Original Research Article

Outcome study of proximal femur fracture in patients having cardiac diseases

Khushwinder Singh[1],*, **Pankaj Mahindra**[1], **Rajnish Garg**[1]

[1]*Dept. of Othopaedic, Baba Farid University of Health Science, Faridkot, Punjab, India*

A B S T R A C T

Background: To assess the outcome of fracture in patients with cardiac diseases, evaluate delay in surgery & study the quality of life post hospital discharge.

Materials and Methods: A prospective review of the medical records of 32 cases who underwent surgery at Dayanand Medical college & Hospital, Ludhiana was performed. Patients were selected with proximal femur fracture having cardiac diseases after fulfilling the inclusion and exclusion criteria. After taking detailed history and examination, the patients were followed up after 4-6 weeks and 3-4 months. A detailed structured performa was filled and functional assessment was done using HHS.

Results: We had final follow up of all 32 patients which were included in the study managed by PFN. Modified HHS was accessed at 4-6 weeks and 3-4 months and found to be 41.19 (SD =12.89) & 64.66 (SD =13.35) respectively. No mortality was observed during the follow up. Presence of cardiac comorbidities increased the chances of hip fracture and poor HHS was observed among the patients in the study. Although no significant difference on HHS was observed among the subtypes of cardiac diseases. Most common cause of delay in surgery was the use of antiplatelet agents and delay in surgery affected the HHS significantly in a way that more the delay, poor was the HHS. Presence of comorbidities like hypertension, diabetes mellitus decreased the mean HHS. Occurrence of complications also affected the HHS. More the complications, poor was the HHS.

Conclusion: Patients with hip fracture with a diagnosis of CVD, have greater risk of hip fracture with longer length of hospital stay and hence higher cost per hospital stay. Presence of more comorbidities along with CVD shows a significant association in the functional outcome.

1. Introduction

Proximal femur fractures correspond to a large percentage of hospitalisations due to orthopaaedic conditions, and are associated with high morbidity and mortality rates. It is estimated that the number of cases can reach up to 6.26 million by 2050, mostly because of the population pyramid inversion worldwide. The affected patients are usually older than 70 years of age, Caucasian and postmenopausal females. The most common mechanism is low-energy trauma, and it is related to clinical conditions such as malnutrition, decreased visual acuity and reflexes, chronic use of medications, and, most importantly, the progressive decrease in bone mineral density. [1]

One of the most commonly occurring bone injuries among the elderly is the intertrochantric fracture of the femur. [2] Ageing is an undefinable process and as the population ages, the incidence of hip fracture is anticipated to increase exponentially. Prolonged bed rest further worsens the morbidity and mortality after a hip fracture. Thus the early restoration of the patients to their pre-injury status is imperative and this entailed internal fixation should be accepted as the standard of management as it provides

* Corresponding author.
E-mail address: dockhushwinder@gmail.com (K. Singh).

acceptable reduction and facilitates early mobilization.[3]

2. Materials and Methods

The study was conducted at the Department of Orthopaedics, Dayanand Medical College, and Hospital, Ludhiana.

2.1. Study population

The purpose of our study was to review and analyse the functional outcome of proximal femur fracture in patients having cardiac diseases. A prospective review of the medical records of 32 cases who underwent surgery at Dayanand Medical college & Hospital, Ludhiana was performed. Patients were selected with proximal femur fracture having cardiac diseases managed with PFN after fulfilling the inclusion and exclusion criteria. After taking detailed history and examination, the patients were followed up after 4-6 weeks and 3-4 months. A detailed structured performa was filled and functional assessment was done using HHS (Harris hip score).

2.2. Inclusion criteria

1. Patients with proximal femur fracture managed by PFN.
2. Patients having cardiac diseases.
3. Patients who gave informed consent and willing for follow up.

2.3. Exclusion criteria

1. Pregnant patients
2. Open fractures
3. Patients managed with hip replacement
4. Patients without any cardiac diseases

2.4. Sample size

The study included 32 cases with proximal femur fracture having cardiac diseases\ who consented to participate in the study.

2.5. Sampling technique

Patients who were admitted for proximal femur fracture having cardiac diseases at the Department of Orthopaedics, Dayanand Medical College & hospital, Ludhiana were selected after applying the relevant inclusion and exclusion criteria.

2.6. Study duration

The study was conducted over a period of 2 years and followed up at 4-6 weeks and 3-4 months.

2.7. Methodology

Data of patients who satisfied the eligibility criteria were included in the study. A written informed consent was taken from the patients. The ethical clearance certificate was taken from the ethical committee of the institute. The complete demographic, personal, clinical history and cardiac history was taken in detail. History of co-morbidities such as hypertension, diabetes was determined. The preliminary history, examination details and functional outcome was assessed using Harris Hip score.

