

CASE REPORT - ORTHOPAEDICS

MANAGEMENT OF POST SEPTIC SEQUALE OF HIP WITH NECK OF FEMUR NON-UNION IN CHILDREN

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Abstract

BACKGROUND: Post Septic Sequale of Hip with Neck of femur Non-Union in children is a rare presentation. Two paediatric cases from Orthopaedics department, Institute of Child Health, Egmore were selected for this study with complaints of painless limp, hip abduction restriction, deformity and shortening of femur. These cases were surgically treated with Proximal femoral valgus osteotomy and bone grafting with fibular strut graft and these patients were followed at 2nd, 6th, 10th month. At the last follow-up, these two children were evaluated clinically and radiographically - consolidation at the site of non-union, normal gait pattern were observed.

CONCLUSIONS: Conclusions: Proximal femoral valgus osteotomy and bone grafting with fibular strut graft continues to be the best treatment for post septic sequelae of the hip with good results.

KEYWORDS: : Osteotomy, non-union, Avascular necrosis

INTRODUCTION

Septic arthritis leading to coxa vara and non-union are rare cases and only a fewer similar cases are reported at the literature [3, 4]. Two paediatric cases from Orthopaedics department, Institute of Child Health, Egmore with Post septic sequelae of hip with arthritis with Coxavara. The main stay in the treatment is proximal femoral valgus osteotomy and adductor tenotomy. Early diagnosis and treatment of septic arthritis of the hip will prevent the sequelae leading to triradiate cartilage and capital femoral physis premature closure, dysplasia of acetabulum, avascular necrosis of the articular cartilage and head, femoral head damage and ankylosis of hip.

METHODOLOGY

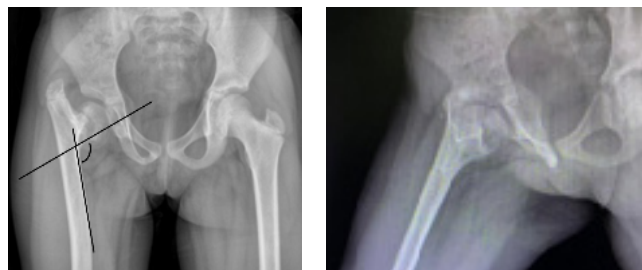
Two paediatric cases of post septic sequelae of hip non-union neck of femur with coxa vara presenting at Orthopaedics department, Institute of Child Health, Egmore, Chennai were selected for this study and valgus osteotomy of the proximal femur and bone grafting with fibular strut graft were done for the treatment of sequelae of infantile hip septic arthritis. Follow up was done at 2nd, 6th and 10th months and assessed for consolidation. After adequate union was achieved implant exit was done at 1 year. At the last follow-up at 18 months postoperative evaluation, the patients were assessed for consolidation of non-union, Trendelenburg gait, right lower extremity alignment, level of greater trochanter, and level of centre of femoral head, pelvitrochanteric muscles, Hilgenreiner-epiphyseal angle, stability of the hip, mechanical efficiency and lower-extremity length discrepancy status.

CASE ILLUSTRATION

CASE1

An 8 year old girl came to OPD with complaints of limping and shortening of right lower limb since 3 years. During 6th month of her age she was diagnosed with Bilateral septic arthritis knee joint, was treated by Bilateral knee arthrotomy and with IV antibiotics and above knee slab for 3 months, in a local government hospital. Then patient lost follow up. Then patient was started to have limping gait with shortening of right lower limb for past 3 years on irregular treatment. At presentation she demonstrated: pelvic obliquity, Trendelenburg gait, right hip flexion 120°, extension 10°, adduction 20°, abduction 30°, internal rotation 30°, external rotation 40° and limb length discrepancy of 3 cm shortening of right femur.

