic bursectomy and/or ITB release, with 104 (84% range 72 – 100) patients satisfied of their surgery (Table I) *(10, 14, 15, 16, 17, 18)*. Fox et al. *(10)*, in 2002, was the first to perform an arthroscopic bursectomy with ITB release in 27 patients. 23 patients had good results. Baker et al. *(15)*, in 2007, was the first to perform a prospective study of endoscopic bursectomy and ITB release in 25 patients (25 hips) with a mean follow-up of 26.1 months. 72% (18 patients) of patients were totally relieved of their pre-operative pains.

This satisfaction is linked to an improvement in the evaluation scores, whatever they may be. Indeed, our study demonstrated a significative improvement of the WOMAC and the mHHS scores. Improvement in pain score (Visual Analog Scale), in sports score (Hip Outcome Score) and in ADL score (Hip Outcome Score) have also been observed. These improvements are often important, representing 50% of the amplitudes of the different scores *(15, 16, 19)*.

Complication rate of this procedure is very low (3%) with only minor complications reported. On 124 patients operated, only one seroma, one neuroma and superficial hematomas have been described (Table I). However, the whole re intervention rate is

Table I. — Review of the results of endoscopic ITB release and bursectomy. For Maes et al. study, only the 23 patients with one-year follow-up were included.

| Authors | Year | Prospectif/ retrospectif | Surgery | Number of patients treated | Improvement score | Percentage of satisfactory | Complications | Re-operation for persistent pain |
|---|---|---|---|---|---|---|---|---|
| Fox et al. | 2002 | Retrospective | Endoscopic bursectomy and ITB release | 27 | - | 85% (23 patients) | 0 | - |
| Baker et al. | 2007 | Prospective | Endoscopic bursectomy and ITB release | 25 | 26 points (mHHS) | 72% (18 patients) | 1 seroma | 1 open revision |
| Farr et al. | 2007 | Retrospective | Endoscopic bursectomy and ITB release | 2 | - | 100% (2 patients) | 0 | 0 |
| Van Hofwegen et al. | 2013 | Retrospective | Endoscopic bursectomy | 12 | 6 points VAS | 83% (10 patients) | - | - |
| Dominguez et al. | 2015 | Retrospective | Endoscopic bursectomy and ITB release | 23 | 46 points (mHHS ); 75 points HOS sport and 45 points HOS ADL | 91% (21 patients) | 1 neuroma and superficial hematomas | 0 |
| Thomassen | 2019 | Retrospective | Endoscopic bursectomy and ITB release | 11 | - | 91% (10 patients) | - | 1 endoscopic revision |
| Maes et al. | 2020 | Prospective | Endoscopic bursectomy and ITB release | 23 | 50 points (mHHS and WOMAC) | 83% (20 patients) | 0 | 2 endoscopic revision |
| TOTAL | | | | 123 | - | 84% (104 patients) | 1.8% (2 patients) | 3.2% (4 patients) |

higher with 5.6% *(20)*. The most important cause of re intervention is persistent pain (3.2% of patients), effectively treated by open or endoscopic revision *(14, 15)*.

Concerning our patient with gluteus medius tear, he only had ultrasound before surgery without mention of a gluteal tear. A post-operative MRI was performed due to persistent pain demonstrating a partial thickness tear of gluteus medius tendon. No gluteal tear has been reported as a complication of bursectomy and ITB release in the literature. It is difficult to determine if this tear was present before surgery and misdiagnose by ultrasound and surgery exploration or if it is a direct complication of the procedure. Most of the full thickness tears can be diagnosed during surgery. However partial undersurface tears are more difficult to demonstrate during endoscopic exploration, with risk of misdiagnosis the lesions *(21, 22)*. Anyway, Coulomb et al. in 2016 demonstrated that isolated bursectomy and ITB release in presence of tendons tears allow modest clinical results *(23)*. Then, gluteus tears must be eliminated before surgery by systematically performing an MRI, especially to eliminate an undersurface or a partial thickness tear.

Other surgical techniques have been described like ITB Z-lengthening, distal fascia lata lengthening and trochanteric reduction osteotomy *(14, 24, 25, 26)*. There is at the moment no consensus for the best surgical technique (open or endoscopic treatment,

bursectomy alone or associated with ITB release or lengthening, trochanteric reduction). Indeed, most of the reports had a low number of patients, presented heterogenicity in inclusion criteria, concern different pathologies (bursitis, snapping hip, gluteus tears) and are retrospective *(3, 19, 20, 26)*.

The advantages of this endoscopic approach are the limited soft tissue disruption and diminished blood loss that lead to a decrease of morbidity compared with open procedures *(26)*. However, clinical results compared to open surgery are similar, with same rates of satisfactory and same score improvements. Indeed, three studies are available for open bursectomy and ITB release reporting 100%, 100% and 80% of satisfied patients and improvements of mHHS of 50 points *(28, 29, 30)*. Here again, an analogy with subacromial impingement arthroscopically treated is striking *(13)*.

This study has some limitations. Despite the fact that gluteus tendinopathy has the highest prevalence and incidence of all lower limb tendinopathies, our number of treated hips is low like the other published studies on the subject. This is due to the fact that ITB release and bursectomy is a salvage surgery in order to suppress pain in patients not relieved by medical treatment. This is also why we did not present a control group. Indeed, all patients have already benefited from alternative treatments. This is also due to a high number of losses of follow-up patients (5 patients). If these patients are included as "unsatisfied" patients, the percentage of our satisfied patients decreases from 68% to 60%. We did not obtain the 1-year scores for 12 hips out of 35. Then only 23 hips are analyzed at one year. Therefore, our absence of significant difference between the results at 6 months and 1 year is difficult to interpret; it could be due to an absence of difference or to a lack of power linked to the decrease in the number of hips treated. Six months to one year of follow-up is a short follow-up after surgeries. However, our results demonstrated that maximum recovery is reached at 6 months. Our results are similar to those presented by Baker and Domínguez *(15, 16)*. Indeed, Baker in a study with 26 months of mean follow-up has shown that the final result was obtained after one month, whereas Domínguez demonstrated that final result was obtained between 3 and 6 months after the surgery *(15, 16)*. Longer follow-up would probably not provide additional information.

## CONCLUSION

Gluteal tendinopathy, associated or not to trochanteric bursitis, can be easily and safely treated by endoscopic bursectomy and ITB release in case of failure of conservative treatment. Future studies with a larger number of patients are however required to better evaluate the results.

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