2.8. Outcome

Final outcome was assessed at 4-6 weeks and 3-4 months follow up using modified Harris Hip score.

2.9. Statistical analysis

Data was described in terms of range; mean, standard deviation (SD), frequencies (number of cases) and relative frequencies (percentages) as appropriate. All statistical calculations was done using SPSS (Statistical Package for the Social Science) SPSS 21 version statistical program for Microsoft Windows.

3. Results

In our study, majority of the subjects (50%) belonged to age group between 70-80 years. The minimum age of the subject is 40 years and the maximum age is 87 years with the mean age of the subjects is 71 years (Figure 1). The study represents majority of female subjects with approx. 65.6% and 34.4% of male subjects. Trivial fall attributes to the most common cause of mode of injury in our study. Most of the patients 62.5% were found in Type-III Boyd & Griffin Classification for intertrochanteric fractures. In our study, the minimum HHS was 40 (poor) and the maximum HHS was 87 (good). HHS at 4-6 weeks was found to be poor among all the subjects. At 3-4 months follow up, 50% of the subjects had poor HHS. In 34.4% of the subjects, HHS was fair whereas in 15.6% of the subjects, HHS was good at 3-4 months. The mean HHS at 4-6 weeks & 3-4 months is 41.19 & 64.66, respectively.(Figure 2)

Figure 1 shows the distribution of age of study subjects. In the present study, majority of the subjects (50%) belonged to age group between 70-80 years. 34.4% of the patients belonged to age group of <70 years and 15.6% of the subjects belonged to >80 years of age.

Figure 2 shows that in the study, it was found that the mean HHS at 4-6 weeks was 41.19 (SD=12.89) and at 3-4 months was found to be 64.66(SD=13.35) and the observed p value found to be 0.0001 which is a significant value.

The study found that at 3-4 months, mean HHS was found to be 75.50 (SD=8.63) in subjects with no delay in surgery. With delay of 1-3 days, the mean HHS was found
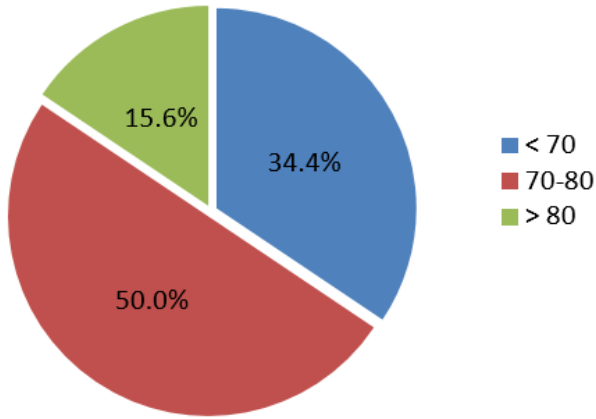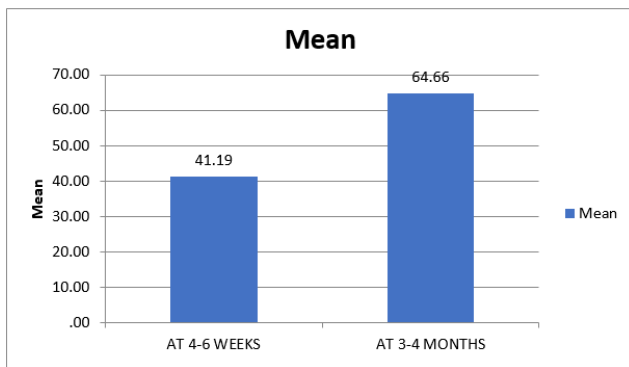
Fig. 1: Distribution of age of study subjects

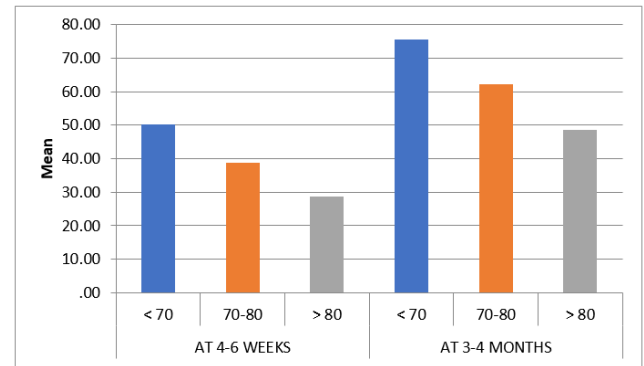**Fig. 2:** Distribution of HHS among the subjects at 4-6 weeks and 3-4 months