Pre OP X- Ray:



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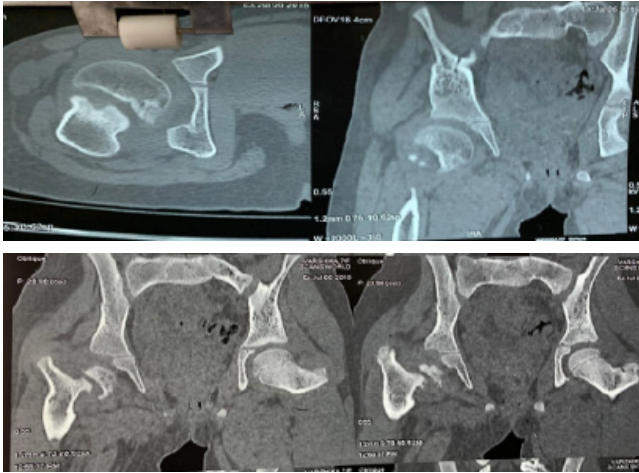
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Plain X-ray AP view showed decreased neck-shaft angle - 95°, proximal migration of femur, greater trochanter overgrowth and capital physis is vertically placed. Hilgenreiner-Epiphyseal angle - 75° and classified under Choi Type IIIB.

Pre OP CT

Pre OP CT shows neck of femur is resorbed with small femoral component with non-union of neck of femur. An MRI screening show Head of femur is viable.



Operative Procedure

In fracture table, through lateral approach proximal femur is exposed. Under C-Arm guidance reduction done and it is provisionally fixed with two guide wires. Fibular graft harvested from ipsilateral leg and it is placed over neck of femur through the guide wires. Valgus derotation osteotomy done and it is fixed with contoured recon plate. Patient was on Hip Spica for 6 weeks. Non weight bearing was advised till union. Periodic follow up was done till union.



With this valgus derotation osteotomy, the neck-shaft angle increased from 96° to 136° postoperatively. The greater trochanter was transferred inferiorly and laterally to restore normal tension of the pelvitrochanteric muscles. The Hilgenreiner-Epiphyseal angle was 35° postoperatively.

