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Posterior Kalça Çıkığının Eşlik Ettiği Asetabulum Kırıklarında Klinik ve Radyolojik Sonuçlar

Clinical and Radiological Outcomes of Posterior Hip Dislocation with Acetabular Fractures

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ÖZET

GİRİŞ ve AMAÇ: *Çalışmamızda asetabulum kırıklarına eşlik eden posterior kalça çıkığının insidansı ve bunun asetabulum kırıkları cerrahi tedavisindeki etkileri değerlendirildi.*

YÖNTEM ve GEREÇLER: *Cerrahi olarak tedavi edilen 172 asetabulum kırığı vakası retrospektif olarak değerlendirildi. Bunların 53'ünde posterior kalça çıkığı vardı. Takipleri yetersiz olan 15 hasta çalışma dışı bırakıldıktan sonra kalan 38 hasta son takip bulguları eşliğinde radyolojik ve klinik olarak değerlendirildi. Asetabular kırık tipine göre gruplanarak sonuçlar karşılaştırıldı.*

BULGULAR: *38 hastanın 19'unda (%50) basit tip 19'unda ise kompleks tip asetabulum kırığı mevcuttu. Postoperatif klinik ve radyolojik sonuçlar basit tip kırıklarda istatistiksel anlamlı olarak daha iyiydi. Dokuz hastada (%23.7) preoperatif siyatik sinir lezyonu vardı. Total kalça artroplastisi sekiz hasta için gerekli oldu, bunların üçü ilk yıl içinde avasküler nekroz kaynaklı yapıldı.*

TARTIŞMA ve SONUÇ: *Çalışmamızda asetabulum kırıklarında posterior kalça çıkığı insidansı %30.8 olarak bulundu. Asetabulum kırıklarına posterior kalça çıkıklarının eşlik etmesi klinik ve radyolojik sonuçları kötü olarak etkileyebilmektedir.*

Anahtar Kelimeler: *asetabulum kırığı, posterior kalça çıkığı, kalça artroz*

ABSTRACT

INTRODUCTION: *Our study analyzes the incidence of posterior hip dislocation in the acetabular fractures. The effect of hip dislocation on the surgical treatment of acetabular fracture was also evaluated.*

METHODS: *172 surgically treated acetabular fracture cases were evaluated retrospectively. Of these, 53 patients had posterior hip dislocation with acetabular fractures. Fifteen patients were excluded from the study due to loss of follow-up. Clinical and radiological grading of remaining 38 patients were assessed at the final follow-up. Comparative studies were performed between groups, which were done according to acetabular fracture type, clinical and radiological results.*

RESULTS: *19 (50%) out of 38 acetabular fracture dislocations were simple and 19 (50%) were complex type acetabular fracture. The postoperative clinical and radiological results have been significantly better in simple type fracture group, than the complex acetabular fracture group. Nine patient (23.7%) had preoperative sciatic nerve palsy. Total hip arthroplasty were required in eight patients, three of them had avascular necrosis of femoral head and operated within first year.*

DISCUSSION AND CONCLUSION: *In our study posterior dislocations were seen in 30.8% of acetabular fractures. Posterior hip dislocation accompanies in one third of the acetabular fractures and this may influence the clinical and radiological outcome.*

Keywords: *acetabular fracture, posterior hip dislocation, hip arthrosis*

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INTRODUCTION

Posterior dislocation of the hip may be accompanied many type of acetabular fracture especially fracture involving posterior wall of the acetabulum. Dislocations should be taken into consideration in clinical practice in order to determine the severity and the prognosis of acetabular fractures (1,2). These fracture-dislocation configurations represent approximately 15-40% of all acetabular fractures (3-5).

Posterior hip dislocation with acetabular fracture is invariably a result of high-energy trauma. Complications such as avascular necrosis (AVN) and posttraumatic degenerative arthritis can be physically and socially devastating to these patients. Rates of AVN and osteoarthritis have been reported to be as high as 53 percent and 38 percent, respectively (6-8).

The purpose of the present study is to evaluate the incidence of posterior hip dislocation in the acetabular fractures. The effect of hip dislocation on the surgical treatment of acetabular fracture was also analyzed.

MATERIAL and METHOD

This retrospective study included records of all patients surgically treated with acetabular fracture between January 1, 2005 and December 31, 2014. Overall, 172 patients were identified. Of these, 53 patients had posterior hip dislocation with acetabular fractures. Acetabular fractures were classified according to Letournel – Judet classification system (9). Fifteen patients were excluded from the study due to loss of follow-up. The remaining 38 patients who had been operated by two surgeons were included in the study. All patients dislocations had been reduced by closed reduction under sedation except two cases who necessitate open reduction immediately. Plain radiographs, CT images and sciatic nerve palsy-entrapment were assessed before and after reduction of the hip. Local ethic committee approval was obtained.

