ORIGINAL ARTICLE

FUNCTIONAL OUTCOME OF SURGERY IN PATIENTS WITH ACETABULAR FRACTURES

Shaukat Hayat Khan, Iffat Ara*, Shahbaz Raza, Sarfraz Sipra*****

Department of Orthopaedics, *Radiology, AJK Medical College, **Shaikh Khalifa Bin Zaiyed Hospital, Muzaffarabad, ***Pakistan Institute of Medical Sciences, Islamabad

Background: High velocity injuries due to road traffic accidents can be managed conservatively or surgically depending whether the fracture is displaced or not. The objective of this study was to evaluate functional outcome of surgery in patients of acetabular fractures. **Methods:** It was a case series study conducted in Department of Orthopaedic Surgery, Pakistan Institute of Medical Sciences from 1st october 2007 to 15th December 2008. Thirty patients were included in the study fulfilling the inclusion criteria. Patients were followed up in the OPD and were evaluated for functional outcome by using Harris Hip Scoring System. **Results:** Total 30 patients were operated during the study period. Mean age of patients was 33.5 years. Males were 22 and females were 8. Twenty-three patients had road traffic accident as a cause of injury and 7 were due to fall. Ninety-three percent of patients were operated within 2 weeks. Most common type of fracture was both column fractures. In only one patient sciatic nerve injury was present postoperatively. Average hospital stay was 7 days. Out of 30 patients, 21 patients were classified to have good score, 4 patients were classified to have excellent score while 5 patients were having poor result. **Conclusion:** The surgical management of displaced acetabular fractures yields good results.

Keywords: Acetabular fractures, Harris hip score, judet views, Road traffic accidents, outcome

J Ayub Med Coll Abbottabad 2013;25(1-2):60–3

INTRODUCTION

Acetabular fractures occur most commonly in severe trauma. Road traffic accidents account for majority of cases. Epileptic seizures can lead to acetabular fractures due to fall. There is persistent increase in the number of motor vehicle accidents leading to injuries and morbidities. Incidence of acetabular fractures is also on rise in Pakistan. However, there are few studies till now about the clinical outcome of surgically treated acetabular fractures in pakistan.[1]

Patients with osteoporotic bones, renal failure, taking steroids, and smoking are on risk of having acetabular fractures. In these cases even less severe trauma can lead to fracture. With the passage of time, awareness regarding acetabular fractures and their management has improved. This has led to more work and efforts by orthopaedic surgeons in this field.[2,3]

Acetabular injuries are challenge for treating surgeons. They need more skills to be handled. They are more complex injuries as compared to other parts of body.[4] Traumatic hip dislocations are associated with acetabular fractures. Posterior dislocation can result in sciatic nerve damage. This should be recognised early and closed reduction should be done. After closed reduction done, definitive treatment or surgery is performed during first two weeks after injury. Even after perfect reduction of dislocation, it can lead to degenerative changes in the long term.[5]

Accurate congruity of joint after surgical treatment determines the long term clinical and radiological outcome and morbidity of patients with displaced fractures.[6] Displacement is defined as incongruence of the femoral head with the superior acetabulum out of traction on x-ray pelvis. Posterior wall fractures including more than 50% of the acetabulum, and both column fractures are considered as displaced fractures.[7]

Radiographic examination should include the anteroposterior and oblique views (Judet) of the pelvis for proper evaluation. CT scan, especially 3D CT scan gives the detail information of the fracture patterns and is very much effective for preoperative evaluation and proper surgical intervention.[8] Acetabular fractures can lead to joint temponade, which will raise intracapsular pressure compromising blood supply of the head.[9]

Acetabular defect of high velocity trauma is a troublesome clinical problem. Majority of patients need secondary surgery.[10] In patients with comminution of roof of acetabulum prognosis is poor in spite of good reconstruction.[11] Patient will experience pain in the joint in the long run. Degenerative process in the joint will affect the functional outcome. Vascular assessment is also done preoperatively for prevention of vascular accidents during hip surgery. It helps in placing acetabular implants safely.[12] All acetabular fractures were usually treated conservatively with poor results in past. This was due to lack of advanced radiology that is available today. Skills of operating surgeon was also a factor. Now displaced fractures are treated by surgical intervention and results has shown improvement in the management of these complex fractures.[7] Surgical intervention has better results compared to conservative management in displaced acetabular fractures.

The aim of operative treatment of acetabular fractures is to get anatomic reconstruction. All patients are placed in skeletal traction for immobilisation and relief of pain. Low molecular weight heparin can be started in elderly people.[13] It can also be started in high risk patients. Surgical intervention is associated with multiple complications, like infection, wound healing problems, neurovascular damage and heterotopic ossification. Heterotopic ossification is a disabling complication and can be avoided by prophylactic use of irradiations and indomethacin.[14] Acetabular surgery is a major surgery and every effort should be made to achieve proper sterilisation in operation theater. Use of proper antibiotics and dressing in aseptic environment postoperatively decreases the incidence of infection. Drain is placed in all patients postoperatively and indomethacin is started. Patients are mobilised on 2nd or 3rd day. Full weight bearing depends on fracture type and consolidation of fracture. It varies according to fracture pattern and quality of bone.[15]

The objective of this study was to evaluate functional outcome of surgery in patients of acetabular fractures.

