



# Surgical Technique: Anterior Lesser Trochanteroplasty with Psoas Repair

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## Abstract

Ischiofemoral impingement is a source of hip pain derived from impingement between the lesser trochanter and the ischium. Lesser trochanter excision has been recommended for

recalcitrant ischiofemoral impingement through either an anterior or posterior approach. However, neither of these approaches involves refixation of the iliopsoas tendon. We describe an endoscopic procedure involving anterior trochanteroplasty, minimizing the risk of sciatic complications, with refixation of the partially detached iliopsoas tendinous insertion, potentially minimizing compromise to hip flexion strength and anterior hip stability.

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## Keywords

Ischiofemoral impingement · Lesser trochanter excision · Iliopsoas tendon refixation

## Introduction

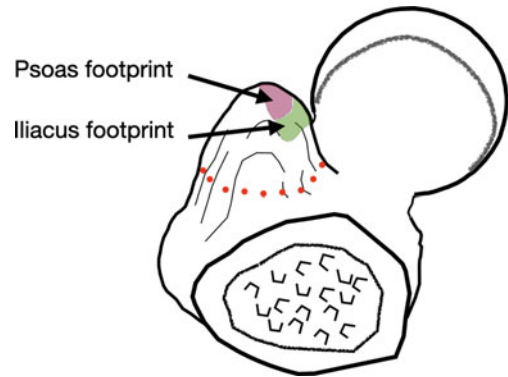
An association between hip pain and quadratus femoris muscle abnormality (e.g., edema, atrophy) on magnetic resonance imaging (MRI) with concurrent narrowing of the ischiofemoral space has been established. In this context, ischiofemoral impingement (IFI) is a source of hip pain derived from impingement between the lesser trochanter (LT) and the ischium.

The diagnosis of IFI can be made with the combination of subjective symptoms, physical examination, and radiologic imaging. Measured by MRI in healthy subjects, the average ischiofemoral distance in neutral rotation is 2.8 cm [1]. A diagnosis of IFI is determined when MRI demonstrates a narrowed ischiofemoral distance of less than 5 mm [2] and quadratus femoris edema [3].

The goal of the surgery is enlargement of the narrowed ischiofemoral space. LT excision has been recommended for recalcitrant IFI via either an anterior or posterior endoscopic approach.

From the point of view of surgical access, the endoscopic anterior procedure has been described. By necessity, the anterior approach is associated with some degree of detachment of the iliopsoas tendon (IPT) [4, 5]. The posterior endoscopic approach has the advantage of less compromise to the IPT but the disadvantage of more risk of sciatic nerve damage [6]. In any case, bone resection may be limited with attempts to preserve the insertion of the IPT.

From the point of view of anatomy, the characteristics of the IPT insertion have been described [7]. A double tendinous footprint is found in most cases and located on the antero-medial tip of the LT (Fig. 1). It seems that a lesser trochanteroplasty performed to increase the ischiofemoral space without partially or totally detaching the IPT is improbable (even with a partial lesser trochanteroplasty). The average dimensions of the IPT when inserted as a conjoined structure were reported to be  $11.6 \times 22.6$  mm with a mean area of  $211.2$  mm<sup>2</sup>. These dimensions make it possible to place at least two suture anchors in the footprint of the LT subsequent to lesser trochanteroplasty.



**Fig. 1** Posterior aspect of the left hip (view from distal). An anterior cortical area with no tendinous insertion on the distal aspect of the lesser trochanter is present. FH, femoral head; FN, femoral neck; GT, greater trochanter

Attempts to minimize detachment of the IPT by preserving the insertional region of the LT may result in residual IFI with incomplete symptomatic relief.

In this chapter, an anterior endoscopic approach is described, which is more familiar to surgeons and has less risk of sciatic complications. After lesser trochanteroplasty is performed, reattachment of the IPT is completed by means of two anchors placed in the footprint [8].

## Surgical Technique

### Patient Setup

The patient is placed in the supine position on a radiolucent surgical table. No hip traction or perineal post is required. The leg is positioned with the hip in slight external rotation to show the maximal width of the lesser trochanter in profile on anterior–posterior fluoroscopic projection with a vertically aligned C-arm. The following principal superficial landmarks are identified: Anterior Superior Iliac Spine (ASIS) and the greater trochanter (GT). The ASIS–center of the patella line and its perpendicular tangential to the tip of the GT are plotted. The operating area is prepared and draped in a standard sterile fashion. Standard length 30° arthroscope is used with arthroscopic pump pressures between 30 and 40 mm Hg.

## Portal Placement

Two portals are used: the viewing portal (VP) proximal and the working portal (WP) distal with respect to the LT. Both portals are placed 1–2 cm lateral to the line between the ASIS and the central axis of the patella (Fig. 2).

