

Extracapsular vs standard approach in hip arthroscopy

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Summary. *Background:* Over the last decades, the arthroscopic treatment of hip pathology has highly grown thanks to the evolution of surgical and diagnostic techniques and instrumentation development. Furthermore the higher life expectancy and functional request make younger patients to be evaluated more frequently for non-arthrotic hip pathologies like labral lesion, FAI, cartilage tears. Treatment substantially has to be chosen between arthroscopy and arthrotomy. This study pretends to compare the clinical outcome between two different arthroscopic access techniques: the traditional one and the extrarticular one (OUT-IN) we are using regularly in our clinic. *Methods:* From 2012 to 2014, 37 patients with FAI were treated with traditional technique (Group A) and 28 with extra-articular access (Group B). Indication to surgery treatment was given on the basis of radiological imaging (Pelvis Rx, Hip Rx in AP, Frog Leg view, Dunn view, Pelvic MRI) (8, 9), dynamic range of motion, clinical examination and functional scores (MHHS, MHOT). Pain was scored with NRS. Minimum follow up for each patient was 12 month with clinical controls and functional score recording at 3-6-12 month after surgery. Complications or iatrogenic lesions were assessed. *Results:* At 12 month after surgery there was no statistically significant differences in hip R.O.M., MHHS and MHOT (33) score. We observed an higher number of iatrogenic lesions and complications in the group A (standard technique) than group B. *Conclusions:* Hip arthroscopy is a viable and reproducible alternative technique when treating articular lesion such as femur-acetabular impingement and it is demonstrated by the increase of functional score. We can furthermore appreciate that an extra-articular access technique leads to a vary good outcome both in hip R.O.M. and functional scores and has a very low number of complications and iatrogenic lesions. (www.actabiomedica.it)

Key words: extra-capsular, hip, arthroscopy, femoro-acetabular, impingement

Introduction (1-6)

Over the last decades, the arthroscopic treatment of hip pathology has highly grown thanks to the evolution of surgical and diagnostic techniques and instrumentation development. Furthermore the higher life expectancy and functional request make younger patients to be evaluated more frequently for non-arthrotic hip pathologies like labral lesion, FAI, cartilage tears. Treatment substantially has to be chosen between arthroscopy and arthrotomy.

A large number of authors have proved the lesser invasiveness and postoperative complication rate, the

higher anatomical respect and the faster recovery after arthroscopic treatment. Moreover arthroscopy allow a better and wider vision of the articular and extra-articular space.

Surgical indications are nowadays various: femoro-acetabular impingement (FAI), labral tears, cartilage and bone defects. Treatment of such pathologies delays the coxo-femoral arthrotic degeneration. The presence of arthrotic signs before surgery is a negative predictive factor on the final outcome and pain persistence.

Therefore accurate patient selection becomes essential: the parameters to be considered are arthrotic coxo-femoral signs, associated rheumatological disor-

ders and age, however Benjamin G and Dror L. (11) found no statistical differences in clinical outcome between population under 30 and over 55 patients after hip arthroscopy.

This study pretends to compare the clinical outcome between two different arthroscopic access techniques: the traditional one and the extra-articular one (OUT-IN) we are using regularly in our clinic.

Positioning

Patient positioning is a matter of surgical preference. However, there are circumstances in which one decubitus must be chosen instead of the other.

The supine position offers a more intuitive viewing of the articulation and any standard (slightly) modified traction/fracture table can be used. A study published in 2007 demonstrated that it is possible to avoid using the pelvis blocking cylinder to support the pelvis in order to reduce the risk of damaging the pudendal nerve (12).

The supine decubitus, however, provides not comfortable posterior access (posterior-lateral), and when treating obese patients, the fat tissue may interfere with the operator's movements. In the lateral position the fat tissue tends to lay far from the operating field and allows an easier access through the posterior portals. The drawback of this decubitus is that the arthroscopic fluid may pour out in the abdominal cavity.

Since FAI treatment has become the most important intervention performed in hip arthroscopy, a lot of surgeons have chosen the supine position because it provides a better and easier intra-operative flexion-extension hip motion.

Portals (1, 13-16)

Many studies on the topic state that the most commonly used accesses are the anterior and the anterolateral, followed by the posterior-lateral. In the out-in technique the portals utilized are the anterior-lateral and the mid-anterior.

Traditional technique (18)

In traditional technique the accesses are made under fluoroscopic control. The anterolateral portal (1 cm superior and 1 cm anterior from the apex of the greater trochanter) is the first to be performed. After a proper articular distraction a 17G needle is deeply introduced, with a cranial angle of 15°-20° and a posterior angle of 10°-15° as far as the articular space.

When reaching the capsule the needle tip must stand cranially to the femoral head to avoid damage of the articular cartilage surface, but at the same time widely caudal to the acetabular rim to avoid labral tears. When entering the capsule a loss of pressure is felt due to intra-articular negative pressure produced by the hip distraction.

