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BILATERAL FEMUR SHAFT FRACTURE IN POLIO PATIENT: CASE REPORT

Dr.Hanumantharaya G H[1], Dr Prathap C[2], Dr Md Khalid K[3], Dr Asheem Kumar[4]

[1]Senior Consultant, Department of Orthopaedics, District Hospital, Chitradurga, Karnataka, India
[1, 2, 3] DNB PG Trainee, Department of Orthopaedics, District Hospital, Chitradurga, Karnataka, India
Corresponding Author: Dr.Hanumantharaya GH

ABSTRACT

Poliomyelitis is a viral infection which affects anterior horn cells, resulting in isolated muscle weakness and paralysis. Post-polio residual paralysis (PPRP) patients are commonly found in orthopedic department. The femur is most commonly fractured bone in post-polio adults. Team work by orthopedic surgeon, orthotist, and physiotherapist will give a satisfactory functional outcome. We report a case of bilateral femur shaft fracture in polio patient and managed with intramedullary nailing with good results.

Case report: 43 years old male patient, who is a post polio residual paralysis (PPRP) in right lower limb, had bilateral femur shaft fractures following self fall at his home. In first stage, we fixed the left femur shaft fracture fixed with intramedullary interlocking nail for non poliotic limb. In second stage, we fixed the poliotic limb femur fracture with Titanium Elastic Nailing System (TENS) after 5 days. We did open reduction and internal fixation of fractures with nails due to deformed bone narrow medullary canal. Post operatively patient's limb was protected with high above knee slab with 30 degrees flexion. Follow up of patient was done at 6 weeks, 3 months and at 6 months. At 6 months follow up patient was walking with auxiliary crutches without pain.

Conclusion: Intramedullary nailing for femur shaft fractures is a feasible, reliable, and less invasive method in Post polio residual paralysis patients. Postoperative rehabilitation will be demanding and it also influences the outcome.

Keywords: PPRP, femur fracture, Intramedullary nailing, TENS

INTRODUCTION

Patients with post-polio residual paralysis (PPRP) are commonly found in orthopedic emergency department. Poliomyelitis is a viral infection caused by a neurotropic virus that causes asymmetrical flaccid paralysis due to its affection of anterior horn cells, which leads to deformities and disabilities.[1] Increased osteopenia, quadriceps weakness and buckling of knee during walking are risk factor for falls and fractures. Poliomyelitis is also a risk factor for regional osteoporosis.[2, 3] Halstead defined PPS as the presence of two or more of the following symptoms: unaccustomed fatigue, muscle and/or joint pain, new weakness, functional loss, intolerance to cold or new atrophy.[4]

The femur is most commonly fractured bone in post-polio adults. Decision of surgical treatment in such fractures in the post-polio residual paralytic limb is critical.[5, 6] Hurdles will be faced at every step in achieving reduction, appropriate implant selection, rehabilitation, and union. Main aim in these fractures is early fixation and aggressive rehabilitation in an attempt to promote return to function. Modifications of conventional surgical techniques might be required in this patient group, and there may well be less predictable outcomes.[7] Team work by orthopedic surgeon, orthotist, and physiotherapist will give a satisfactory functional outcome.[8]