Two skin incisions are performed under fluoroscopic guidance. The first for VP and onto the proximal aspect of the lesser trochanter. The second for the WP and 3–4 cm distal with respect to the VP. Triangulation of blunt probes converge at the anterior surface of the lesser trochanter.

Tactile feedback and fluoroscopic imaging confirm correct placement. The VP blunt obturator is exchanged for a standard-length 4.0-mm 30° arthroscope. Under direct vision, the WP blunt probe is exchanged for a motorized shaver. Under direct vision of the IPT, the following four steps for lesser trochanteroplasty and IPT refixation are performed.

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## Lesser Trochanter Resection (Incomplete)

Under endoscopic visualization, a motorized shaver resects overlying bursal tissue on the anterior surface of the LT. IPT insertional fibers are identified on the anterior region of the LT. A distal-to-proximal incomplete LT osteoplasty is performed with the 5.5 mm burr in line with the medial cortical surface of the femur. Visualization of the proximal and posterior LT is facilitated by flexing, abducting, and externally rotating the hip. The incremental bone resection is performed under arthroscopic and fluoroscopic guidance. A remaining bone block is progressively formed that corresponds to the proximal LT and features a proximal and posterior pedicle (Fig. 3). This bone block contains the intact iliopsoas posterior tendinous insertion, which minimizes retraction of the detached anterior portion.

## Iliopsoas Tendon Distal Anchor Placement

Through the WP a 2.9-mm all-suture anchor preloaded with two #2 nonabsorbable sutures is seated in its drilled hole. The location for the anchor is approximately on the distal margin of the LT footprint formed via incomplete LT osteoplasty. A suture-passing device of surgeon's choice facilitates passage of both sutures through the IPT to achieve distal control of the detached anterior portion of the IPT (without tying the knots) (Fig. 4).

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## Lesser Trochanter Resection (Complete)

Complete LT bone resection is performed (Fig. 5a), enabling mobilization of the bone block with attached IPT. The threads used to reinsert the IPT on the distal footprint of the LT osteoplasty are then secured under gentle tension using standard arthroscopic knot-tying technique.

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## Iliopsoas Tendon Proximal Anchor Placement

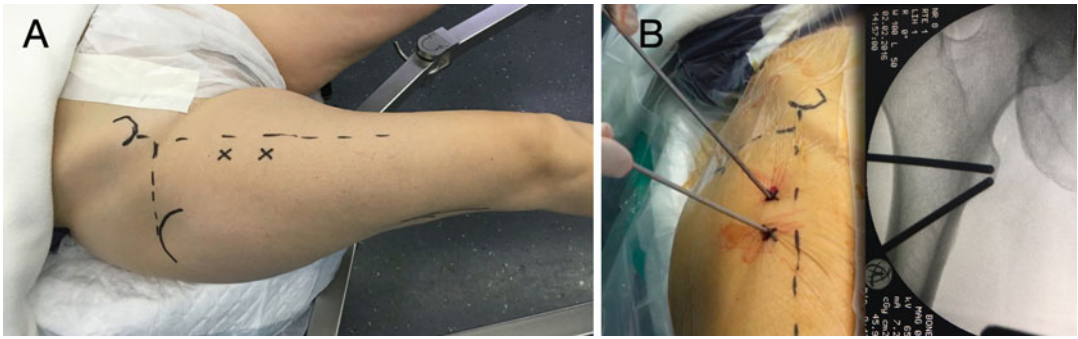
Following distal IPT refixation, a 2.9-mm all-suture anchor is placed on the proximal area of the IPT footprint (Fig. 5b). Both #2 sutures are passed through the proximal segment of the IPT with a suture-passing device in a mattress configuration. Tension is applied to all free suture limbs to fully reduce the posterior IPT to the proximal footprint followed by secure refixation using standard arthroscopic knot-tying technique (Fig. 6).

Figure 7 shows the final fluoroscopic view of a right hip after completed endoscopic resection of the LT.

