Arthroscopic Loose Body Removal after Hip Fracture Dislocation: Experiences in 7 Cases

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Objective: *The aims of the present study were to describe the technique of hip arthroscopy for osteochondral loose body removal after posterior hip dislocation and report its preliminary results.*
Material and Method: *We reported consecutive patients undergoing hip arthroscopy for osteochondral fragment after sustaining fracture-dislocations. Seven patients who sustained traumatic hip dislocation with incarcerated osteochondral were included in this study. All patients had standard AP pelvis x-rays and 3D-CT scans. After closed reduction, all patients underwent hip arthroscopy in which loose bodies were removed and labral pathology debrided.*
Results: *The mean follow-up was 15.7 months. The average Harris Hip Score was 89.8. No patient developed any of the complications commonly associated with arthrotomy including avascular necrosis, heterotopic ossification, and nerve injury.*
Conclusion: *Arthroscopic treatment of intra-articular loose bodies after hip fracture-dislocations allows excellent visualization of the joint and facilitated straightforward removal of the fragment.*

Keywords: *Hip arthroscopy, Osteochondral loose body, Hip-dislocation*

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Loose fragment removal is indicated when a nonconcentric reduction results due to interposition of debris within the joint after hip reduction. Most of the surgical procedures, such as anterior or posterior hip arthrotomy and surgical dislocation or hip distraction to allow loose body removal were performed through open techniques. Hip arthroscopy has been indicated for the treatment of avascular necrosis and removal of loose bodies. The rate of avascular necrosis was reported as high as 37%[1,2]. Although hip arthroscopy is technically demanding because of the extensive muscular and capsular structures surrounding the joint, it provides an excellent view of the femoral head and acetabulum while minimizing the disruption of soft tissue and capsuloligamentous structures. We describe our technique of hip dislocation arthroscopy to remove an osteochondral fragment after a posterior hip dislocation. We have used it since 2004 and now report our experience and the preliminary results in seven cases.

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Material and Method

Seven patients (two females and five males) indicated for surgery of traumatic hip dislocation with retaining of loose fragments in the joint were reported in this study. Pre- and post-operative radiographs and computed tomography (CT) scans were performed to confirm the diagnosis and to evaluate the results of the treatment. Clinical follow-up was undertaken using the Harris Hip Scores (HHS), stability of the hip, range of motion, pain, cosmetic results and serial radiographs. The data were presented as means with standard deviation (SD).

Surgical techniques

The patient is positioned supine on the fracture table. The contralateral extremity is flexed, abducted and external rotation to accommodate

Fig. 1 (A) Prereduction radiograph reveals posterior hip fracture and dislocation (B) Postreduction radiograph demonstrate non-concentric reduction with large loose fragments entrapped in the joint

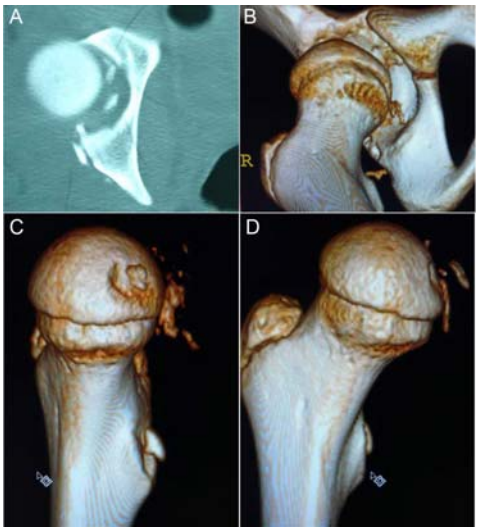

Fig. 2 (A-D) Preoperative 3D-CT scans reveals multiple loose bodies entrapped in the joint and joint space widening

positioning of the image intensifier between the legs. Traction is then applied to the operative extremity, and distraction of the joint is confirmed by fluoroscopic examination (Fig. 3A). The hip is then prepped and draped. Three standard portals, including 2 laterals (anterolateral and posterolateral) and 1 anterior position, provide optimal access for all pathology in the central compartment. A spinal needle is used in pre-positioning for the anterolateral portal. The needle courses above the superior tip of the trochanter and then passes under the lateral lip of the acetabulum entering the hip joint. Distension of the joint with 40 cc of normal saline solution (NSS) disrupts the vacuum and facilitates adequate distraction. The intracapsular position of the spinal needle is confirmed by backflow of fluid. The site of the anterior portal coincides with the intersection of a sagittal line drawn distally from the anterior superior iliac spine and a transverse line across the superior margin of the greater trochanter. The direction of this portal courses approximately 45° cephalad and 30° toward the midline. The anterolateral and posterolateral portals are positioned directly over the superior aspect of the trochanter at its anterior and posterior borders.