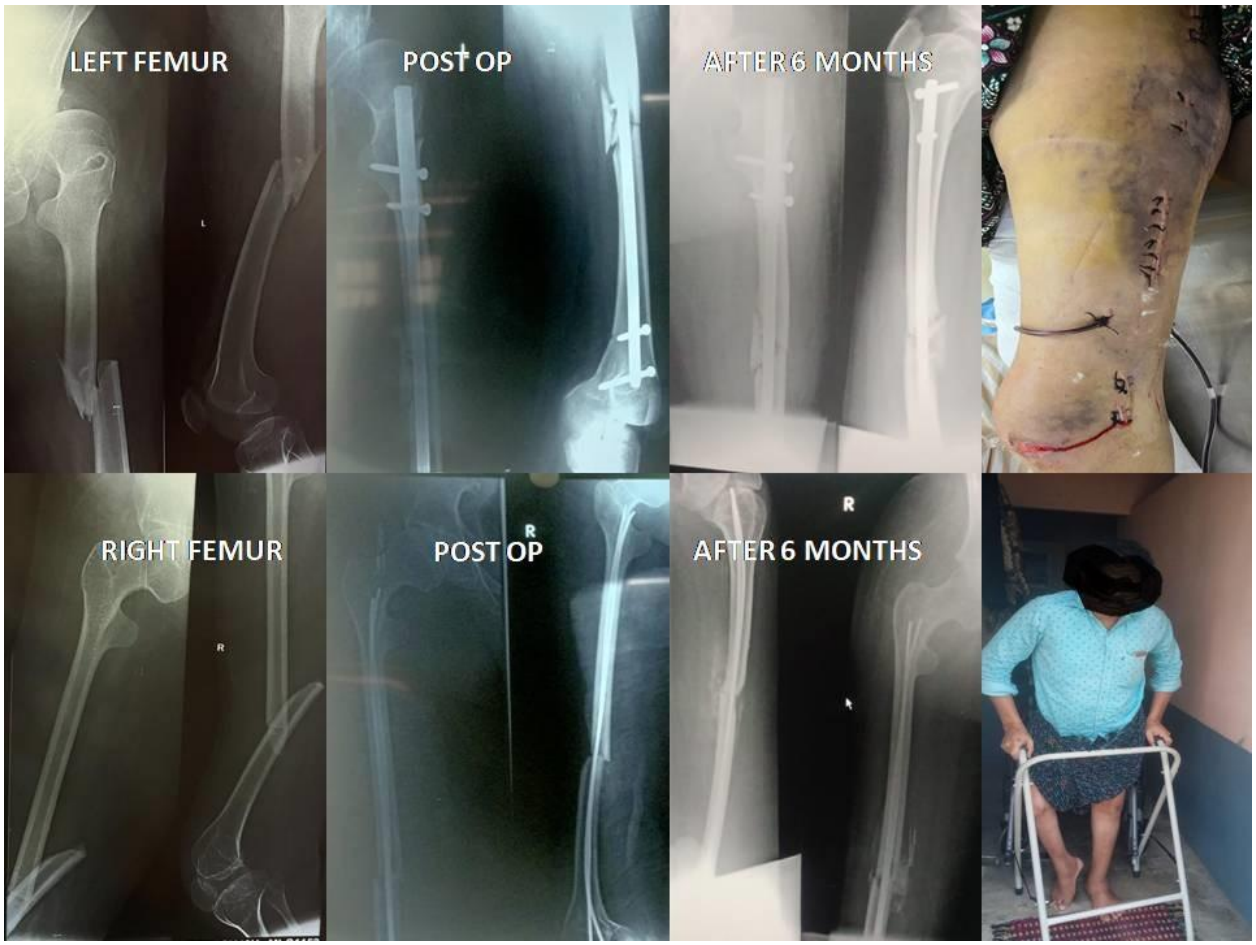
Case Report

We present a case report of a 43 years old male patient, who is a post polio residual paralysis (PPRP) in right lower limb. He had bilateral femur shaft fractures following self fall at his home. On examination the both thighs were painful swelling with crepitations felt over both femurs. Right lower limb showed severe atrophy of muscles of thigh and leg. Left lower limb appears to be normal. There was a limb length discrepancy of 4 cms and without neurovascular compromise. Radiographs of the bones at right lower limb were hypoplastic and osteoporotic in nature. We planned the surgical management of bilateral femur shaft fractures in two stages.

Patient was taken up for surgery for non poliotic limb fracture in first stage. Under spinal anaesthesia with all aseptic precautions, patient was positioned over fracture table in supine position. Under fluoroscopic guidance, we fixed left femur shaft fracture fixed with intramedullary interlocking nail. Because of deformed bone, narrow medullary canal, we faced difficulty in access to correct entry point and nail insertion. Fracture site was opened because of difficulty to get reduction by closed method. Fracture reduction was confirmed under image guidance in all views. Post operative period was uneventful.

Second stage surgery was planned after 5 days for polio affected limb. Under spinal anaesthesia patient was placed over OT table in supine position with bolster at underneath the knee. Two entry portals were created distal to the fracture site in the cancellous bone for insertion of 3mm pre bent TENS nail medially and laterally. We faced fracture reduction by closed method because of deformed bone, narrow medullary canal, and knee flexion deformity of polio limb. Fracture site was opened because of difficulty to get reduction by closed method. Under direct vision fracture was reduced and TENs nails were passed up to neck of femur. Position of nails and reduction of fracture was confirmed under image guidance in all views. Post operatively patient's limb was protected with high above knee slab with 30 degrees flexion. Post operative period was uneventful.

Follow up x-rays at 6 weeks post op showed callus formation and above knee slab was removed. On examination fracture site pain was significantly reduced. Patient was mobilized with axillary crutches. Patient was kept non weight bearing till early consolidation was seen on x-rays. Knee physiotherapy exercises were continued. Follow up of patient was done at 6 weeks, 3 months and 6 months. At 6 months follow up patient was walking with auxiliary crutches without pain at fracture site.



DISCUSSION

Poliomyelitis causes acute flaccid paralysis of the affected limb. This condition leads to wasting of the surrounding muscles as well as osteoporosis. A study by *Goerss et al.* (2014) on polio survivors showed that there is a 48% chance of any fracture after 40 years of age.[9] Bickerstaffe et al. in 2010 studied the frequency of fall in 305 polio subjects. They found that 74% had at least one fall in 1 year and 60% had two or more falls.[10]

Quadriceps weakness and gait is imbalanced in these patients due to deformities, contractures, limb length discrepancies, and improper distribution of muscle forces. Osteoporosis is one of the most common associations of post-polio residual paralytic patients.[10]

In some cases, with extreme bony distortions intramedullary devices like titanium elastic nailing system or Rush pins should be considered for fixation. Flexible nails are sufficient to provide stability to the fracture with minimally invasiveness and protect biology at fracture site. Positioning the patient over a fracture table for nailing may be difficult. The patient can be operated in the supine or lateral position as per the surgeon's preference. Reduction can be sometimes really difficult because of the contracted iliotibial band. Hence, manual traction with different degrees of knee flexion is sufficient to align the fracture. Strong traction should be avoided in flaccid limb of polio patients as it may result in over distraction or displacement of fracture fragments.[11]

Postoperative management and rehabilitation are more demanding. One should avoid immobilization for longer periods. Appropriate braces or orthotic support and proper rehabilitation protocol will give a satisfactory outcome. Obesity, social causes, motivation, or mental state of the patient also has implications on the rehabilitation and outcome. [12]

CONCLUSION

Intramedullary nailing for femur shaft fractures is a feasible, reliable, and less invasive method in Post polio residual paralysis patients.

Clinical message

Thorough preoperative planning is very important; one has to know preexisting deformities, shape, and quality of the bone, so it helps in achieving satisfactory reduction and fixation with appropriate implants. Postoperative rehabilitation also influences the outcome.

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