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Technical note

Technique to treat iliopsoas irritation after total hip replacement: Thickening of articular hip capsule through an abridged direct anterior approach



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ABSTRACT

Iliopsoas irritation due to acetabular cup component impingement following total hip arthroplasty (THA) is usually treated by infiltration or by distal iliopsoas tenotomy in case of recurrence; however, this can result in an active flexion deficit of the thigh. To prevent this complication, we developed an original technique that we performed between 2012 and 2014 in patients with recurrent impingement following extraarticular corticosteroid injections. This included 5 patients (mean age: 64 [53–75] years old) in whom we performed an ambulatory bursectomy by the Hueter approach and placed a polyglactin 910 (Vicryl™) mesh plate on the entire anterior hip capsule. After a mean follow-up of 12 months (9–29 months), anterior pain had decreased in all patients with improvement and an increase in the Oxford-12 (mean: 15 points [10–19]), Merle d'Aubigné (mean: 2.5 points [1–5]) and Harris (mean: 18 points [10–29]) scores. No flexion deficits were observed. An infected postoperative hematoma had to be drained but was cured at follow-up. This simple procedure provides satisfactory results and preserves THA function. It does not jeopardize future procedures and is an alternative option in case of unsuccessful conservative treatment.

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1. Introduction

Iliopsoas irritation and retroiliac bursitis [1] have been reported in 4.3% [2,3] of painful total hip arthroplasties (THA). There are numerous etiologies:

- anterior overhang of the acetabular cup component;
- over-reaming of the anterior wall;
- an oversized cup;
- anterior sharp design of cementless component;
- cement plugs, reconstruction cages;
- lateralization and/or lengthening [4–7].

In general, the patient presents with groin pain during active hip flexion and flexion against resistance but there is no pain when walking on flat ground [2]. Functional disturbances are increased when climbing stairs, getting out of a vehicle or when the foot grip

during level walking [2,6]. The diagnosis can be confirmed by a positive extracapsular infiltration test with lidocaine [2,7].

Initial treatment usually involves image-guided time-released extraarticular corticosteroid injections [7,8]. In case of recurrence, a procedure that is adapted to the etiology and that takes into account any potential morbidity may be proposed: cup replacement, which is associated with the complications of revision THA or distal iliopsoas tenotomy (surgical [2,6] or arthroscopic [9]) including a risk of developing a flexion deficit of the thigh [2,6,10]. To avoid these complications we developed a surgical technique using an anterior extraarticular intermuscular approach that preserves the iliopsoas tendon and combines a bursectomy with anterior capsule thickening.

2. Technique

Between 2012 and 2014, we applied a protocol in a series of patients presenting with anterior pain during flexion against resistance of the thigh following THA (all THA were performed by the posterior approach, 3 primary THA with cementless cups and 2 THA with revision of the acetabular component and placement of a reconstruction cage). None of the acetabular components were

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Fig. 1. View of the surgical approach to the right hip. Passage through the sheath of the tensor fasciae latae (1) exposes the rectus femoris muscle (2). Flexion of the hip facilitates access under the iliopsoas (3) to place the retractor near the iliopubic eminence and to obtain exposure of the entire articular capsule (4) for the bursectomy.

over-reamed with a mean cup diameter of 52 mm (48–56). A CT was performed in all patients [11] to evaluate component position and exclude significant malposition (mean anteversion 29° [26–35], mean inclination 44° [36–52]). Only one patient presented with acetabular cup overhang (4 mm) that was visible on CT. Articular aspiration was performed in the operating room to rule out infection and the diagnosis was confirmed if extracapsular CT-guided infiltration of lidocaine was positive [2,8]. First line therapy was a CT-guided extraarticular injection of corticosteroids, which was repeated no more than once. In case of recurrence after the second corticosteroid injection the following procedure was performed.

The patient was installed in the supine position with a pillow under the buttocks and the entire lower limb included in the surgical field for mobilization. An anterior Hueter approach was used with ligation of the lateral circumflex artery (Fig. 1). The iliopsoas muscle was raised from the capsule and a bursectomy was performed (Fig. 1). The hip was placed in flexion to allow placement of a retractor on the iliopubic eminence (Fig. 1) and two other retractors were placed on the superior and inferior femoral neck (Fig. 2).

