Complications Of Treatment Of The Subtrochanteric Fractures Of The Femur By Russell-Taylor Reconstruction Nail

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Abstract

Thirty cases of closed subtrochantric fractures were treated in adults by Russell –Taylor Reconstruction nail between March 2004 and September 2005. Complications of this modality of treatment are described. Complications were divided into-intraoperative and postoperative complications. Difficulty in the placement of proximal locking screw was the most common complication in the first group followed by difficulty in close reduction of the fracture. Amongst the postoperative complication proximal thigh pain and limb length discrepancy were the main complications. None of these complications, however, contributed adversely to the final outcome of results. The findings of this study revealed that Russell-Taylor Reconstruction nail is the preferred treatment for complex proximal femoral fractures and complications associated are minor and do not significantly contribute towards the final outcome. Moreover these complications decline as the learning curve progresses.

INTRODUCTION

Fractures of the proximal femur and hip are relatively common injuries in adults. The incidence of these injuries is increasing due to the increase in the life expectancy of the population. These fractures are associated with substantial morbidity and mortality, approximately 15-20% of these patients die within one year of fracture [1].

The subtrochantric region extends from the bottom of the lesser trochanter to a point 5 cm more distally; fractures that extend proximally are termed as subtrochantic-intertrochantric fractures [2]. Subtrochantric fractures account for 5-11% of all upper third femoral fractures, and 26.7% of those in the peritrochantric region and have log been recognized as the most difficult to treat [3].

These fractures have traditionally been treated by dynamic extra-medullary implants [4]. The introduction of closed itramedullary nailing of these fractures has addressed many shortcomings of extramedullary static or dynamic fixation. It offers several advantages. The intramedullary location of the implant and its loading sharing property, non opening of the fracture site and thus preservation of the soft tissue envelop, facilitation of healing by the bone graft provided by the intramedullary reaming makes it the treatment of choice in these fractures.

Russell-Taylor nailing of subtrochantric fractures is however, technically demanding and is associated with perioperative and post-operative complications. The present article analyses the complications of this procedure in a series of thirty cases.

MATERIALS AND METHODS

Thirty cases of closed fractures of subtrochantric region of femur in the age group of 18 and 55 years were operated in the Hospital for Bone and Joint Surgery, Srinagar between March 2004 and September 2005. The average patient age was 37 years. There were 23 male and 7 female patients. Right side was involved in 16 and left in 14 cases respectively. Road traffic accident was the cause of injury in 14[47%] and rest trauma was due to fall from height.

Fractures were classified by Seinsheimer's system. Type III A and IIB were the most common type of fracture pattern.

Patients were operated between 2 and 16 days [range, 7.5 days] after trauma. General, spinal or epidural anesthesia was administered for the operative procedure.

Operative procedure: The procedure was carried out on a fracture table with both limbs secured to the foot holders. Soft tissue dissection was carried out to identify the entry point in the piriform fossa .A guide wire was placed in to the

medullary canal and the canal was reamed to 14 mm in the proximal part and one diameter more in the distal part, to accommodate the nail. Proper size nail was hammered into position. Proximal locking was achieved with the help of the jig whereas the distal locking was done by fee hand technique. Whole procedure was carried out under image intensifier.

Touch down weight bearing was allowed as soon as the patient was willing to ambulate. Subsequent progressive weight bearing was allowed on the basis of radiological progression of union. Patients were followed at serial intervals and final assessment was done at 6 months after the index procedure. In the present review only complications of the procedure have been considered.

RESULTS

Complications encountered during the procedure on thirty cases are presented in Table I

Figure 1

Table 1

Serial no	Complication	No of cases	Percentage
1	Difficult closed reduction	3	10
2	Drill bit breakage	1	3.3
3	Difficult proximal locking	9	30
4	Failed proximal locking	1	3.3
5	Infection	1	3.3
6	Proximal screw back out	1	3.3
7	Proximal thigh pain	4	13.3
8	Distal thigh pain	2	6.7
9	LLD* shortening <2 cm	3	10
10	LLD lengthening	1	3.3
11	Stiff knee	1	3.3
12	Varus malreduction	6	20

Complications were classified as intraoperative and postoperative (Table II). The most common intraoperative complication was difficult proximal locking, followed by varus malreduction and difficult closed reduction.

