Technical note

Minimally invasive medial hip approach

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ABSTRACT

The medial approach to the hip via the adductors, as described by Ludloff or Ferguson, provides restricted visualization and incurs a risk of neurovascular lesion. We describe a minimally invasive medial hip approach providing broader exposure of extra- and intra-articular elements in a space free of neurovascular structures. With the lower limb in a “frog-leg” position, the skin incision follows the adductor longus for 6 cm and then the aponeurosis is incised. A slide plane between all the adductors and the aponeurosis is easily released by blunt dissection, with no interposed neurovascular elements. This gives access to the lesser trochanter, psoas tendon and inferior sides of the femoral neck and head, anterior wall of the acetabulum and labrum. We report a series of 56 cases, with no major complications: this approach allows treatment of iliopectineus muscle lesions and resection or filling of benign tumors of the cervical region and enables intra-articular surgery (arthrolysis, resection of osteophytes or foreign bodies, labral suture).

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1. Introduction

Ludloff[1,2] first described a trans-adductor approach to the hip, passing forward of the adductor longus and brevis and behind the pectinate muscle [3]. Ferguson and Kiely et al. [4,5] described an approach between the adductor longus and brevis and the adductor magnus (Fig. 1). Both provide a narrow view of the inferior joint region and involve risk to both the anterior and posterior branches of the obturator nerve [6]. Given the technical difficulties, despite subsequent modifications [7], these approaches are little used. We here describe an original minimally invasive approach anterior to all of the adductor muscles (adductor longus, adductor brevis, pectinate and adductor magnus), which we call the “medial hip approach”, giving access to the iliopsoas tendon and the inferior intra-articular region, without risk of neurovascular lesion and with enlarged exposure facilitating the numerous procedures that will be detailed below.

2. Technique

The patient is positioned in dorsal decubitus, with the hip in flexion-abduction-external rotation, in the so-called “frog-leg” position. The skin incision begins at the groin fold and follows the adductor longus muscle, the relief of which is easily seen in this position, for about 6 cm. The medial accessory saphenous vein may cross the incision superficially and should be released and inclined outward. Lymph vessels are not encountered in this space. The aponeurosis of the adductor longus is then incised, taking care not to dissect further forward or beyond the aponeurosis, so as to conserve the femoral vascular pedicle. A slide plane between all of the adductors and the aponeurosis is easily released by blunt dissection, with no interposed neurovascular elements. This gives the tip of the forefinger access to the lesser trochanter, which can be fully palpated in this position: Hohmann retractors can then be fitted on either side, while keeping bone contact. At this point, the lesser trochanter is perfectly visualizable, with the iliopsoas conjoint tendon insertion downwards and inwards. Isolated iliopsoas conjoint tendon surgery is now feasible. To approach the capsule, the tendon is identified and the lateral retractor is repositioned inwards of the psoas tendon, between tendon and capsule, to displace the tendon laterally and expose the capsule. Above, the medial circumflex arteriovenous pedicle of the hip crosses the capsule and can be released from the posterior capsular plane by raspatory and inclined upward. The Hohmann retractor under the medial circumflex arteriovenous pedicle and resting on the anterosuperior wall of the acetabulum allows all the superior part of the capsule to be exposed. Capsule dissection can be extended beyond the capsule, depending on the joint regions to be exposed. Arthrotomy is then performed, with an incision along the axis of the femoral neck and two other incisions, one at the base of the neck and the other peripheral to the anterior-superior acetabular wall, conserving the labrum and creating a book-form opening. The retractors are then

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positioned intra-articularly on either side of the neck; the medial retractor can thus rest against the anterior acetabular wall; a third retractor can be positioned on the superior acetabular wall and push back the circumflex pedicle. The whole anterior half of the head, the base of the neck to the lesser trochanter and the anterosuperior, anterior and antero-inferior acetabular walls and labrum are thus exposed (Fig. 2).

At end of surgery, the capsule can be sutured tight. If necessary, the adductor longus can be lengthened by tenotomy of the white fibers. Hemostasis is checked; a drain is fitted; and the adductor longus aponeurosis is sutured before skin closure (film). Briefly, the key-points are: to follow the space between the adductor muscles and their aponeurosis, to incline the iliopsoas conjoint tendon outward and the circumflex pedicle upward, and to dissect the capsule before opening it.

3. Present series

Fifty-six patients were operated on between August 2007 and January 2014. Mean age was 47.3 years (range, 18–76 years) and the F/M sex ratio 1.07. The following procedures (sometimes associated) were performed using the "medial hip approach":

- Extra-articular: lengthening, longitudinal incision or tenotomy of the iliopsoas or adductor longus muscle (44 cases);
- Intra-articular: osteoid osteoma (two cases), capsule arthrolysis (36 cases), antero-inferior cervical osteoplasty/osteophytectomy (three cases), intra-articular foreign-body ablation (post-traumatic, osteochondromatosis) (two cases), ablation of malunion following fracture-dislocation of the femoral head (three cases), 5-o’clock labral lesion suture (one case), bone biopsy (one case), and curettage and filling of chondroma (two cases).

There was one early surgical revision for postoperative hematoma requiring evacuation, without sequelae. There were no cases of lymphedema or other surgery-related complications. Healing was systematically achieved within 21 days.

Fig. 1. Cross-sectional views of various approaches. A. Ludloff’s approach: between the adductor longus and pectineus muscles (crossing the anterior branch of the obturator nerve). B. Ferguson’s approach: between the adductor brevis and magnus muscles (crossing the posterior branch of the obturator nerve). C. Medial hip approach: between the adductor and pectineus muscles anteriorly and their aponeurosis posteriorly. Q: Quadriceps; IP: iliopsoas muscle; P: pectinate muscle; AL: adductor longus muscle; G: gracilis muscle; AB: adductor brevis muscle; AM: adductor magnus muscle; FV: femoral vessels; Nerves: anterior and posterior obturator nerves.

Fig. 2. Anatomic region accessible on the medial hip approach. Right hip joint in frog’s-leg position.
4. Discussion

The medial hip approach can be very useful in recent fracture-dislocation of the hip, enabling fixation of inferior head fragments or extraction [8]. Other medial approaches to the hip require painstaking dissection of anterior or posterior obturator nerve structures, and provide inadequate visualization. The main indication for the medial hip approach is psoas tendon tenotomy, whether for impingement with an acetabular implant [9] or for chronic enthesopathy [10]; in such cases, an articular approach need not necessarily be associated. In this indication, open surgery frequently leads to classical neurovascular complications [11–14], which were not found in the present series thanks to the safety of the “medial hip approach”. The alternative attitude is arthroscopic tenotomy [15,16], but this does not allow the same degree of precision for certain procedures (anterior capsule lengthening, longitudinal incision or resection) and involves a long operation, a long learning curve and extra cost. Iliopsoas tenotomy on the medial approach can be associated to release of capsular and ligamentous adherences, facilitating recovery of range of motion. The medial approach is quick and allows the above procedures to be performed on a day-care basis.

5. Conclusion

The medial hip approach is simple, minimally invasive, and allows numerous procedures to be performed with minimal risk of neurovascular complications if a resection plane forward of the adductor muscles and behind the adductor longus aponeurosis is respected and the capsule is exposed inward of the iliopsoas tendon.

Disclosure of interest

P. Chiron is a consultant for Zimmer, Smith & Nephew and Sanofi and receives royalties from Zimmer and Integra. The other authors have no conflicts of interest to declare.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.otsr.2014.06.009.

References