Anterior overhang of the cup was identified by palpation in all cases. We observed anterior capsule dehiscence in 3 cases. Four layers of a polyglactin 910 (Vicryl™, Ethnor, Auneau, France) mesh

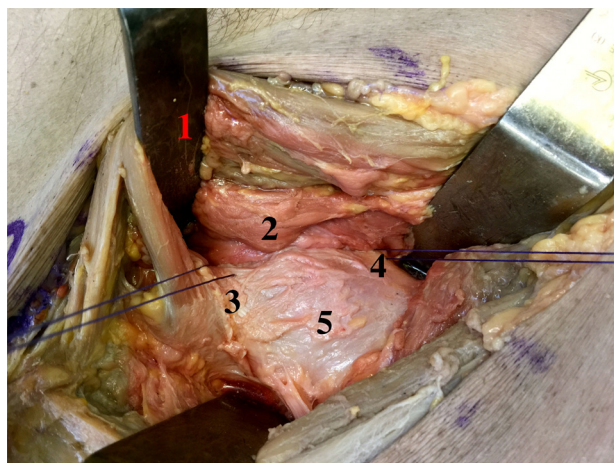


Fig. 2. View of the right hip. After exposing the capsule with a retractor (1) placed on the anterior column under the iliopsoas (2) supero-medial (3) and infero-medial (4) corner sutures are placed in the capsule (5).

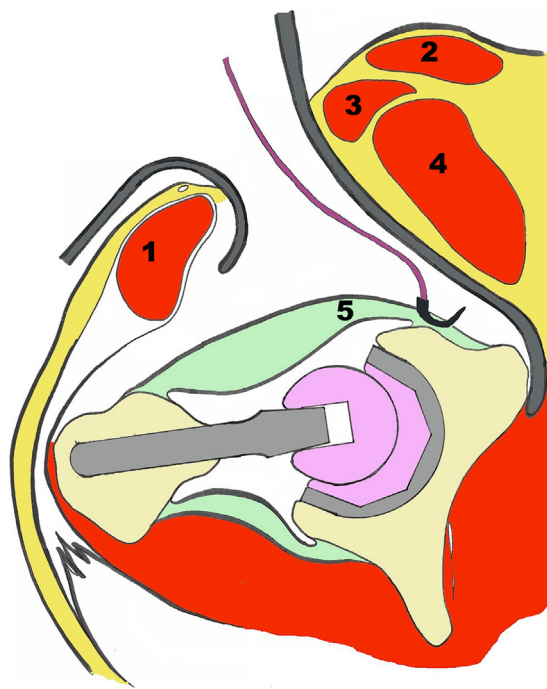


Fig. 3. Transverse schema of the technique. The intermuscular approach between (1) the tensor fasciae latae, (2) the Sartorius, (3) the rectus femoris and the (4) iliopsoas to expose (5) the most medial part of the capsule to expose using a double-angled retractor placed on the iliopubic eminence.

plate were laid on the anterior capsule and attached by 4 corner sutures with polyglactin 910 suture. First the supero- and infero-medial sutures were performed (Fig. 2) (the supero-medial could be attached to the Cooper ligament (Fig. 3)), then the polyglactin mesh was laid upon these 2 sutures (Fig. 4) which when tightened pressed the mesh onto the internal rim of the capsule (Fig. 5). The mesh plates were then applied to the anterior side of the capsule and cut to the width necessary to be attached to the base of the femoral neck along the intertrochanteric line by two lateral corner sutures (Fig. 5). The wound was closed on a suction drain for 2 to 6 hours, weight bearing was immediate, and surgery was ambulatory. No rehabilitation was necessary.

3. Results

We used this procedure in 5 patients who all presented with iliopsoas impingement symptoms that were confirmed by the diagnostic approach described above. There were 3 women and 2 men, mean age 64 years old (53–75) and mean BMI 27 (23–34). After a

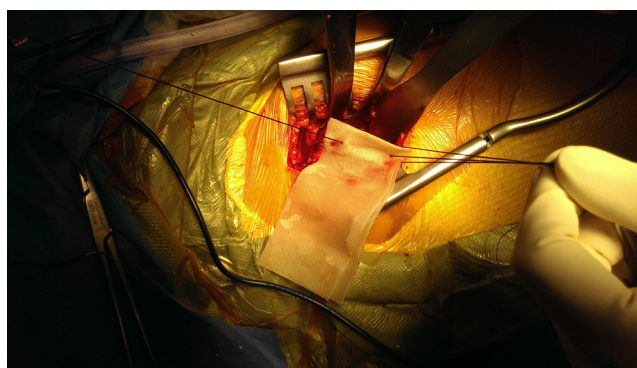


Fig. 4. View of right hip during surgery. The four layer polyglactin 910 (Vicryl™) mesh plate is laid upon the supero-medial and infero-medial sutures.

Table 1
Demographics and details of results.

