ORIGINAL RESEARCH

Long Term Results of Delayed Fixation of Displaced Femoral Neck Fractures in Young Adults.

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ABSTRACT

Introduction: Femoral neck fractures are among the most debatable topics round the globe. The reason being the precarious blood supply of the femoral head which leads to non-union and avascular necrosis. However the delay in presentation or surgery owing to the non-availability of specialised trauma centres or delayed referral in the developing world is expected to affect the outcome in terms of non-union and AVN. The aim of this study is to present the longer follow up of patients who were treated with internal fixation for displaced femoral neck fractures.

Material and Methods: 120 patients who had displaced fracture neck of femur during the interval of 2001-2007. Mean age group of patients was 40 years (range 20-57). 67% (N=80) were males and 33% (N=40) were females. Patients were referred to our institute from various district hospitals within 2-5 days of trauma or had gone to bone setters or quacks for the same, causing delay of up to 7 days.

Results: Final follow up was possible in 120 patients.10 patients had non-union (clinical and radiological) while as 35 patients developed avascular necrosis during the follow up time. For the first four years, only 12 cases had avascular necrosis out of which 4 were advised total hip arthroplasty. Subsequently the other 23 patients developed stage 4 disease and were managed with THA or otherwise.

Conclusion: Displaced Femoral neck fractures in young adults should be internally fixed and primary replacements should be reserved for elderly populations. Patients should be followed up regularly to look for AVN in such hips. Satisfactory results are achieved even when the displaced neck is internally fixed in delayed presentations.

Keywords: Fracture neck of femur, Gardens classification, Delayed fixation for fracture NOF.

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INTRODUCTION

Femoral neck fractures are among the most debatable topics round the globe. The reason being the precarious blood supply of the femoral head which leads to non-union and avascular necrosis.[1-5] The recent advances in the hip arthoplasty has solved many problems but the younger age group is still in focus as early reduction and internal fixation is considered to be the standard option.[6-7] However the delay in presentation or surgery owing to the non-availability of specialised trauma centres or delayed referral in the developing world is expected to affect the outcome in terms of non-union and AVN. The aim of this study is to present the longer follow up of patients who were treated with internal fixation for displaced femoral neck fractures and to look for AVN, non-union or any other complications thereof. In 2008 we presented Fifty five cases and then followed them over the period of minimum seven years.[8]

MATERIAL AND METHODS

A prospective study was carried out on 120 patients who had displaced fracture neck of femur during the interval of 2001-2007. Mean age group of patients was 40 years (range 20-57). 67% (N=80) were males and 33% (N=40) were females. Patients were referred to our institute from various district hospitals within 2-5 days of trauma or had gone to bone setters or quacks for the same, causing delay of up to 7 days. Left side was involved in 73 patients and Right in 47 patients. Cause of trauma was fall from height in 70% patients and RTA in 28% patients.All fractures were classified using Gardens system into Type III and Type IV. There were 70 patients in the first group and 50 in the latter group. Associated injury was found in 32 patients The patients were operated at the mean of 6 days after the trauma episode under spinal anaesthesia or epidural anaesthesia. Whitman's method was

Total number of patients	**120**	
Male: Female Ratio	80/40	2:1
Age	40 years	{range 20-57}
Side involvement	Right =45Left=75	Ratio 1:1.67
Mode of injury	Fall from heightRoad traffic accident Others	80355
Injury Admission interval (mean)	3 days	{range 0-7days}
Injury surgery interval	6 days	{range 2-9}
Associated injuries	32 cases	

Table-1: Patient Data

Judet point scoring for grading disability					
Pain		Range of motion		Ability to walk	
Observation	Grade	Observation	Grade	Observation	Grade
Severe pain at restSevere pain on walkingPain tolerablePain with fatigueSlight painNo pain	123456	0(limb in poor position)0(limb in good position)0-7070-140140-200200-300	1 bedridden23456	1Walking very limited with/ without caneWalking limited with a caneLong distance with a caneNo cane but limpnormal	23456

Table-2A: Judet's point system for grading disability.