Portal placement

The anterolateral portal lies most centrally in the "safe zone" and thus is the portal placed first. We use a Wissinger rod penetrated through the anterolateral portal at the anterior margin of the greater trochanter and keep the rod parallel to the floor under fluoroscopic guidance. Pass the cannula obturator over the rod into the joint. Subsequent portal placements are assisted by direct arthroscopic visualization. Place a shaver into the posterolateral or anterior portal to clean the joint and identify the free fragments, then insert a grasper to retrieve the loose fragments.

Results

Seven cases of retained loose fragments after hip reduction were treated by arthroscopic loose body removal. There were two females and five males with a mean age at the time of surgery of 23 years (SD = 12). The mean follow-up was 15.7 months (SD = 6.5). All

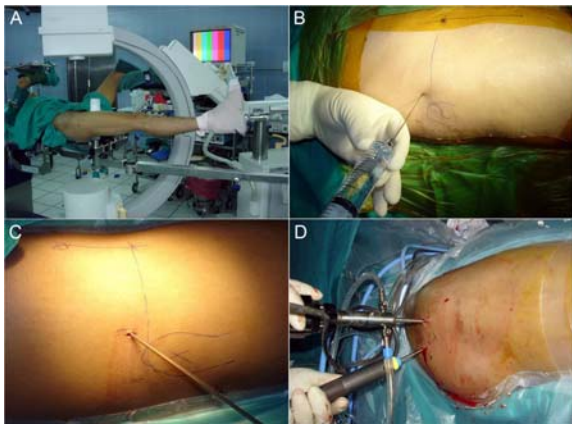

Fig. 3 (A) The patient is positioned supine on the fracture table. (B) Injection of NSS solution to distend the joint (The small picture reveals correct intraarticular position which is demonstrated by displacement of the femoral head.). (C) Demonstrating the 3 portals; Anterior (A), Anterolateral (AL), Posterolateral (PL). A Wissinger Rod is inserted through the anterolateral portal under fluoroscopic guidance (D) Inserting the scope through anterolateral portal and motorized shaver through the posterolateral portal

Fig. 4 (A) Visualization of the bony loose fragments entrapped in the joint. (B) Arthroscopic view after loose fragments removal. (C) Demonstrating the posterior acetabular rim fracture. (D) The loose fragments removed from the hip

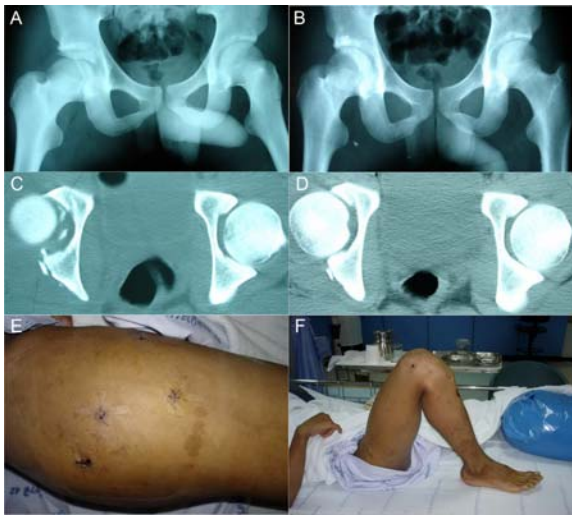

Fig. 5 (A, C) Preoperative radiograph and CT scans demonstrating multiples loose fragments retaining in the hip joint. (B, D) Postoperative radiograph and CT scans reveal no obvious loose bodies. (E) Cosmetic appearance (F) Range of movement of the hip the 5th day postoperatively

patients had good stability of the hip after surgery. No recurrent dislocation was observed. All patients had full range of motion, no hip pain and were satisfied with the cosmetic results. This improved to a post-operative score at follow-up was 89.8 $\pm$ 4.7 ($p = 0.003$). No patient developed any of the complications commonly associated with open hip arthrotomy, including avascular necrosis, heterotopic ossification, and nerve injury.

Discussion

Removal of intra-articular fragments of bone or cartilage, especially if the reduction is not concentric, is another indication for surgery. Commonly, small displaced posterior wall acetabular fracture dislocation is treated with urgent closed reduction, followed by open reduction and internal fixation. The fragments that require removal are interposed between the articular surface of the head and the acetabulum. Small fragments that are seen in the fovea and do not impinge on the head need not be removed[3]. Moed et al showed that removal of even small incarcerated "debris" fragment was important for improved outcomes[4].

The surgical exposure is selected based on the injury and debris location. For both anterior and posterior exposure, surgical dislocation or hip distraction may be needed, especially for fossa acetabuli debris. Hip arthroscopy for fragment removal has its advocates. Acutely after traumatic dislocation, hip arthroscopy may be complicated if joint distension is needed. Barlett et al described cardiac arrest resulting from hip arthroscopy in a patient with an acetabular fracture and associated hip joint debris[5-7].