Passive range of motion exercises of the hip including isotonic and isometric strengthening exercises were applied to all patients just after the operation. The patients were mobilized toe touch weight bearing for 6 to 12 weeks.

The patients were evaluated clinically and radiographically at an immediate postoperative period of 6 weeks, 3 months, 6 months, one year and annually thereafter. Clinical and radiological grading was assessed at the final follow-up. Preoperative and postoperative plain radiographs and CT images of 38 patients were reviewed and classified. The postoperative radiological results were assessed according to Matta's criteria.Clinical grading was evaluated by Merle d'Aubigne and Postel scoring which has been modified by Matta (10,11). Comparative studies were performed between groups, which were done according to acetabular fracture type, clinical and radiological results.

Statistical Analysis

Statistical analysis of the data obtained from 38 patients was performed by using the chi-square and Fisher's exact tests. A p value of less than 0.05 was considered statistically significant (IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp., USA).

RESULTS

Twenty-nine patients were male and 9 female, with an average age of 42 years (range 18-64) at the time of the trauma. The most common injury mechanism was traffic accidents (35 patients, 92.1%) followed by falling from height (3 patients, 7.9%).The details of the patient demographics were given in Table 1.

Table 1: Demographic Data of The Patients

Number of patients	38
Male:Female	29:9
Average age	42 years (range 18-64)
Average follow up	26 months (range 12-116)
Average time to surgery	5 day (0-18)
Surgical Exposure ***Posterior:Combine***	32:6

Of the 38 patients, 32 had posterior surgical exposure and 6 had anterior and posterior combine exposure. This surgical concept is one of the subjective criteria of the study since progressing to anterior exposure depended on the surgeons' dissatisfaction after posterior open reduction internal fixation (Figure 1).

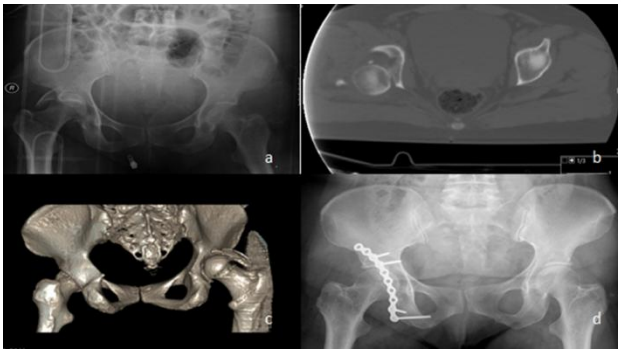

Figure 1:
a:Preoperative pelvis X-Ray of posterior dislocation with acetabular fracture
b: Preoperative axial CT section of posterior dislocation with acetabular fracture
c: Preoperative 3D image of posterior dislocation with acetabular fracture
d: Postoperative pelvis X-Ray of patient

19 (50%) out of 38 acetabular fracture dislocations were simple and 19 (50%) were complex type acetabular fracture. The most common type of acetabular fracture dislocation was transverse with posterior wall fracture (39.5%). The detailed information about the fracture type were given in Table 2.

Table 2: Fracture Type According to Letournel-Judet Classification

Simple Acetabular Fractures	
Posterior wall	14 (36.8%)
Posterior column	1 (2.6%)
Transverse	2 (5.3%)
T type	2 (5.3%)
Complex Acetabular Fractures	
Posterior column + wall	3 (7.9%)
Transverse + posterior wall	15 (39.5%)
Both column	1 (2.6%)

The radiographic results according to the criteria developed by Matta at the final follow-up were excellent in 20 hips (52.6%), good in 4 hips (10.5%), fair in 4 hips (10.5%), and poor in ten hips (26.3%). The clinical outcome results according to the modified Merle d'Aubigne and Postel scoring were as follows: Excellent in 18 (47.4%), good in 7 (18.4%), fair in 5 (13.1%), and poor 8 hips (20.1%).

The postoperative clinical and radiological results have been significantly better in simple type fracture group, than the complex acetabular fracture group (p:0.011 and p:0.026, respectively).

Nine patient (23.7%) had preoperative sciatic nerve palsy. Six of them had complete recovery of neurologic functions but three patients were not improved. There was no iatrogenic sciatic nerve palsy postoperatively. Superficial wound infection was diagnosed in two patients and treated with antibiotics. Total hip arthroplasty were required in eight patients, three of them had avascular necrosis of femoral head and operated within first year.