MATERIAL AND METHODS

It was a case series study conducted in Department of Orthopaedic Surgery, Pakistan Institute of Medical Sciences, Islamabad from 1st October 2007 to 15th December 2008. Thirty patients with displaced acetabular fractures who fulfilled the following inclusion criteria were enrolled in this study. A consecutive sampling was chosen.

- The patients with displaced acetabular fractures between the age range 13 years and 50 years.
- The patients with unstable fracture dislocation of hip either anterior or posterior.
- The patients with displaced acetabular fracture who would present within three weeks period of injury
- Informed consent.

The patients who had any of the following exclusion criteria were not enrolled:

- Patients with associated life threatening injuries.
- Open acetabular fractures.
- Those patients with ipsilateral femoral shaft fracture.
- Patients not fit for general anesthesia
- Patients with associated pelvic factures.
- Patients with preoperative sciatic nerve injury.
- Patients who did not give informed consent.

Demographic indicators, i.e., age, gender, history of present illness, and time since injury were recorded. Moreover, on examination the type of acetabular fracture was classified by using Letournel and Judet classification with the help of radiographs and computer tomography scans and hence type of surgical approach was selected. All these patients were then admitted and operated by a single surgeon. All these patients were placed on skeletal traction pre operatively. Anterior ilioinguinal approach was used for anterior wall and column fractures. Kocher Langenbeck approach was used for posterior wall and column fractures. Stable fixation of fractures was attained with reconstruction plates, while where possible, compression was achieved with cancellous screws. All enrolled patients were followed up after their discharge at regular intervals initially after two weeks and later at 4 week intervals till 6 months postoperatively. At each follow up visit, every enrolled patient was examined and assessed for functional outcome regarding hip function based upon Harris Hip Score and the relevant information was recorded. Harris Scoring System takes into account 4 parameters. These are pain, function, which is further broken down into gait, use of supports and activities, range of movements and absence of deformity. Pain is allocated 44 points, function 47 points, range of movements 5 points and absence of deformity 4 points. Score of a normal hip according to this System is 100. Scores above 90 are regarded as 'excellent', between 70–89 as 'good' and below 70 as 'poor'. In all the enrolled patients, a separate assessor did the scoring. All this information was documented on a specially designed Proforma.

Data were analysed using SPSS-15. Mean Harris Hip Score were compared on all visits by using dependent Student's *t*-test. Moreover, the comparison of Harris Hip Scores classification, poor, good and excellent, on all visits were also carried out by using Chi-square test and $p \leq 0.05$ was taken as significant.

RESULTS

During the study period 30 patients were enroled. Mean age of patients was 33.5 years. Male patients were 22 while 8 were females. Twenty-three patients had road traffic accident as a cause of injury and 7 were due to fall. Ninety-three percent of patients were operated within 2 weeks. Most common type of fracture was both column fractures. In one patient sciatic nerve injury was present postoperatively. Average hospital stay was 7 days. The mean of Harris hip score improved, from 15.7±2.8 at 1st visit after two weeks postoperatively, to 77.2±8.8 at last visit after 6 month postoperatively (p=0.001).

The Harris Hip Score improved at each visit after surgery. At second visit, the mean score improved by 12.8 (15.7 at first visit and 28.5 at second visit) while at 3rd visit the score increased by 11.9 (28.5 at 2nd visit and 40.4 at 3rd visit). At 4th visit, the score further increased by 10.6 (40.4 at 3rd visit and 51.0 at 4th visit). Further increase of Harris Hip Score of 11.6 was observed on 5th visit (51.0 at 4th visit and 62.6 at 5th visit). On last visit, mean increase of 14.6 score was observed (62.6 at 5th visit and 77.2 at last visit). Out of

30 patients, 21 patients had good score, 4 patients had excellent, and 5 patients had poor results. Seven (23%) patients did not acheive anatomical reduction while 23 (77%) patients achieved the anatomical reduction.