The hip arthoscopy technique is relatively new, and most orthopaedic surgeon may not be familiar with it. It does offer some distinct advantages. However, the most important of redislocation of the hip is not needed to clean the joint and additional vascular insult to the head is avoided. The rate of avascular necrosis of femoral was reported as high as 37% after open surgery.

In this study, we found that all patients had full range of motion, no hip pain and were satisfied with the cosmetic results. No recurrent dislocation was reported.. In addition, There was no patient having complications.The limitation of this study was related to the very small numbers of case series and short-term follow-up period. Future research in the larger group of patients and longer term follow-up is needed.

Conclusion

The arthroscopic loose body removal after hip fracture dislocation was found safe, effective

and having less morbidity. We advocated the early arthroscopic retrieval of the loose fragments to avoid post-traumatic arthritis and the complications from open hip surgery. Using this technique, we are able to avoid the larger incision required by an arthrotomy and then can decrease the patient's overall morbidity associated with this condition.

References

1. Epstein HC. Posterior fracture-dislocations of the hip: long-term follow-up. J Bone Joint Surg Am 1974; 56: 1103-27.
2. Epstein HC. Traumatic dislocations of the hip. Clin Orthop Relat Res 1973; (92): 116-42.
3. Rosenthal RE, Coker WL. Posterior fracture-dislocation of the hip: an epidemiologic review. J Trauma 1979; 19: 572-81
4. Moed BR, WillsonCarr SC, Watson JT. Results of operative treatment of fractures of the posterior wall of the acetabulum. J Bone Joint Surg Am 2002; 84-A: 752-8
5. Bartlett CS, DiFelice GS, Buly RL, Quinn TJ, Green DS, Helfet DL. Cardiac arrest as a result of intraabdominal extravasation of fluid during arthroscopic removal of a loose body from the hip joint of a patient with an acetabular fracture. J Orthop Trauma 1998; 12: 294-9.
6. Sampson TG. Complications of hip arthroscopy. Clin Sports Med 2001; 20: 831-5.
7. McCarthy JC, Lee JA. Hip arthroscopy: indications, outcomes, and complications. Instr Course Lect 2006; 55: 301-8.

ผลการใช้กล้องส่องหาและนำชิ้นส่วนหรือเนื้อเยื่อที่หลุดลอยในข้อสะโพกจากการเกิดข้อสะโพกเคลื่อนหลุด: รายงานผลจากผู้ป่วยจำนวน 7 ราย

บัญชา ชื่นชูจิตต์, ประกาศิต สงวนจิตร, มารุต อรุณากูร, เจน จิตะพันธ์กุล, ธนพงษ์ ไวทยะวิญญู

***วัตถุประสงค์**: เพื่อรายงานผลการผ่าตัดส่องกล้องข้อสะโพกเพื่อทำการนำเศษกระดูกในข้อสะโพกออก ในกรณีที่ผู้ป่วยได้รับการบาดเจ็บข้อสะโพกหลุดและมีเศษกระดูกค้างอยู่ในข้อ*

***วัสดุและวิธีการ**: รายงานนี้มีผู้ป่วยจำนวนทั้งสิ้น 7 รายที่ได้รับการผ่าตัดด้วยวิธีนี้ ก่อนผ่าตัดผู้ป่วยทุกรายได้รับการถ่ายภาพรังสีและเอกซเรย์คอมพิวเตอร์ชนิดสามมิติ โดยการผ่าตัดส่องกล้องข้อสะโพก เพื่อนำเศษกระดูกออกจากเบ้าสะโพกหรือทำการตกแต่ง labrum จะทำหลังจากที่ผู้ป่วยได้รับการดึงข้อสะโพกเข้าที่แล้ว*

***ผลการศึกษา**: ผู้ป่วยได้รับการติดตามเป็นระยะเวลาเฉลี่ย 15.7 เดือน โดยค่าเฉลี่ยของ Harris Hip Score เป็น 89.8 ทั้งนี้ ภายหลังจากการผ่าตัดไม่พบว่ามีผู้ป่วยรายใดเกิดผลแทรกซ้อนจากการผ่าตัด เช่น หัวกระดูกสะโพกขาดเลือด การบาดเจ็บของเส้นประสาท กระดูกหรือแคลเซียมพอกบริเวณกล้ามเนื้อสะโพก ซึ่งภาวะแทรกซ้อนดังกล่าวพบได้บ่อยในกรณีผ่าตัดข้อสะโพกแบบเปิด*

***สรุป**: การผ่าตัดส่องกล้องข้อสะโพกเพื่อนำเศษกระดูกในข้อสะโพกออกนั้น เป็นวิธีการผ่าตัดซึ่งสามารถเห็นพยาธิสภาพในข้อได้อย่างชัดเจน นอกจากนี้ยังเป็นวิธีการผ่าตัดที่ทำได้ง่ายและได้ผลการรักษาที่ดี*