Observations on AVN Development in Patients of Fracture Neck of Femur Treated with Delayed Fixation

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ABSTRACT

Introduction: Incidence of displaced fracture neck of femur is high and there is lack of consensus over the definitive treatment of such fractures as the incidence of complications especially avascular necrosis remains very high. Objective of the study was to evaluate the incidence of avascular necrosis and its pattern in displaced fracture neck of femur managed with osteosynthesis

Material and methods: This study was a prospective study conducted in Bone & Joint Hospital, Srinagar from 2003 to 2018 on patients with displaced fracture neck of femur. Close reduction was done on traction table using Whitman’s Method and reduction was confirmed under C Arm and was labelled satisfactory using Lowell’s S Method and fixation was done using 3 Cannulated Screws of 6.5mm.

Results: 118 patients [70 males and 48 females] with mean age 42.5 years [range 18 to 55 years] were included in the study. A VN was developed in 30 patients – 27 males and 3 females. A VN was confirmed under C Arm and fixation was done using 3 Cannulated Screws of 6.5mm. The screws were placed through a lateral approach in an inverted triangle configuration. The patients were followed with static quadriceps exercises and discharged after one day and advised toe touch weight bearing and physiotherapy as pain allowed. The patients were followed till 2018 and A VN was observed in 30% of patients.

Conclusion: Our study suggest same AVN rates as of other studies if fixation is done within a period of one week.

Keywords: Fracture Neck of Femur, Avascular Necrosis, Nonunion

INTRODUCTION

Hip Fracture is a major public health issue and major economic burden on health care worldwide. Femoral Neck Fractures constitute approximately half of all hip fractures and 70 to 75% of these are displaced (Gardens III and IV). In younger patient’s fracture of hip do occur as a result of high energy trauma. As a result of complex anatomy and precarious vascular supply fracture neck of femur constitute a challenge to health care provider especially in young high demand patients in which preservation of native head remains the priority. Although complications of internal fixation increase the risk of additional surgery but once union has been achieved the long term results of the procedure are excellent.

AVN of Femoral Head and Non Union are the two major complications in the treatment of displaced femoral neck fracture. AVN may develop in 30 to 35% of patients in this procedure. AVN may lead to collapse of femoral head and subsequent Osteoarthritis of hip joint. AVN may require additional surgery such as Osteotomy and Bone Grafting or Arthroplasty. Non Union and fixation failure are early post-operative complications with a prevalence reported to range from 10 to 30%. The purpose of this study was to evaluate the incidence of development of AVN and its pattern in displaced Femoral Neck Fractures treated with delayed fixation.

MATERIAL AND METHODS

This was a prospective study conducted in Bone and Joint Hospital from 2003 to 2018.

Inclusion Criteria

Displaced Fracture Neck of Femur.

Age range of 18 to 55 years.

Patients operated from 24 hours to 7 days post trauma.

Exclusion Criteria

Undisplaced fractures.

Age <18 and >55.

Patients operated in less then 24 hours and after 7 days post trauma.

Patients who required open reduction.

The patients were operated under spinal or General Anesthesia on the preference of Anesthetist and pre op antibiotics were given one hour before surgery. Close reduction was done on traction table using Whitman’s Method and reduction was confirmed under C Arm and was labelled satisfactory using Lowell’s S Method and fixation was done using 3 Cannulated Screws of 6.5mm. The screws were placed through a lateral approach in an inverted triangle configuration. The patients were followed with static Quadriceps Exercises and discharged after one day and advised Toe Touch weight bearing and physiotherapy as pain allowed. The patients were followed till 2018 and AVN was defined as those showing Ficat Arlet Stages III and IV.

RESULTS

Mean age of patients was 42.5 years (range of 18 to 55 years). 70 were male (59.32%) and 48 females (40.67%). Mode of injury was high energy trauma. A VN was observed in 30% of patients.

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trauma included RTA in 65 patients (55.08%) and fall from height in 30 patients (25.42%) and trivial trauma in 23 patients (19.49%). Average time from injury to surgery was 4.5 days. All patients were displaced gardens stage III and IV. All patients under went close reduction and internal fixation with Cannulated Screws. Non Union was encountered in 32 patients (27.11%). AVN developed in 25 patients (21.18%). Of these 9 patients developed AVN within two years and 7 in 3rd year, 5 in 4th year and 4 developed delayed AVN .1 in 5th year, 2 in 6th year and 1 in 8th year. Thereafter no patient developed AVN. Out of these 12 were converted to Total Hip Replacement and rest are managing their symptoms with occasional analgesics.

DISCUSSION

Operative management of displaced intracapsular fractures has stimulated a debate for decades. Studies suggest that patients with age < 60 years with displaced fractures should be internally fixed and in age > 80 years are in favor of Arthroplasty.11 Though there is variation in treatment in patients between 60 to 80 years versus Arthroplasty or Internal Fixation. Studies suggest that younger patients develop AVN more than Non Union and elder more Non Union than AVN.12,13,14 There is strong evidence that the incidence of AVN is higher in displaced compared to undisplaced Intracapsular Hip Fractures.3,11,14,15 In our study AVN developed in 21% of patients. This is consistent with other studies such as Swiontkowski Et al16 with an incidence of AVN of 20%. Studies by Zetterberg Et al17 had AVN rate of 41%. Reason for such a high rate could be that among these patients with AVN 17 were alcohol abusers and in our study no patient was alcohol abuser. Brey18 was of the opinion that early rigid will lead to better outcome. Karaeminogullari O Etal19 had rate of AVN in those operated within 12 hours and those operated after 12 hours of 25% and 27% respectively. Though studies suggest that there is no discrepancy in AVN or Non Union in patients operated even after 48 hours. Our study suggest same AVN rates as of other studies and suggest no effect of timing of surgery if patient is operated within 7 days. The pattern of AVN development is also consistent with other studies. Though these studies did not suggest the time of AVN. In our study 9 patients developed AVN within two years and 7 in 3rd year, 5 in 4th year, 1 in 5th year, 2 in 6th year and 1 in 8th year.

CONCLUSION

Our study suggests same rate of AVN in delayed fixation of fracture neck of femur as is seen in early fixation. Some patients may develop AVN even after 4 years post osteosynthesis.

REFERENCE