to be 66.20 (SD=8.33). However, after the delay of 4-6 days, the mean HHS was found to be 54.33(SD=12.61). Thus, the study implies that more the delay in surgery, poor is the HHS.
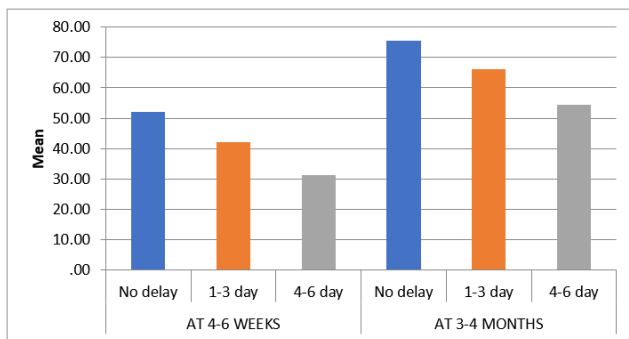
Fig. 3: Relationship between HHS and delay in surgery among the subjects at 4-6 weeks and 3-4 months

Figure 3 depicts that mean HHS found in subjects with no delay in surgery was 52.20 (SD=10.05). With delay of 1-3 days, the mean HHS decreased to 42.20 (SD=and 8.65). However, with further delay of 4-6 days, the mean HHS was found to be 31.17(SD=10.17) at 4-6 weeks. At 3-4 months, mean HHS was found to be 75.50 (SD=8.63) in subjects with no delay in surgery. With delay of 1-3 days, the mean HHS was found to be 66.20 (SD=8.33). However, after the delay of 4-6 days, the mean HHS was found to be 54.33 (SD=12.61). Thus, the study implies that more the delay in surgery, poor is the HHS.

The study observed that the mean HHS found in patients with age group <70 years was 50.27 (SD=10.479) and those with age group between 70-80 years, the mean HHS was found to be 38.88 (SD=9.99) and with the age group >80 years, mean HHS was found to be 28.60 (SD=13.849) which shows the decreasing trend in HHS with increasing age group. And the observed p value was found to be significant.(p value=0.001).(Figure 4)

Fig. 4: Relationship between HHS and age among the subjects at 4-6 weeks and 3-4 months
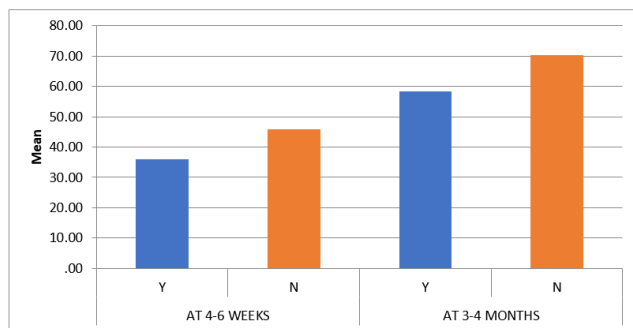
Figure 4 correlates the relationship between HHS and age among the subjects at 4-6 weeks. It was found that mean HHS found in patients with age group <70 years was 50.27 (SD=10.479) and those with age group between 70-80 years, the mean HHS was found to be 38.88 (SD= 9.99) and with the age group >80 years, mean HHS was found to be 28.60 (SD=13.849) which shows the decreasing trend in HHS with increasing age group. And the observed p value was found to be significant.(p value=0.002). Similarly, at 3-4 months, the mean HHS in patients of age group <70 years was found to be 75.64(SD= 8.10), 62.13 (SD=9.18) in 70-80 years age & 48.60(14.87) in >80 years of age. And the p value was found to be significant (p value=0.001).

Figure 5 in our study, it was depicted that mean HHS found in patients having LV dysfunction was 42.76 (SD=13.87) (max.) and minimum mean HHS found in patients having an old MI =31.0 (SD=9.0). At 3-4 months, mean HHS was found to be max. in patients with H/O CABG that is 68 (SD=8.88) and found to be minimum in patients having an old MI that is 55.67 (SD=10.50).
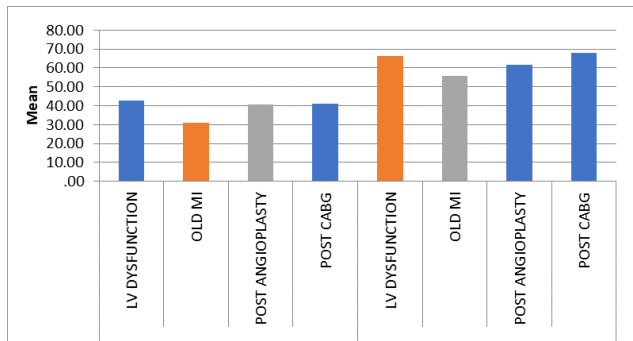
Fig. 5: Relationship between HHS & IHD among the subjects at 4-6 weeks & 3-4 months

The study found that mean HHS was higher in patients with no immediate post op complications than those with complications on follow up at 4-6 weeks & 3-4 months. The p value was found to be significant (P=0.001). Similar results were obtained in mean HHS in patients with perioperative complications. (Figure 6)