DISCUSSION

Acetabular fractures are generally associated with high energy trauma, especially vehicle accidents (80%). Letournel et al were analyzed the mechanism of posterior dislocations with acetabular fractures (9). The position of the femur and magnitude of the force is important for dislocations. They stated that the degree of both hip flexion and adduction during impact was the primary factor which determined the type of acetabular fracture and dislocation. Therefore, traffic accident is the most common cause when posterior hip dislocations are associated with acetabular fractures as in our series (92%).

Meena et al (2013) were suggested that posterior hip dislocations were accompanied with acetabular fractures in approximately 40% of cases (5). Briffa et al (2011) were reported as 33% (4). The earlier studies had showed lesser incidence of dislocations than recent literatures. In our study posterior dislocations were seen in 30.8% of acetabular fractures. This difference might be a result of increased velocity of vehicles.

Restoration of articular congruity is the most significant predictive factor of outcome after acetabular fracture fixation (4). Posterior hip dislocation is another well known radiological and clinical prognostic factor. The parameters associated with posterior hip dislocations such as marginal impaction, lesion of the femoral head and comminution cause a negative effect on prognosis and outcome of acetabular fracture (12). We found lower than 70% excellent and good clinical and radiological outcomes compared with acetabular fracture without dislocation.

Briffa et al has found that sciatic nerve palsy was associated in 12% of acetabular fractures and Bhandari et al were reported as 8% (3,4). The overall incidence of sciatic nerve palsy was 23.7% in our series which is slightly higher than reported in previous literature. Avascular necrosis of femoral head is a serious complication of posterior hip

dislocations which causes earlier hip replacement. Hougaard et al. has suggested that avascular necrosis of the femoral head might occur in 58% of cases if reduction of the dislocation delay more than six hours (8). We have found avascular necrosis only in three of the cases (7.9%) although all of them were reduced after six hours.

The value of this study may be limited by its retrospective design, the lack of a control group and the relatively small number of patients. Additionally, important factors that may influence the outcome, such as bone quality and preoperative fracture displacement, were not evaluated. Studies with larger sample size with greater power might be needed to ascertain the true differences in the outcome and the other factors influencing acetabular reduction in this heterogeneous group.

In conclusion, posterior hip dislocation accompanies in one third of the acetabular fractures and this may influence the clinical and radiological outcome.

REFERENCES

1. Iselin LD, Wahl P, Studer P, et al. Associated lesions in posterior wall acetabular fractures: not a valid predictor of failure. J Orthop Traumatol 2013;14:179-84.

2. Mears DC, Velyvis JH, Chang CP. Displaced acetabular fractures managed operatively: indicators of outcome. Clin Orthop 2003:407:173–186.

3. Bhandari M, Matta J, Ferguson T, et al. Predictors of clinical and radiological outcome in patients with fractures of the acetabulum and concomitant posterior dislocation of the hip. J Bone Joint Surg Br 2006;88:1618-24.

4.Briffa N, Pearce R, Hill AM, et al. Outcomes of acetabular fracture fixation with ten years' follow-up. J Bone Joint Surg Br 2011;93:229-36.

5. Meena UK, Tripathy SK, Sen RK, et al. Predictors of postoperative outcome for acetabular fractures. Orthop Traumatol Surg Res 2013 Dec;99:929-35.

6. Yue JJ, Sontich JK, Miron SD, et al. Blood flow changes to the femoral head after acetabular fracture or dislocation in the acute injury and perioperative periods. J Orthop Trauma 2001 Mar-Apr;15:170-6.

7. Thompson VP, Epstein HC. Traumatic dislocation of the hip. A survey of two hundred and four cases covering a period of twenty-one years. J Bone Joint Surg [Am] 1951;33:746–777.

8. Hougaard K, Thomsen PB. Traumatic posterior dislocation of the hip. Prognostic factors influencing the incidence of avascular necrosis of the femoral head. Arch Orthop Trauma Surg 1986;106:32–35.

9. Judet R, Judet J, Letournel E. Fractures of the acetabulum: classification and surgical approaches for open reduction. J Bone Joint Surg Am 1964;46:1615-75.

10.Matta JM, Mehne DK, Roffi R. Fractures of the acetabulum. Early results of a prospective study. Clin Orthop Relat Res 1986;205:241-50.

11.Matta JM. Operative treatment of acetabular fractures through the ilioinguinal approach. A 10-year perspective. Clin Orthop Relat Res 1994;305:10-9.

12.Kreder HJ, Rozen N, Borkhoff CM, et al. Determinants of functional outcome after simple and complex acetabular fractures involving the posterior wall. J Bone Joint Surg Br 2006 Jun;88:776-82.