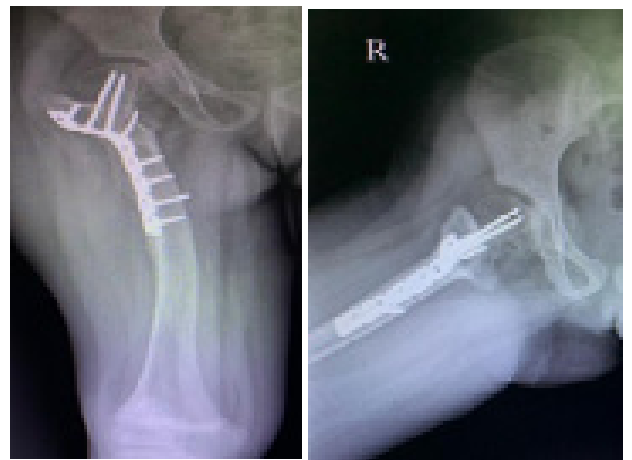
Follow up



At 2 months



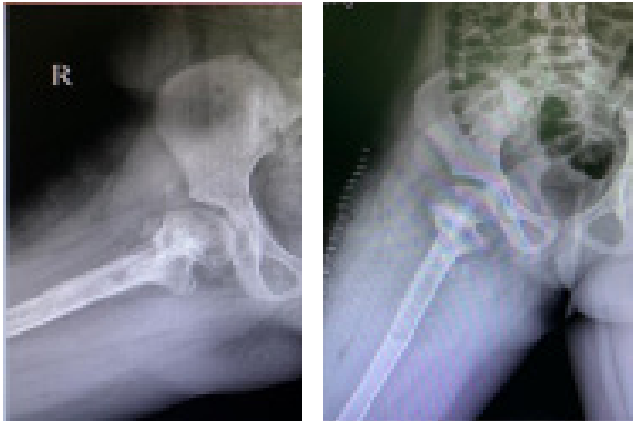
At 6 months



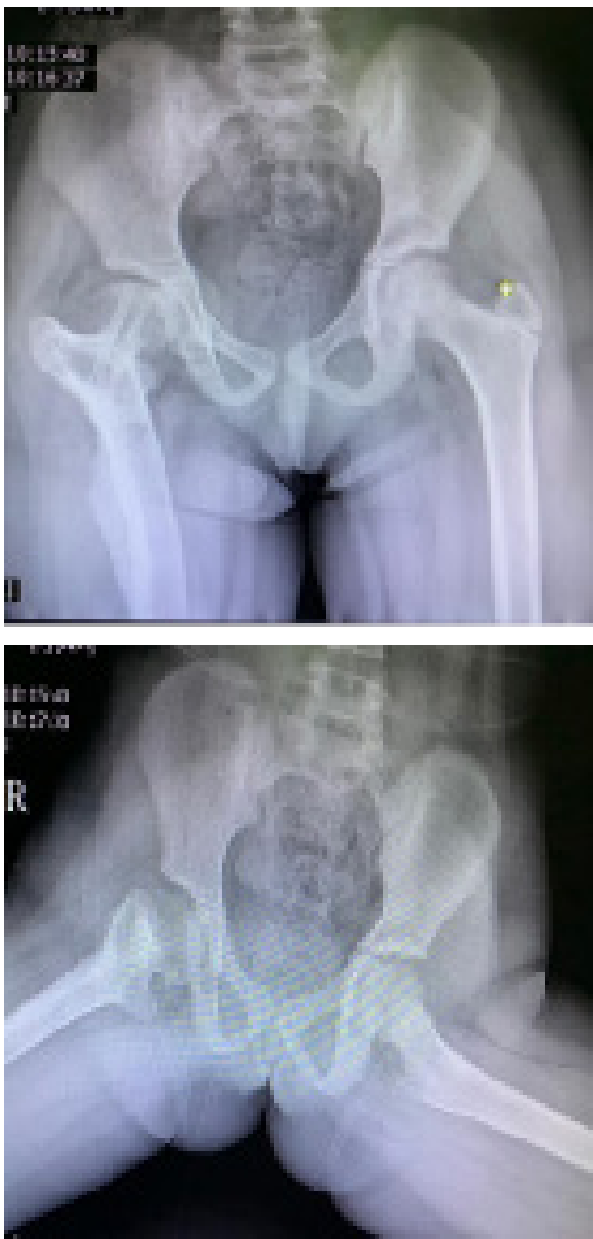
At 10 months

Follow up at 1 year

After 1 year of the operation, the consolidation of the osteotomy was evident and planned for implant exit.



Follow up at 18 months



At 18 months follow-up, child showed improved range of movements with Flexion - 120°, extension - 8 to 10°, adduction - 35°, abduction - 45°, and rotation - 30° internally and 35° externally and X-ray showed healed osteotomy site. No difficulties in squatting, running, climbing stairs and walking. Shortening of 3 cm was present and planned for limb lengthening procedure in future; x-ray showed neck



CASE 2

A 3 year old girl came to OPD with complaints of limping and shortening of left lower limb. During 2nd month of her age she was diagnosed with left side septic arthritis hip joint, was treated by left hip arthrotomy and with IV antibiotics, in ICH. Then patient was started to have limping gait with shortening of left lower limb for past 2 years. At presentation she demonstrated: pelvic obliquity, Trendelenburg gait, left hip flexion 110°, extension 10°, adduction 25°, abduction 30°, internal rotation 25°, external rotation 30° and 2.0 cm of shortening of right femur.