	Delay between pain/THA (months)	Duration of psoas pain (months)	Follow-up (month)	Increase in Oxford (score at follow-up) [12]	Increase in PMA (PMA at follow-up) [13]	Gain in Harris score (score at follow-up) [14]	Complications	Flexion strength	Injury to the lateral cutaneous nerve of the thigh	BMI
Mr P.	12	11	10	10 (24)	2 (15)	24 (78)	Infection <i>S. Caprae</i> , lavage + antibiotics 42 days	5/5	Yes	34
Mrs D.	24	12	10	16 (14)	1 (17)	10 (98)	None	5/5	No	23
Mr S.	168	6	10	11 (21)	1 (16)	10 (84)	None	5/5	No	31
Mrs L.	6	24	9	16 (20)	3 (16)	15 (80)	None	5/5	No	23
Mrs D.	12	24	29	19 (14)	5 (17)	29 (97)	None	5/5	Yes	24

THA: total hip arthroplasty, PMA: Merle d'Aubigné Score.

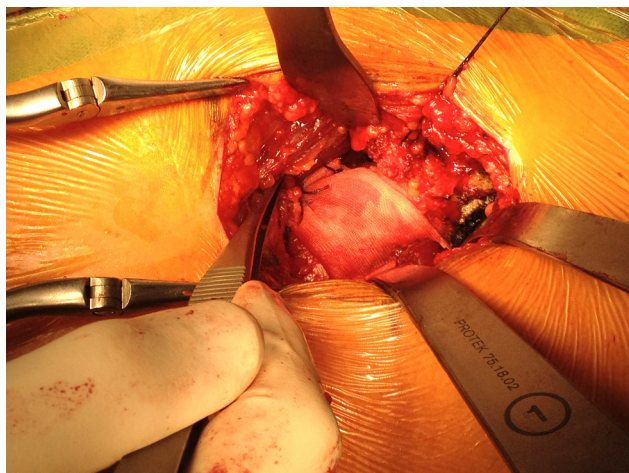


Fig. 5. Right hip during surgery. The polyglactin 910 (Vicryl™) mesh plate is attached by the 4 sutures and protects the anterior capsule.

mean follow-up of 13.6 months (9–29) anterior pain had decreased in all patients, generally within 6 weeks after surgery. There was no flexion deficit of the thigh. We observed a mean increase in the Oxford score [12] of 15 points (10–19), of 2.5 points (1–5) in the Merle d'Aubigné [13] score and of 18 points (10–29) in the Harris [14] score (Table 1). One patient presented with an infected hematoma (*S. Caprae*) treated by extraarticular surgical lavage and 6 weeks of antibiotics resulting in a clinical and biological cure at 10 months follow-up (the bacteria was only identified in one sample with suspected contamination). The decision to begin anti-infectious treatment was based on the discovery of a breast tumor in the patient requiring immediate chemotherapy. Two patients presented with sensory deficits (none had neuralgia) in the area of the lateral femoral cutaneous nerve. Only one of these patients serious impairment related, he had a former pelvic osteotomy by anterior approach with existing sequella of the lateral femoral cutaneous nerve.

4. Discussion

Iliopsoas tendinopathy is a rare complication of THA, which can have significant functional consequences [1–6]. Successful conservative medical treatment by extracapsular infiltration, which is also a diagnostic tool, is not always long-lasting [2,7]. In case of recurrence, distal iliopsoas tenotomy (surgical or arthroscopic) is often the first line treatment [2,9,10] because it is not associated with the complications associated with acetabular revision due to malposition [6]. Our technique has the advantage of preserving the iliopsoas, which can otherwise result in a temporary or permanent flexion deficit if released, although this situation is rare. [2,6,10]. Our short-term results are comparable to those of distal iliopsoas tenotomy. Besides the hematoma, which is not specific, our main complication was lateral femoral cutaneous nerve injury, which is inherent to this surgical approach [15]. This complication is

relative, because it was only reported in one patient who already had nerve injury following an osteotomy of the pelvis using the same surgical approach.

5. Conclusion

This simple technique provides satisfactory results, does not jeopardize future procedures, and prevents an active flexion deficit, which may develop following tenotomies. This is an alternative option for the treatment of acetabular cup/iliopsoas impingement that should be evaluated in larger studies with longer follow-up.

Disclosure of interest

The authors declare that they have no competing interest.

Outside of this study, H. Migaud is an educational and research consultant for Zimmer and Tornier, G. Pasquier is an educational and research consultant for Zimmer and J. Girard is an educational and research consultant for Microport, Smith and Nephew and B-Braun.

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