Subsequently a Nitinol wire is inserted through the needle till it stops against the bottom of the acetabulum. Over the wire are then introduced the dilators and finally the arthroscope.

The second portal is performed under arthroscopic view with the same technique.

Extrarticular access (OUT-IT)

In our technique the patient is in supine decubitus on a traction table. The first phase of the surgery is performed without traction and without fluoroscopic control. The accesses are the anterior-lateral for the optic and the mid anterior for instrumentation. After the incision of the skin, a blunt dissection was performed to reach the anterior-lateral aspect of the capsula. The initial triangulation is made between capsula and subfascial soft tissues, the capsula is then incised to reach the head-neck junction of the femur. Checked the right position, a T capsulotomy is performed.

Then the extrarticular space and FAI are evaluated by dynamic tests. If planned in the pre-operative time, the acetabular rim-trimming was performed. Subsequently after a 10 mm hip distraction, the articular space is explored and cartilage and labral tears are treated. Finally after traction release the head-neck junction osteochondroplasty is performed if necessary.

Discharge and rehabilitation program

Patients are discharged the same afternoon of the surgery with proper antithromboembolic therapy and anti ossification prophylaxis with Etoricoxib 90 mg/die for 21 days.

Postoperative recommendations are the following: passive cycle movements of the hip since 2 day after surgery, deambulation without load on the operated hip for the first 2 weeks, then progressive load till the normal deambulation, it is also recommended to avoid rotation of the hip for the first 2 weeks.

Every patient received a two phase rehabilitation protocol with exercises written and painted to be carried out in the following 6 week.

Materials and methods

It has been demonstrated that iatrogenic labral tears rates produced during the first portal opening with standard technique reach about 20% (3).

The aim of this study is to compare clinical outcomes in patients undergone to hip arthroscopy in our Clinic performed with standard technique or extrarticular access.

From December 2012 to February 2014 we enrolled 65 consecutive patients treated for FAI. 37 patients were treated with traditional technique (Group A) and 28 with extrarticular access (Group B). Indication to surgery treatment was given on the basis of radiological imaging (Pelvis Rx, Hip Rx in AP, Frog Leg view, 45° Dunn view, false profile and Pelvic RMN) (8, 9), dynamic range of motion, clinical examination and functional scores (MHHS, MHOT). Pain was scored with NRS. Minimum follow up for each patient was 12 month with clinical controls and functional score recording at 3-6-12 month after surgery.

Results

In group A, 25 patients presented CAM impingement and 12 patients presented a combined CAM-PINCER impingement. During the procedure we observed 29 labral lesions.

In group B, 7 patients presented CAM impingement and 21 presented a combined CAM-PINCER impingement. During the procedure we observed 17 labral lesion.

Group A at 12 months from surgery reported an increase of 10 degrees of flexion while other articular movement remained almost unvaried (figure 1).

Group B at 6 months from surgery reported an average increase of 12 degrees of flexion, 5 degrees of abduction, 2 degrees of adduction, 4 degrees of internal rotation and 3 degrees of external rotation (figure 2).

Valuated with the MHHS, group A presented an average pre-surgery score of 57.1 increased to 70.3 after 12 months from surgery.

Valuated with the same score, group B presented an average pre-surgery score of 63 increased to 80.2 after 12 months from surgery (figure 3)

Valuated with MHOT (33) group A presented an average pre surgery score of 43.8 increased to 68.6 after 12 months; group B an average pre surgery score