Proximal thigh pain was the most common complication seen in the post-operative period followed by limb length discrepancy and distal thigh pain. Infection was seen in one case only. Proximal locking screw backed out in one case. In one patient limb lengthening was seen and stiffness of knee developed in another.

Figure 2

Table 2

Intraoperative	Postoperative
1. Difficult closed reduction	1. Infection
2. Drill bit breakage	2. Proximal screw back out
3. Difficult proximal locking	3. Proximal thigh pain
4. Failed proximal locking	4. Distal thigh pain
5. Varus malreduction	5. LLD* shortening <2 cm
	6. LLD lengthening
	7. Stiff knee

*LLD-limb length discrepancy

DISCUSSION

The advantages of the Russell-Taylor reconstruction intramedullary nailing in the treatment of sub-trochantric fractures of femur are well documented. Exposure of the fracture is not necessary, soft tissue dissection and subsequent devitalization is markedly reduced, fracture haematoma is not drained besides the reamings are dispersed into the fracture. In addition, this technique reduces the need for blood transfusion, is cost effective to the patient and the hospital stay and time to return to work are reduced.

Russell-Taylor reconstruction nailing has evolved through the years to reach the present state of the art, creating new standard of care for the sub-trochantric fracture of the femur. This technique has assumed prominent place in the internal fixation of sub-trochantric fracture of femur with predictable and rewarding results.

Like all other surgical procedures, intramedullary nailing is associated with intraoperative and postoperative complications. The incidence of these complications is clustered at the beginning of the learning curve and with the refinement of skill there is a decrease in the number of unfavorable outcome. A similar trend was seen in the present series, and the type of complication was on the pattern previously reported in the literature.

During the course of the present study there was difficulty in closed reduction of fractures in ten percent of cases which was lower than that observed by Garnavos C et al [6] who reported this complication in 18% of their cases. This

difficulty occurred because of typical deformity of proximal fragment i.e. flexion, abduction and external rotation. This was subsequently overcome by putting in a Steinmann pin in the proximal fragment as advocated by Coleman et al [7] and using it as a joystick before making portal of entry. The incidence of breakage of the drill bit was higher than that reported in literature [8] . The difficulty in proximal locking is a common complication reported in the literature. Our rate of this complication is consistent with observations made by other authors [6] .In all these cases only one proximal locking screw was placed.

During the course of this study infection at distal screw site was seen in 3.3% cases. It responded to antibiotics and debridement. The rate of screw back out and proximal thigh pain was consistent with other studies [9] . Limb length discrepancy in our study was recorded in four patients. Among these three patients had shortening less than 2 cm that accounted 10% of all cases and one case had 1.5 cm lengthening. These observations are consistent with the observation of Bose WJ [10] who reported shortening in 16.7% of cases and Wiss DA 11 who reported lengthening in 1.05% cases. French BG [11] reported 5-15% varus malreduction in 61% of their cases in a retrospective study. The incidence of this complication was 20% in our cases. This did not, however, affect the final outcome in our series.

Intraoperative complications declined during the course of this study and there was no major postoperative problem requiring repeat procedure. The final functional outcome was excellent in majority of the cases treated with Russell-Taylor Reconstruction nail.

CONCLUSION

This study suggests that the Russell-Taylor reconstruction nail is the preferred implant for subtrochantric fractures because of its significantly great strength, stiffness and torsional rigidity .The potentially negative features of the reconstruction nail include the surgical learning curve, limb length discrepancy, and implant prominence. A failure with the use of this implant is largely due to surgical inadequacies and can be minimized by proper preoperative planning and meticulous surgical technique.

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