Judet terminology for rating	
Summation of judet points	Rating
8 or less9-1112-1516 or more	Bad Fair Good Excellent

Table-2b: Judet's terminology for ratings

Results	
Patients available for final assessment	120
Patients lost during follow up	15
Follow up (mean	10 years(range 7-14)
Final results(no. of patients)	Excellent 70 Good 17 Fair 10 Bad 23
Complications	Superficial wound infection 13Non-union 10Avascular necrosis 35

Table-3: Results

used for reduction under image intensifier by one of the authors. The acceptable reduction (i.e. <2.5mm displacement; AP $\leq 5^{o}$_varus to $\leq 25^{o}$ valgus and lateral 10^{o} - 20 from anatomic as described by Lindquist was set as the goal. Fixation was done with three 6.5mm/7mm AO or ASIS cannulated screws placed in an inverted triangle pattern. Washers were used as per the surgeon's choice.The IV antibiotics were given for one day and the standard rehabilitation protocol was followed i.e., encouraging patients to sit on first postop. Day and touch down weight bearing at 2 weeks with walker and partial weight bearing at 6 weeks. Patients were allowed full weight bearing at clinical and radiological union.Non-union and avascular necrosis were the main complications seen and looked for during first 6 months. Failure of fixation with implant breakage, loss of reduction or persistent fracture line at 6 months were the signs of non-union. Avascular necrosis was classified radiologically as per Ficat and Arlet Classification system.

RESULTS

135 patients were initially treated with this method and 15 were lost to follow up. Final follow up was possible in 120 patients.10 patients had non-union (clinical and radiological) while as 35 patients developed avascular necrosis during the follow up time.All 10 non-union patients were managed as per the merit (age and time) while as 35 patients who developed avascular necrosis were further treated as per the symptoms. For the first four years the avascular necrosis had only 12 cases out of which 4 were advised total hip arthroplasty. Subsequently the other 23 patients developed stage 4 disease and were managed with THA.The mean pain grade at final follow up was 4.9(range 4-6) and only 5% patients needed analgesics for pain relief. All but 10 patients returned to pre injury job and few had to modify their activities. As per Judet's point system [table 2a and 2b] 87 patients achieved good to excellent results.

DISCUSSION

The bone quality and the healing potential in young patients makes the fracture neck of femur still the debatable topic. In the era of arthroplasty, the delayed fixation of displaced femoral neck fractures may not have many takers around the globe. But the wear of arthroplasty components and life of implant makes the surgeon think twice, before offering the THA to the patient.Internal fixation of fracture neck of femur (even if delayed) has a high rate of fracture union as is demonstrated in various studies.[8-10] The delay in the presentation in the developing world is mainly due to delayed referral or the mismanagement by quacks as depicted in the literature from the rest of the world.[11]

Further lack of trauma support and administrative issues may cause delay in fracture management owing to huge rush of

patients at government hospitals with limited resources. So the study of this type was inevitable from the orthopaedic hospital catering a population of 5 million in a hilly region. The scoring system used was the Judet system as it is simple and has been used by other authors.[12] The final scoring was done at minimum 7 years and the complications like non-union and AVN were noted.[13] The non-union noted by our team during the follow up is 10% and is comparable to other studies. Surgical error was the most important factor in 7 cases followed by patient compliance (n=5). Similar observation was made by Upaday et at.[14] Delay in the fixation as noted by other studies was important factor for non-union was not noted in our study as all fractures were fixed at an average 6 days after injury. Bray and Zeterbay have suggested less than 6 hrs as critical time for surgery (golden hour) but even delayed fixation has yielded good results in our study.[15] AVN is reported to be 16% -27%.[16] Among Several factors, time of reduction was only factor for AVN. Patient age, fracture displacement and type of fixation was not significant. Maninger et al reported 20% AVN in 27 cases in fractures fixed within 6 hrs.[17] The detailed description of final assessment is given in table 3.