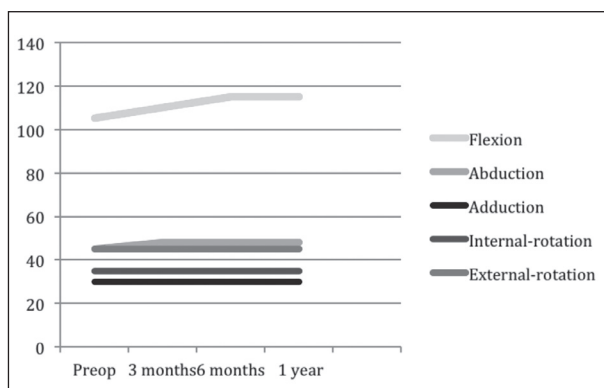


Figure 1. Group A: pre-surgery articulation and after 6 months

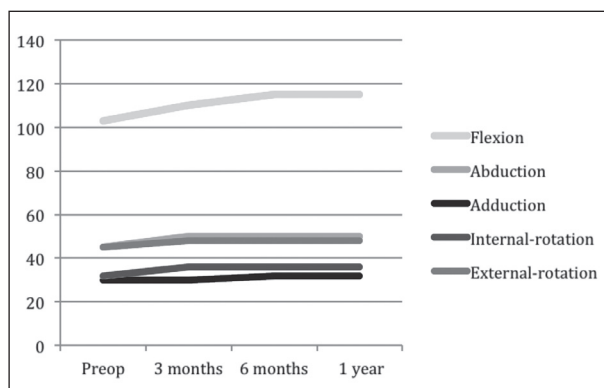


Figure 2. Group B pre-surgery articulation and after 6 months

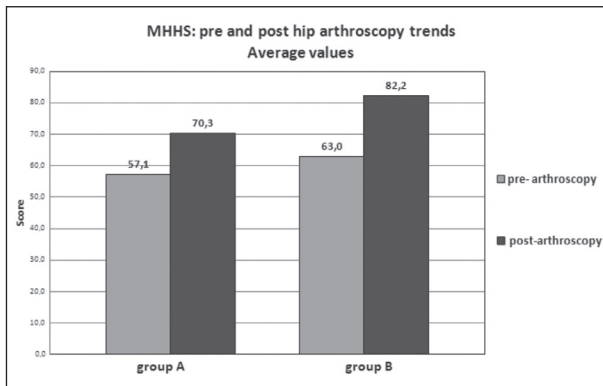


Figure 3. Improvement in QoL after hip arthroscopy: comparison between pre and post arthroscopy in group A and B using Modified Harris Hip Score (MHHS)

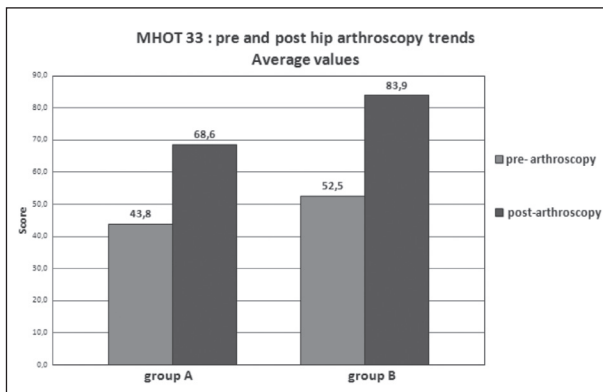


Figure 4. Improvement in QoL after hip arthroscopy: comparison between pre and post arthroscopy in group A and B using Mahorn Hip Outcome Tool 33 (MHOT)

of 52.5 increased to 83.9 after 12 months from surgery. (figure 4)

Complications

In group A we observed: 2 iatrogenic labral perforation and 3 femoral head chondral scuffing doing the first portal. Furthermore we had in the same group (A) one case of obturator nerve-palsy due to hip distraction. This palsy recovered completely in 4 weeks.

We didn't report iatrogenic chondral or labral lesion in group B.

None patient underwent a second hip arthroscopy, one patient underwent THA during the following 24 months due to reactive arthritis.

Gupta and Redmond in their study observed a mayor complication rate of 0.4% during hip arthroscopy, a minor complication rate of 4.1% and a reintervention rate (new hip arthroscopy or THA) of 4.03% (7).

Harris and Erickson valuated the outcome of FAI treatment with open technique vs mini-open technique vs arthroscopy technique. They found out a statistically significant decrease in complication rate when using the arthroscopic technique. They also observed a lesser percentage of patients undergone early THA after arthroscopic technique than open or mini-open technique (10).

Our study is in line with this results with a lesser complication rate probably due to smaller study groups used (12).

Discussion

Hip arthroscopy is a viable and reproducible alternative technique when treating articular lesion such as femoral-acetabular impingement and it is demonstrated by the increase of functional score.

This procedure with the usual technique starts from the central compartment with a potential risk of chondral and labral injury. The extracapsular approach is attractive because the instruments are introduced after the capsulotomy and along the femoral head/neck junction which is devoid of articular cartilage and enough distant from the labrum to avoid injury (19).

We can furthermore appreciate that this different access technique leads to a better outcome both in hip range of motion, especially flexion, and in "quality of life" with higher functional scores.

Group B at 12 months after surgery obtained an average increase in MHHS of 6 points higher than group A. Also considering MHOT we observed an average increase of group B 6.6 points higher than group A.

With the extra-articular access is possible to obtain two important advantages that explain these differences:

1. The articular capsule is opened under arthroscopic control limiting the possibility of iatrogenic cartilage and labral lesions. This can result in reduced

pain after surgery and in better clinical outcome.

2. Maintaining hip distraction during the arthroscopic accesses is not necessary. Distraction is applied only for a few minutes during the surgery to access the central compartment and the traction force needed is lower than standard technique because the capsulotomy is already performed; as a consequence we have less soft tissue trauma and a fewer pudendal nerve damage.

At least the use of X-ray is unnecessary which prevents patient and surgeons to be exposed to ionizing radiations, makes the preparation of the operating theatre faster and easier and permits a reduction of surgery time.

Conclusions

Extracapsular approach in hip arthroscopy, in our series, seems to be a valid alternative to central compartment approach. More studies, with large series are needed to confirm these results.

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