Table-1: Comparison of Harris Hip Score at each visit among all enrolled patients (n=30)

Visits	Harris hip score classification			*p*
	Poor	Good	Excellent	
	n (%)	n (%)	n (%)	
First visit	30 (100)	0 (0.0%)	0 (0.0%)	1.0
Second visit	30 (100)	0 (0.0%)	0 (0.0%)	1.0
Third visit	30 (100)	0 (0.0%)	0 (0.0%)	1.0
Fourth visit	30 (100)	0 (0.0%)	0 (0.0%)	1.0
Fifth visit	27 (90.0%)	3 (10.0%)	0 (0.0%)	0.07
Last visit	5 (16.7%)	21 (70.0%)	4 (13.3%)	0.001

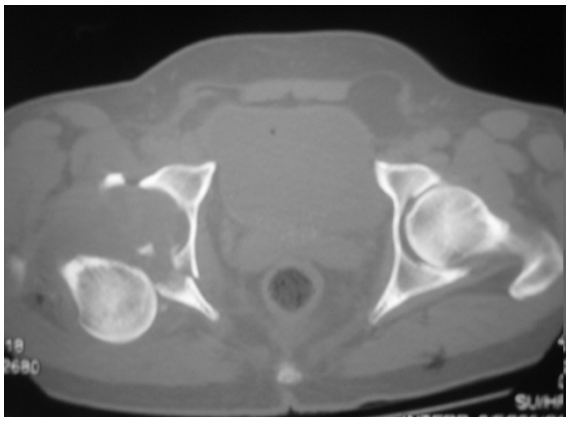

Figure-1: CT scan Showing Posterior Fracture Dislocation Right Hip Joint

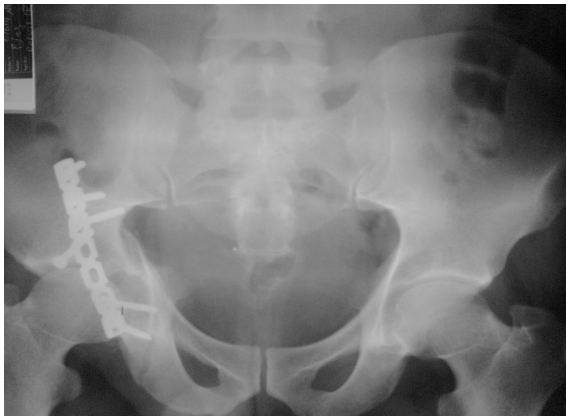

Figure-2: Post-op X-Ray pelvis showing reconstruction plate

DISCUSSION

Acetabular fractures occur frequently and are most common in road traffic accidents.[6] Road traffic accidents are increasing day by day due to multiple reasons. Ignorance of traffic principles, poor traffic system and deficiency of roads all are adding insult to the incidence of this dilemma.[2] Thirty patients were included in study. The mean age in our study was 33.5 years while it was 36.8 years in another study conducted by Rao *et al*[6]. It reflects that the age group of patients suffering from acetabular fractures belongs to younger age group. Male preponderance was more in our study as it was in the study conducted by Rao *et al*.[6] This shows the attitude of male travelling more in our society.

Patients suffering from acetabular fractures are either due to road traffic accident or fall. In our study the majority of the patients were suffering from road traffic accidents.

In displaced acetabular fractures surgical intervention should be done as early as possible. By doing this we can get good results. We operated most of the cases within 2 weeks time and it resulted in good outcome, as is evident from another study conducted by Gupta *et al*[16] which also showed good results when surgery was done within 2 weeks time. Majority of people in our study came within 2 weeks time due to only tertiary care hospital in a wide population area.

Acetabular fractures are most often associated with multiple injuries and hence in majority of cases both column fractures were present in our study. In 25 patients we used Kocher langenbeck approach and it was associated with good results. Gupta *et al*[16] used it in 47% patients. We got congruent reduction in 77% of the patients while it was 76.91 in Gupta *et al*[16]. The rate of infection in Gupta *et al*[16] was 7.9% while no case of infection was found in our study. Three percent of patients developed sciatic nerve injury in our study while it was 3.17% in Gupta *et al*[16]. In another study conducted by Rommens *et al*[17], it was 8.3%. Proper sterilisation technique lead to no infection in our study. We did not come across heterotopic ossification in any patient in our study. None of the patient developed DVT. We used Harris hip scoring in evaluation of functional outcome. It improved with each visit. In our study patient's compliance was excellent. Seventy percent of patients had good score, while it was excellent in 13% of patients compared to another study in which result was good in 69.5%. We did not use DVT prophylaxis in any of the patients in our study and no case of DVT was reported. We mobilised the patients early with partial weight bearing. Theatre sterilisation was taken care of, and pre- and postoperative antibiotics were administered.

CONCLUSION

The effective method for the management of displaced acetabular fractures is operative treatment. All the patients should be operated with in two weeks to get good results. Clinical and radiological results correlate closely with an anatomic reduction. Complication rate can be reduced if adequate preoperative assessment and planning is performed. Adequate sterilisation technique is also a factor leading to good surgical outcome by reducing rate of

infection. Kocher Langenbeck approach for posterior wall, posterior column and both columns fracture leads to good outcome.

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Address for Correspondence:

Dr. Shaukat Hayat Khan, Department of Orthopaedic/Radiology, Pakitan Institute of Medical Sciences Islamabad

Email: drazmat772@gmail.com