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## Rehabilitation

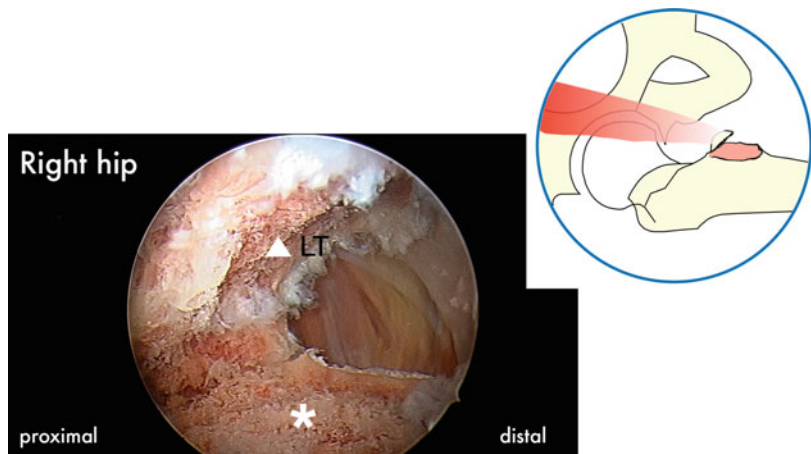
Partial weight bearing is recommended using two crutches for 4 weeks and a single crutch for the following 4 weeks. In the early rehabilitation



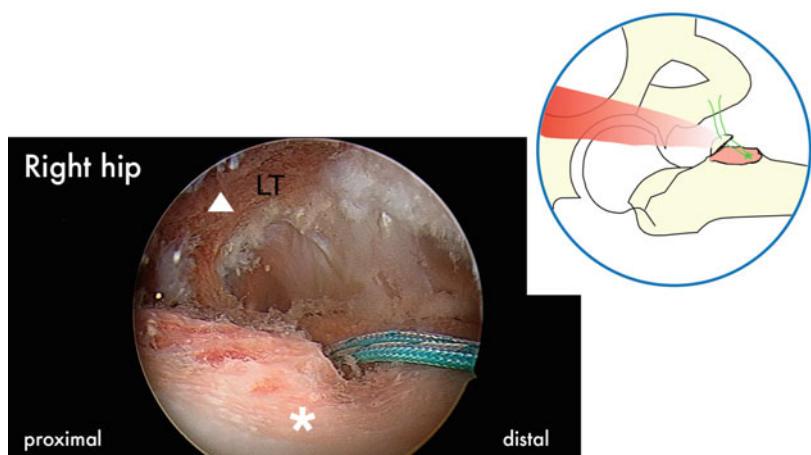
**Fig. 2** (a) The arthroscopic portals used are shown in a right hip, with the patient in the supine position. Bone landmarks reference lines are shown. Two portals are used, both vertically oriented 1–2 cm and positioned lateral to the line between the anterosuperior iliac spine and the central axis of the patella. (b) The endoscopic portals used are shown in a right hip, with the patient in the supine

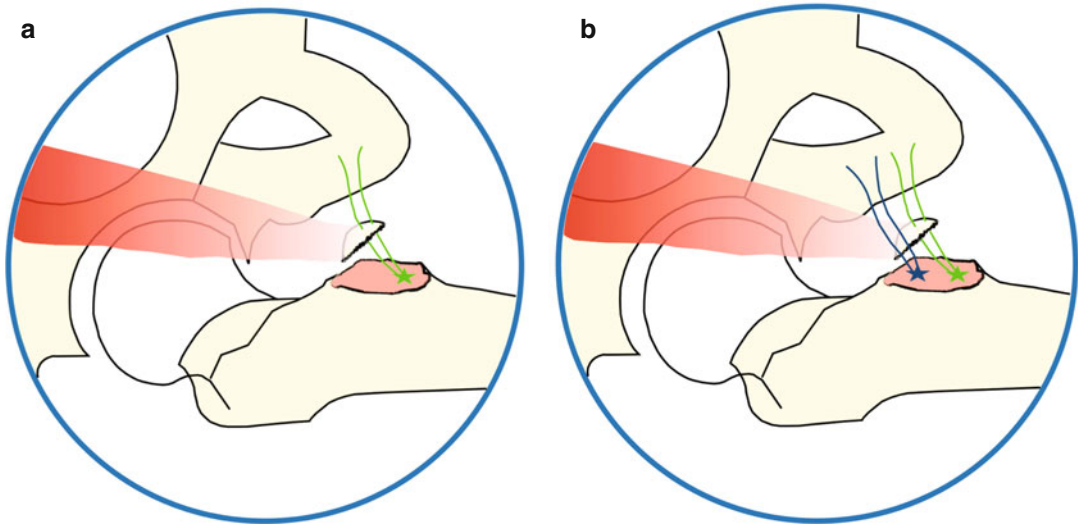
position, under anteroposterior fluoroscopic guidance with the hip externally rotated. The anteroproximal viewing portal is established to gain access to the proximal aspect of the lesser trochanter. The anterodistal working portal is then established 3–4 cm distal to the anteroproximal portal, reaching the distal aspect of the lesser trochanter under fluoroscopic guidance

