

Result of Internal Fixation and Posterior Muscle Pedicle Bone Grafting in Old Fracture Neck Femur.

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ABSTRACT

Background: Ten (10) cases of old fracture neck femur were treated by internal fixation and posterior muscle pedicle bone grafting of quadratus femoris and quadrate tubercle bone block. **Methods:** The treatment period were from January 2017 - June 2018 (approx 18 months) at Burdwan Medical College Hospital. We did this procedure by open reduction and internal fixation by cannulated hip screws and muscle pedicle bone grafting. Follow up period was 1 to 1.5 years (average 14 months). **Results:** Evaluation parameters were union, non union collapse of neck, osteonecrosis of femoral head, pain, range of movement and functional activities and overall satisfaction of patient. The results of fracture healing rate was good (7), fair (2) and poor (1). The technique is simple, rewarding and easy access of fixation and muscle pedicle bone grafting. **Conclusion:** Bone graft was placed by making a gutter at fracture site and maintained by a screw or prolene suture.

Keywords: Femur, Fracture, Internal Fixation.

INTRODUCTION

Displaced intracapsular fracture of the neck femur in young and middle aged person is really a challenge to the treating surgeon. Fracture of the neck femur, being intracapsular and in a weight bearing extremity, requires accurate reduction of fragments and satisfactory internal fixation of a fracture, if the complications like non-union and late segmental collapse are to be prevented. Hundreds of techniques devised for the treatment of this fracture can explain the futility of one or other method to achieve satisfactory results in all patients. While treating the patient having this fracture, the aim should be to provide painless, stable, mobile hip joint with viable head inside the acetabulum. Meyers tried to treat the displaced intracapsular fracture of the neck femur with live osteomuscular graft and internal fixation to enhance the revascularization of the proximal fragment of the fracture and reported substantial decrease in the rates of non-union and late

to evaluate the outcomes of this procedure based on clinical and imaging parameters and to demonstrate the bony incorporation of muscle pedicle graft and subsequent union.

MATERIALS AND METHODS

Study Population

The study will be conducted on patients of displaced intra-capsular old femoral neck fractures, meeting the inclusion and exclusion criteria, in the Department of Orthopaedics, Burdwan Medical College & Hospital.

Inclusion Criteria

1. Age >12 years and <40 years
2. Closed, displaced intracapsular fractures
3. Fractures >3 weeks old

Exclusion Criteria

1. Age < 12 years, > 40 yrs
2. Open fractures
3. Pathological fractures
4. Fractures < 3 weeks old

Study Period

January 2017 - June 2018 (approx 18 months)

Sample Size: 10 Patients

Sample Design: Patients screened through the exclusion criteria and matching the inclusion criteria will be consecutively included in the study

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with their informed consent till the desired number of sample has been obtained.

Study Design: Institution based prospective, longitudinal study

Study Tools:

Pre-operative: Skiagrams of hip (AP+Lat), Traction and internal rotation view.

Post-operative: Skiagrams of hip (AP+Lat)

Evaluation: Evaluation of union of fracture by x ray and functional assessment by pain, range of movement, and functional activity.

Methodology

Required data was collected from patients attending OPD, during their stay in hospital as inpatients, and during their follow-up.

- All patients included in study will be assessed clinically with physical examination and confirmed with radiology and imaging.
- Written and informed consent
- Pre- op investigation and pre-anaesthetic check-up.
- Open Reduction and Internal Fixation with titanium cannulated cancellous screws and Quadratusfemoris muscle pedicle bone graft..
- Post-operative management.
- Routine follow up was done at 6 weeks, 3months, 6 months and then every 6 monthly. Follow up for minimum 6 months was done to access the following results: Union: Clinicalandradiological, Time taken for union.

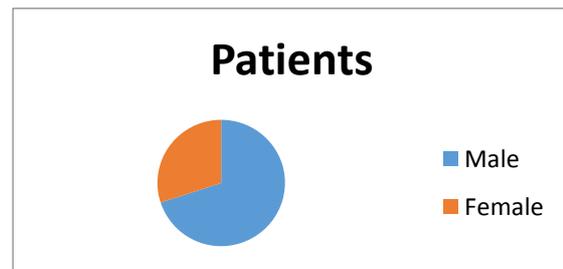
Surgical Steps

After spinal anaesthesia patients were positioned prone on fracture table. Neck was opened through Moore's approach. Open reduction was done and 5 cm bone block from quadrate tubercle with the quadrates femoris muscle itself was inserted in the gap between two fracture fragments and fixed with cannulated cancellous screws under c-arm guidance.

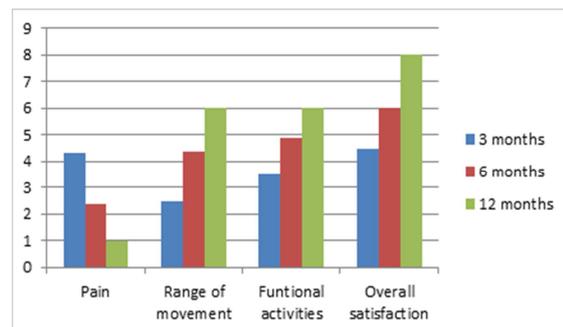


RESULTS

Range of motion was well maintained in all the patients. Harris hip score was good in 70% of patients, fair in 20%, poor in 10% of patients. Mean time of union was 6.3 months. One (1) patient developed non-union. One (1) patient developed superficial wound infection and was managed with oral antibiotics. No implant failure occurred. One (1) patient developed hypertrophic scar.