CONCLUSION

Displaced Femoral neck fractures in young adults should be internally fixed and primary replacements should be reserved for elderly populations. Patients should be followed up regularly to look for AVN in such hips. Satisfactory results are achieved even when the displaced neck is internally fixed in delayed presentations.

REFERENCES

1. Lu-Yao GL, Keller RB, Littenberg B, Wennber JE. Outcomes after displaced fractures of the femoral neck. A meta-analysis of one hundred and six published reports. J Bone Joint Surg Am.1994;76:15–25.
2. Davidovitch RI, Jordan CJ, Egol KA, Vrahas MS. Challenges in the treatment of femoral neck fractures in the nonelderly adult. J Trauma. 2010; 68:236–242.
3. Miyamoto RG, Kaplan KM, Levine BR, Egol KA, Zuckerman JD. Surgical management of hip fractures: An evidenced-based review of the literature. I: Femoral neck fractures. J Am AcadOrthop Surg. 2008;16:596–607.
4. Hasenboehler EA, Agudelo JF, Morgan SJ, Smith WR, Hak DJ, Stahel PFl. Treatment of complex proximal femoral fractures with the proximal femur locking compression plate. Orthopaedics.2007; 30:618–623.
5. Pervez H, Parker MJ, Vowler S. Prediction of fixation failure after sliding hip screw fixation. Injury.2004; 35:994–998.
6. Haidukewych G, Rothwell WS, Jacofsky DJ, Yotchia ME, Berry DJ. Operative treatment of femoral neck fractures in patients between the ages of fifteen and fifty years. J Bone Joint Surg Am.2004; 86:1711–1716.
7. Roshan A, Ram S. Early return to function in young adults with neglected femoral neck fractures.Clin Orthop Relat Res. 2006; 447:152–157.
8. Butt MF, Dhar SA, Gani N, Farooq M, Mir MR, Halwal MA. Delayed fixation of displaced femoral neck fractures in younger adults. Injury Int J Care. Injured. 2008; 39:238–243.
9. Arnoldi CC, Lemperg RK. Fractures of the femoral neck–-II.Relative importance of primary vascular damage and surgicalProcedure for the development of necrosis of the femoralHead. Clan Orthop 1977; 129:217-22.
10. Bray TJ, Smith-Hoefer E, Hooper A, Timmerman L. Thedisplaced femoral neck fractures: internal fixation versusBipolar endoprosthesis: results of a prospective, randomizedComparison. Clin Orthop 1988;230:127-40.
11. Jain R, Koo M, Kreder HJ, et al. Comparison of early & delayedFixation of subcapital hip fractures in patients sixty years ofAge or less. J Bone Joint Surg 2002; 84A:1605-12.
12. Stinchfield, Frank E, Cooperman B, Shea CE. Replacement ofThe femoral head by Judet or Austin Moore prosthesis. J BoneJoint Surg 1957; 39A:1043-58.
13. Ficat RP. Idiopathic bone necrosis of the femoral head. Early diagnosis and treatment. J Bone Joint Surg 1985; 67B:3-9.
14. Upadhyay A, Jain P, Mishra P, et al. Delayed internal fixationof fractures of the neck of the femur in young adults: aProspective, randomized study comparing closed and openReduction. J Bone Joint Surg 2004;86B:1035-40.
15. Zetterberg CH, Islam L, Andersson GB. Femoral neck-Fractures in young adults. Acta Orthop Scand 1982; 53:427-35
16. Parker MJ, Pryor GA. The timing of surgery for proximalfemoral fractures. J Bone Joint Surg 1992; 74B:203-5.
17. Manninger J, Kazar G, Fekete G, et al. Significance of urgent(Within 6 hrs) internal fixation in the management of fracturesOf the neck of the femur. Injury 1989; 2:101-5.