Fig. 6: Relationship between HHS and perioperative complications among the subjects at 4-6 weeks & 3-4 months

Figure 6 correlates the relationship between HHS and perioperative complications at 4-6 weeks. It was found that mean HHS found in patients with perioperative complications was 36.00 (SD=10.63) and those without any complications, the mean was found to be 45.76 (SD=13.25). And the observed p value was found to be significant. (p value = 0.020). Similarly at 3-4 months, the mean HHS found in patients with and without post-op complications was found to be 58.20 SD= 9.49) & 70.35 (SD=13.89), respectively. And the observed p value was found to be significant.(p value=0.024)

4. Discussion

In our study, we found that majority of the subjects (50%) belonged to age group between 70-80 years. As per the study by Santosh L Munde[4] the average age of the patients was 77.10 years.

The high incidence of intertrochanteric fracture in elderly population reflects high incidence of osteoporosis in these patients. 70% of the patients were in the age group of 70-80 years and 30% patients were in the age group of above 80 years. Our study represents majority of female subjects with approx. 65.6% and 34.4% of male subjects. Parsurampuriya VK et al.[5] found that the ratio of women: men range from 2:1 to 8:1 likely because of post-menopausal osteoporosis.

A study by Koh et al.[6] revealed that hip fracture rates from 1991 to 1998 (per 100 000)were 152 in men and 402 in women; this was respectively 1.5 and 5 times higher than corresponding rates in 1960s. Examined by ethnicity, since 1960, the main increase in hip fracture rates has been seen in Chinese and Malays, while the rates in the Indian ethnic group appear to have decreased. The factors responsible for these racial differences include differences in the demographic profile, body weight, physical activity, prevalence of cigarette smoking and alcohol consumption, calcium intake, and frequency of falls in the community in elderly. Trivial fall attributes to the most common cause of mode of injury in our study. This may be attributed to the fact that the coordination and reaction abilities of the elderly also continue to decline with the increase of age. In this process, the muscle strength and the response of muscles around the hip joint are reduced, which is unable to effectively offset the harmful stress. Similar findings were observed in a study by Rathore et al[7] where the major cause of injury was fall (87.5%) which comprised primarily of the people from 60-80 years of age and only in 12.5% it was due to road traffic accident.

In our study, the mean HHS at 4-6 weeks is 41.19 (SD 12.89). At 3-4 months, the mean HHS at 3-4 months is 64.66 (SD 13.35). In a study by Shakeel et al.,[8] an inter group comparison of HHS between PFN67 and DHS group revealed post-operatively after 3 month the Harris hip score in PFN group had mean value 57.33 (SD 2.10), while the HH score in DHS group had mean 51.90 (SD 0.96.). Thus, our study had the similar findings of poor HHS as that of Shakeel at 3 months period. Similar findings were obtained in a study conducted by Ranjeetesh et al.[9] In study by Rathore et al,[7] patients were evaluated according to HHS at varying intervals throughout the recovery period and final scoring was done at minimum one year follow up. There were maximum patients in excellent to good results range (73% patients). 18% patients had a fair outcome, 7.7% had poor and 2% patients had very poor outcome.

In a study by Klestil T et al.,[10] it was observed that in elderly patients sustaining hip fracture, early surgery is associated with reduced mortality and perioperative complications. Patients operated within 48 hours had a 20% lower 1-year mortality. Simunovic et al.[11] showed that early surgery (within 24 to 72 hours) can reduce the risk of all-cause mortality in patients aged 60 or older by 19% (risk ratio (RR) 0.81, 95% confidence interval (CI)

0.68–0.96)32. Early surgery was also associated with a reduction of pressure ulcers and postoperative pneumonia (RR 0.48, 95%

CI 0.34-0.69)32. These studies coincide with findings in our study that the delay in surgery is related to the poor HHS, hence poor outcome.

5. Conclusion

Hip fracture is a common and debilitating injury requiring hospital admission. Patients with hip fracture having CVD have greater risk of hip fracture with longer length of hospital stay and hence higher cost per hospital stay. Presence of more comorbidities along with CVD shows a significant association in the functional outcome. Effective prevention for falling in older patients with CVD, screening of osteoporosis, control of hypertension with proper physical activity and improved nutrition could be important strategies for reducing the increased occurrence of hip fracture.

6. Source of Funding

7. Conflict of interest

None declared.

8. Ethical approval

The study was approved by the institutional ethics committee.

Acknowledgments

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Author biography

Khushwinder Singh, Junior Resident https://orcid.org/0000-0002-9482-4427

Pankaj Mahindra, Professor https://orcid.org/0000-0003-2725-4900

Rajnish Garg, Professor and Head