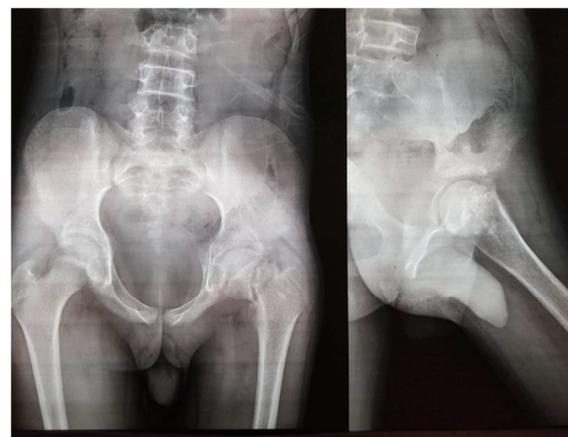


Outcome	Result
Mean operative time	2hrs 10 mins
Average blood loss	400 ml
Length of incision	12cm(8-14 cm)
Hospital stay	14 days(12-16 days)
Union rate	90%
Average time for union	6.3 months

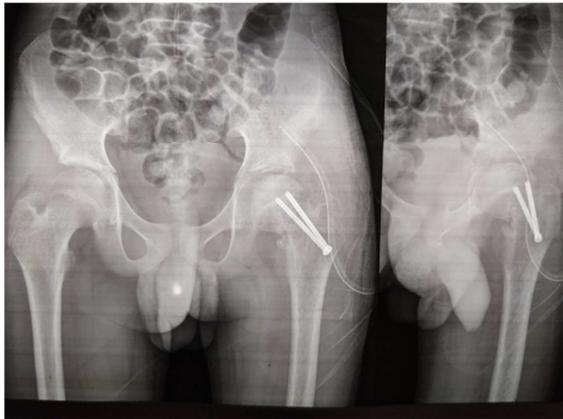


Complications

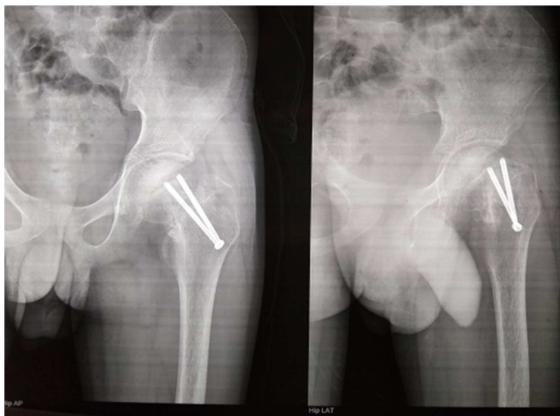
Wound complication	10%
Non union	10%
Osteonecrosis	0%



Pictures: Pre OP



Immediate POST OP



6 Months Follow UP

DISCUSSION

The treatment of femoral neck fracture is still a matter of controversy even after so many recent advancements in orthopaedics. Non-union and AVN are the two main complications of this fracture. The rate of non-union has been reduced by anatomical reduction and stable fixation of fracture but the incidence of AVN is evident. In 1962, the autogenous muscle pedicle graft based on the quadratus femoris muscle was done for the first time. Late, fresh autogenous cancellous iliac bone chips combined with muscle pedicle bone grafting have been reported to be good. There have been encouraging reports by using similar technique. In femoral neck fracture, bone grafting is the scope of fracture healing process, only dependent on the role of bone marrow into the bone to complete. So the blood supply of fracture and its stability during the healing process will be decisive factor. According to MeiFang FuiI such as healing of femoral neck fracture and femoral head vitality ultrastructure study confirmed that the femoral head after femoral neck fracture severely damage the blood supply. Anatomical reduction, impaction and rigid internal fixation are essential in treating femoral neck fracture. Muscle pedicle bone grafting has been advocated by many investigators along with rigid internal fixation to prevent Nonunion and AVN of

femoral head. This provides an additional source of blood supply for the femoral head which may have been rendered ischaemic by the fracture and also allows reduction and impaction of the fracture under direct vision. Reduction of blood supply of fracture of femoral head depends upon the type of fracture and age of fracture. Stable and reliable fixation are closely related to AVN and blood supply of femoral head. The postoperative mode of immobilization depended upon the rigidity of the fixation and the age of the patient. Partial weight bearing was allowed gradually depending upon the status of union. Full weight bearing was allowed only after full osseous union on an average of 1 year after the operation.

CONCLUSION

We conclude that muscle pedicle bone grafting with interval fixation is a very rewarding method of treatment of femoral neck fracture with late presentation. This treatment can promote the fracture healing and reduce the incidence of avascular necrosis. This kind of surgery can improve the union of fracture and reduce osteonecrosis incidence of the femoral head.

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