SUMMARY

Femoral neck fractures, though known from time immemorial, and still continuing as a common orthopaedic problem, especially regarding nonunion and avascular necrosis. Non-union and avascular necrosis after femoral neck fracture is a challenging problem even today. It poses great challenge to orthopaedic surgeons regarding its management. Significant differences of opinion persist regarding the modalities of treatment that are used.

The key to get success in management of these fractures is anatomical reduction, impaction and rigid fixation.

Development of late segmental collapse due to avascular necrosis inspite of anatomical reduction and secured fixation led the surgeons to think upon the third essential factor of improving the vascularity of femoral head.

Meyer et al in 1974 reported in his series of 144 cases that in femoral neck fractures treated by muscle pedicle bone grafting alongwith internal fixation; the rate of union was 95% and late segmental collapse occurred in only 5% of the cases which had united.
Baksi in 1986 treated 56 patients of ununited femoral neck fractures by internal fixation with Moore's pins along with muscle pedicle bone grafting and achieved union in 87.5% of cases and avascular necrosis in 3% of cases.

The aim of our present study is to establish the role of open reduction, internal fixation with muscle pedicle bone grafting for the management of fresh, neglected as well as ununited femoral neck fractures.

The variety of factors contributing to the problems of non-union and late segmental collapse have been reviewed by many authors. Barnes and associates in 1976 divided the source of trouble into two groups:

1. Those over which surgeon has no influence. This includes — old age, female sex, high level of fracture, Garden type III or IV fractures and osteoporosis.

2. Those over which surgeon has great deal of influence — the acceptance of extreme valgus or varus reduction, high and anterior placement of fixation device, comminution and premature ambulation.

A study of 20 cases of fresh as well as neglected or ununited femoral neck fractures treated by multiple Moore's pins fixation with muscle pedicle bone grafting was conducted at Orthopaedics Out Patient Department and Emergency Department of M.L.B. Medical College Hospital, Thane.
Quadratus femoris muscle along with bone graft of size of length of entire width of quadratus femoris muscle x 1.5 to 2 cm. broad x 1 to 1.5 cm. thick from intertrochanteric crest was lifted and fixed, in the gutter made on posterior surface of neck and head, with staple after fixation of fracture by Moore's pins. The age of patients varied from 14 to 60 years with the average age of 37 years. The majority of cases were transcervical and Garden type III fractures. 50% of cases were fresh as they could be operated within 3 weeks of injury and rest of them were either neglected or ununited fractures. Per-operative, 70% of cases showed marked posterior comminution and in 25% of cases inter-position of capsule or periosteum layer was found. Posterior comminution posed difficulty in reduction. Pins provided secured fixation, union occurred in 85% of cases.

The muscle pedicle bone graft spanning the fracture united to the head and neck of the femur when fragments were in either a satisfactory or in slight valgus position. The grafts remained viable throughout. There was no instance in which the bone of the muscle pedicle graft appeared to be absorbed or decreased in size. An increase in the size of bone graft was frequently noted on roentgenograms.

The cases having good to satisfactory reduction were united except 2 cases. One out of these two cases
had earlier undergone for Mc Murray's osteotomy and he went for muscle pedicle bone grafting after 2 years, developed avascular necrosis and his fracture remained ununited. In other case, fixation was insecure and reduction lost in second follow-up radiograph. Two out of 19 cases of secured fixation went under non-union. In one out of these two cases, reduction could not be achieved and the other case had earlier undergone Mc Murray's osteotomy as described above.

Out of 20 cases, 3 (15%) developed superficial infection which was controlled by systemic antibiotics and with sterile dressings. One case (5%) developed avascular necrosis but this case had undergone Mc Murray's osteotomy earlier. One case (5%) showed extrusion of pins.

Union occurred in 85% of cases. All of whom except one were able to walk unsupported, had good range of movements at hip joint, could squat and sit cross legged and hence were graded as good result (80%). One case who had union but had restriction of adduction and internal rotation with pain at extremes of movements, was graded as satisfactory result.

In three cases fracture failed to unite but one of them, who had undergone earlier Mc Murray's osteotomy could walk unsupported and had painless range of movements, was also graded as satisfactory result. This patient was very happy as the stability of hip improved and pain was
relieved. Two cases had non-union and could not walk unsupported were graded as poor results (10%).

Following conclusions were drawn from the present study –

1. Open reduction provides an opportunity of direct visualization of the fracture site.

2. Soft tissue interposition in the form of capsule can be removed which is otherwise not possible by closed reduction.

3. Open reduction also provides an opportunity to freshen the fracture surfaces and decompression of necrotic bone which encourages the growth of vascular granulation tissue, so useful for union.

4. Posterior capsulotomy does not hamper the blood supply of femoral head.

5. Accuracy of reduction of fracture can be viewed directly.

6. Multiple pins provide secured fixation and cause minimum damage to cancellous bone.

7. Inlay muscle pedicle bone graft increases the vascularity, acts as strut across the posterior cortical defect, prevents posterior tilt of femoral head, thus encourages osteosynthesis and revascularization of femoral head.
8. The rate of union is higher, in the cases treated by open reduction, internal fixation with muscle pedicle bone grafting as compared with other methods of treatment.

9. The rate of avascular necrosis and segmental collapse is reduced.

10. The natural femoral head is retained, which provides better quality of life.

11. The complications are few and insignificant.