Original Article

Treatment Evaluation of Concomitant Femoral Neck and Shaft Fractures

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Abstract

Background: To evaluate the results of fixation of fracture neck of femur associated with fracture shaft of femur, by reconstruction nail or lag screws with conventional nail system.

Methods: In this descriptive study, 22 patients, with ipsilateral femoral neck and shaft fracture were included. Reconstruction nails were used in 16 cases and cancellous lag screws in 06 cases, where femur had been already fixed with k nail and interlocking nail.

Results: Majority (90.9%) were male. Complex fracture of femoral shaft and neck was seen in 72.72%. In majority (81.81%) type II Gorden Fracture took place. Patients were mobilized on crutches on second day of surgery and were not allowed weight bearing till union of neck of femur. No case of avascular necrosis or non union of neck fracture was noted.

Conclusion: Reduction of neck fracture is the key factor for good outcome. Patients with complex fractures requires minimally invasive techniques. There should be lesser soft tissue dissection to prevent complications. Where reconstruction nail is not possible two to three lag screws with good reduction of neck of femur has satisfactory results.

KeyWords: Fracture femur; Reconstruction nails; Cancellous lag screws; k nail; Interlocking nail.

Introduction

Fracture shaft of femur associated with femoral neck fracture has problem of high complication rate. These dual fractures are usually encountered in young, associated with high velocity injury and usually accompanied by multisystem involvement. Ipsilateral femoral neck fractures occur in 2.5% to 5% of patients with femoral shaft fractures. In the literature incidence of missed injuries is as high as 50%. Early recognition of this injury is required to prevent the inherent disabling complications like non union or avascular necrosis of head of femur.

The incidence of road traffic accidents is increasing. The conditions of roads, traffic excess and change of temperament from peaceful to more aggressive, has increased the number and the extent of injury. Despite of the rule of having x-rays of pelvis for all fractures of femur, cases are encountered where fracture of femur is managed without diagnosis of neck of femur. 15% to 25% missed diagnoses have been noted. There are different choices of fixation system available like reconstruction nail, DHS and DCP combined, DHS or screws combined with external fixator, universal nail system or long gamma nail. Use of Enders nail has been reported for such complicated fracture combination.

Patients and Methods

In this descriptive study, 22 patients, 20 males and 2 females were included. Sixteen patients were diagnosed having complex fracture, shaft of femur associated with fracture neck of femur. Among them 9 had fracture of femur at mid shaft and 6 proximal shaft and one distal shaft fractures. Four patients had fixation of shaft of femur by interlocking nail or K nail. Two cases were diagnosed as fracture of shaft of femur but subsequent x-rays showed undisplaced fracture of neck of femur.

Sixteen patients were treated with reconstruction nail. For reconstruction nailing incision was given from tip of greater trochanter to 5 cm proximally. After making entry hole, guide wire was passed. Reaming was done. Guide wire was exchanged from reaming guide to nail guide with the help of plastic hollow tube. Reconstruction nail was introduced at one side and interlocking nail into contra-lateral side. Nail was attached with assembly and checked with k-wire through cannula so it could engage screws. Nail was needed to be hammered in or extracted few mm to permit two screws in the neck. Compression at fracture site was achieved. Distal locking screws were passed with fluoroscopic control and free hand technique.

Cancellous lag screws were applied to patient where already lateral was given below greater
trochanter about 5 to 7 cm. Lateral cortex was approached. Two to three k-wires were passed from antero-lateral aspect of proximal femur directed medially and posteriorly. Anteroposterior and lateral views were made to confirm the wire position. Cannulated drill was used to make the passage for cannulated screws. At least two or three screws were passed in this manner. Washers were used in one or two screws to get the compression at fracture site. Wound was closed over the drain.

Results

Time of surgery from spinal anesthesia was on average 2 hours and 13 minutes. Most of the time spent was due to patient positioning and reduction of neck at anatomical place in AP and Lateral position. Average exposure of C arm fluoroscopic radiation was 2.05 minutes. Out of 16 cases of reconstruction nail 6 needed to be opened at fracture site to clean the soft tissue interposition as these were more than a week old. All of the fractures were united in 3 to 6 months time. None of the cases developed avascular necrosis of neck of femur (Table 1). Out of 22 patients of neck fracture 18 were type II Gorden fracture while 4 were type III. Quadriceps exercises were started on the day of surgery, patients were mobilized on crutches on second day of surgery and not allowed weight bearing until sufficient evidence of union of neck of femur was seen on radiological assessment.

20 cases had motor vehicle accident, one patient fell from tree and one patient having long K nail protruding 2.5 inches from greater trochanter simply had excessive abduction while getting out of bed causing fracture of the neck of femur after 7 years of nailing. Wheeling (driving motor bike on one wheel) was the cause in 8 of 16 patients diagnosed initially. 7 of them has to remain in ICU, Two patients had head injury and 3 blunt abdomen and chest injury. 2 patients were admitted as multi trauma patients. Skeletal traction was applied before surgery, if surgery was delayed more than 48 hours. 20 patients were followed for more the one year.

Discussion

Ipsilateral fracture of hip with fracture shaft of femur is a complex injury pattern, which needs special consideration. The advantages of closed nailing for femoral shaft fracture over open reduction and internal fixation like DCP femur is well established. When shaft fracture is complicated with neck fracture, conventional interlocking nail is not considered as a suitable choice. In present series the 22 cases of ipsilateral hip and shaft fractures, were fixed with second generation reconstruction nail with the two cervical screw options proximally into neck and two distal screws applied by conventional method. Advantages of third generation nail over second generation nail include, multiple cervical screws options which provide added rotational and vertical stabilizing at neck and has inbuilt 7 degree of antversion angle. Lateral entry of nail from tip of greater trochanter minimizes any further vascular insult to femoral head & neck. Difficulty in placement of entry hole is the problem in such fractures. The tip of greater trochanter is safe to prevent the neck from displacement but can result in varus deformity of neck of femur. One case had varus deformity seen on post operative film, this patient had more lateral entry hole.

In three cases of neck of femur having difficulty in reduction, leg was disengaged from traction table before surgery Whiteman manipulation maneuver was done and foot was secured on traction table. The placement of two screws at proper place in the neck is also difficult if entry is too lateral or the proximal end of the nail too deep. K wires were passed with the guide of proximal jig to check placement of screws, nail can be withdrawn or hammered in to make better position, and K wires must be removed before this maneuver. There was one non union of shaft of femur which was replaced with normal interlocking nail eight months after first surgery. Three cases of superficial infection settled with 8 days of antibiotics.
Out of three delayed union, two united after 07 months. 18 patients regained hip movement more than 100 degree of flexion.

The injury is usually caused by high energy trauma and usually accompanied by injury to other organs. Early intervention is required to prevent complications like cardio-pulmonary problems and infections. Early mobilization of the patient and functional rehabilitation of the limb is the therapeutic goal in the treatment of such complicated cases. 7,8

Incidence of missed fractures of neck of femur is shown as high as 35-50% in literature. In present series incidence of missed fractures was 2/22. Routine recommendation of X-ray pelvis, with both hips-AP view, X-ray of ipsilateral hip in 15° of internal rotation in all trauma patients, can circumvent the problem. Long bone fractures in polytrauma patients should be fixed as early as possible as it reduces the patient's morbidity, mortality and also reduces the hospital stay and cost. Patients treated with traction after femoral neck fractures can develop life threatening pulmonary complications subsequently. Anatomical reduction of fracture neck of femur, precise entry point and proper placement of cervical screw are important surgical steps. 9-12

References