**Fig. 3** Arthroscopic view from the proximal portal in a right hip, showing partial resection of the lesser trochanter. A bone block is progressively formed that corresponds to the tip of the lesser trochanter (LT, triangle). This bone block contains the intact iliopsoas posterior tendinous insertion. (\*asterisk: trochanteroplasty footprint)



**Fig. 4** Arthroscopic views from the proximal portal in a right hip. An anchor is inserted on the trochanteroplasty footprint (asterisk), both distally and anteriorly relative to this footprint. The triangle indicates the tip of the lesser trochanter

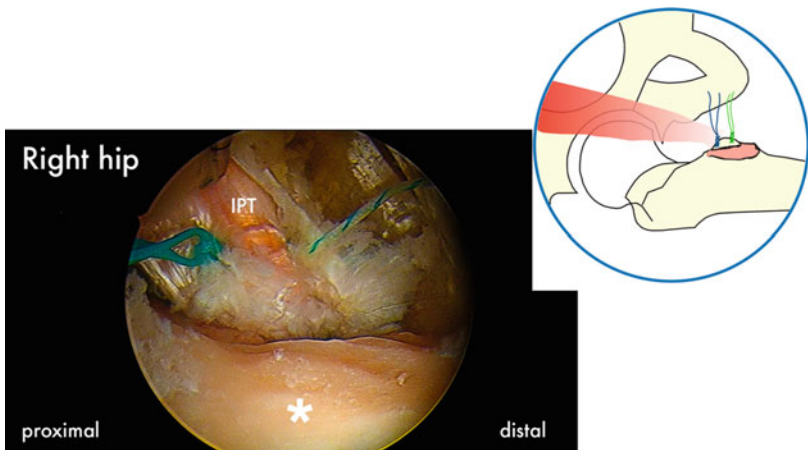




**Fig. 5** (a) Complete bone resection is performed, allowing the bone block that contains the IPT to be mobilized. (b) a second implant is placed in the medial femoral

cortical bone, both proximally and anteriorly relative to the footprint of the trochanteroplasty

**Fig. 6** Finally, the suture anchors are passed through the proximal segment of the iliopsoas tendon (IPT) by means of any suture passer and subsequently tied and reinserted proximally in the trochanteroplasty footprint. The asterisk indicates the footprint of the trochanteroplasty



**Fig. 7** Anteroposterior radiograph of right proximal femur showing lesser trochanter resection (asterisk). A right hip is shown with the patient in the supine position, with no traction and with external rotation of the operative leg



phase, hip passive range of motion begins during week 1 and is restored after 2–3 weeks. Active supine or sitting leg raise and forceful rotation should be avoided for at least 6 weeks.

## Cross-References

- ▶ [Hip Arthroscopy: Portal Placement.](#)
- ▶ [Physical Examination of the Hip and Pelvis.](#)
- ▶ [Surgical Technique: Iliopsoas Tendon Release from Lesser Trochanter.](#)

## References

1. Kivlan BR, Martin RL, Martin HD. Ischiofemoral impingement: defining the lesser trochanterischial space. *Knee Surg Sports Traumatol Arthrosc.* 2017;25(1):72–6.
2. Singer AD, Subhawong TK, Jose J, Tresley J, Clifford PD. Ischiofemoral impingement syndrome: a meta-analysis. *Skelet Radiol.* 2015;44(6):831–7.
3. Tosun O, Algin O, Yalcin N, et al. Ischiofemoral impingement: evaluation with new MRI parameters and assessment of their reliability. *Skelet Radiol.* 2012;41:575–87.
4. Safran M, Ryu J. Ischiofemoral impingement of the hip: A novel approach to treatment. *Knee Surg Sports Traumatol Arthrosc.* 2014;22:781–5.
5. Jo S, O'Donnell JM. Endoscopic lesser trochanter resection for treatment of ischiofemoral impingement. *J Hip Preserv Surg.* 2016;3(2):146–53.
6. Hatem MA, Palmer IJ, Martin HD. Diagnosis and 2-year outcomes of endoscopic treatment for ischiofemoral impingement. *Arthroscopy.* 2015;31:239–46.
7. Gómez-Hoyos J, Schröder R, Palmer IJ, Reddy M, Khoury A, Martin HD. Iliopsoas tendon insertion footprint with surgical implications in lesser trochanterplasty for treating ischiofemoral impingement: an anatomic study. *J Hip Preserv Surg.* 2015;2:385–91.
8. Corrales R, Mediavilla I, Margalet E, Aramberri M, Murillo-González JA, Matsuda D. Endoscopic lesser trochanter resection with refixation of the iliopsoas tendon for treatment of ischiofemoral impingement. *Arthrosc Tech.* 2018;7(4):e321–5. <https://doi.org/10.1016/j.eats.2017.09.010>.