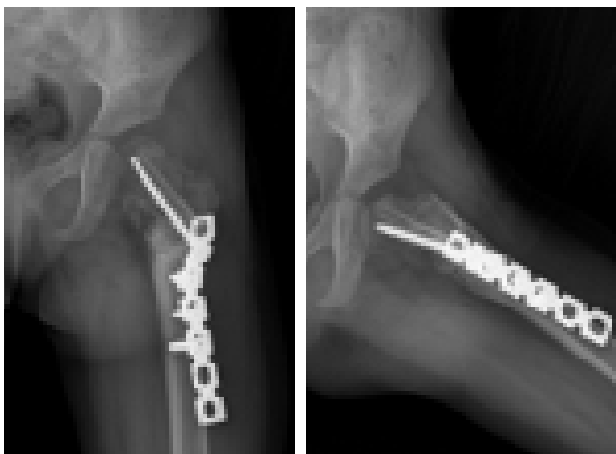
Pre OP X- Ray



Plain X ray: AP View showed reduced neck-shaft angle - 95°, proximal migration of femur, greater trochanter overgrowth and capital physis is vertically placed. Hilgenreiner-Epiphyseal angle - 85°. Pre OP CT shows neck of femur is resorbed with small femoral component with non-union of neck of femur. An MRI screening show Head of femur is viable.

Post OP X-Ray

Valgus derotation osteotomy with fibular strut grafting was performed in a similar way and post-operative period was uneventful.

Follow up at 2 months**Follow up at 6 months**

At the last follow-up, patient's range of motion improved with flexion -120°, extension - 10°, adduction 30°, abduction 40°, and rotation internally 30° and externally 35° and able to perform squatting, running, climbing stairs and walk without pain. Shortening of 2 cm was present and planned

for limb lengthening procedure in future; x-ray of her hip showed a viable head and neck shaft angle was 138°.

RESULTS

Two cases with neonatal septic arthritis presented with painless limping, limitation of hip abduction, limb length discrepancy and shortening of femur to the outpatient unit. Proximal Femoral Valgus osteotomy and bone grafting with fibular strut graft were performed. Follow up were done at 2nd, 6th, 10th months. At the last follow-up postoperative evaluation, these patients showed successful consolidation of non-union, correction of Trendelenburg gait, restored lower extremity alignment.

DISCUSSION

Septic arthritis remains a major infection causing morbidity and mortality. The metaphyseal and epiphyseal vessels anatomy in the hip during infancy predisposes to septic arthritis of hip. Septic arthritis of the hip in new born can progress to severe long-term sequelae due to direct damage in the articular cartilage or indirectly by damaging the physes. The main complications of septic arthritis in the hip are triradiate cartilage and capital femoral physis premature closure, dysplasia of acetabulum, avascular necrosis of the articular cartilage and head, femoral head damage and ankylosis of hip.

Out of late treatment of 31 children with residual deformity and five cases of Type IIIB are found with femoral neck malalignment with extreme ante version or retroversion of the femoral neck treated with Proximal femoral valgus osteotomy was performed in these children and adults with coxa vara and femoral neck non-union in a study by Choi et al.

In 21 patients with severe sequelae of the hip in a study by Wada et al and 2 out of 4 cases were treated by femoral valgus osteotomy and bone grafting. Metaphysis is the primary site of lesion and non-union at the metaphysis will ossify quickly due to right angled arrangement of epiphysis plate against the forces. Valgus osteotomy is a cost effective and easy to perform procedure which acts as a biological stimulus promoting osteogenesis as it converts shearing forces to compressive forces.

On resecting the lateral wedge, there is a chance of damaging the epiphyseal plate near Greater Trochanter and it is difficult to achieve rigid internal fixation in children. The action of the abductor muscles increases after lateralisation and distal displacement of the greater trochanter. The tip distance from great trochanter and hip centre increases when the superior end of the femur was placed against the pelvis on the lateral side leading to biomechanically stable

hip.

CONCLUSION

In this study, two cases with non-union of neck of femur following septic sequelae of hip were treated surgically with proximal valgus osteotomy and bone grafting with fibular strut graft showing quick ossification. Operative treatment for post septic sequelae with hip arthritis was attempted in two neonates and showed good results. Similar study in large groups for longer period of time will help in knowing the exact result of the procedure.

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