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Valgus osteotomy in management of non-union of inter-trochanteric fracture: A case report

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Abstract

Intertrochanteric fractures of the hip, in an elderly age group are common due to poor bone stock, where as in younger individuals, they often result from high velocity trauma such as fall from a height and road traffic accidents. Surgical options in the management of these fractures are abundant and the incidence of non-union or mal-union as a complication is low (around 1%). However, in developing countries with a pre-dominantly rural population, patients often present late with inadequately managed trochanteric fractures due to various factors such as-lack of affordability, lack of infra-structure and also traditional belief and availability of native bone setters. In such neglected cases, varus malunion or non-union is the most frequent biomechanical complication following inadequate treatment of unstable trochanteric fractures. The resulting Coxa vara presents with problems such as limb length discrepancy with shortening of affected limb, external rotation deformity with limitation of abduction and internal rotation, limp, and hip and back pain due to mechanical factors. Valgization osteotomy is therefore a decent surgical option that helps in re-establishing the biomechanical axis and the abductor lever arm of the affected limb. It also helps to redirect the force vector and consequently aids in the union of the fracture and the osteotomy itself. In the literature, there are only a few publications dealing with the results of Valgus Osteotomy in the treatment of complications of trochanteric fractures. Here we present a case report of a 65 years old male presented with conservatively managed non-consolidated fracture of the trans-trochanteric region of femur managed by valgization osteotomy.

Keywords: Intertrochanteric fractures, non-union, valgus osteotomy, coxa vara

Introduction

Recent epidemiological studies have suggested that the incidence of fractures of inter-trochanteric region of the femur has increased significantly in the recent decades and are one of the leading causes of morbidity and mortality particularly in the geriatric population [1]. Intertrochanteric fractures of the hip, in an elderly age group are common due to poor bone stock, where as in younger individuals, they often result from high velocity trauma such as fall from a height and road traffic accidents [2]. A plethora of surgical options are available in the management of these fractures and the incidence of non-consolidation as a complication of trans-trochanteric fractures is low (around 1%), and this is due to the excellent vascularization in this region [3]. However, in developing countries with a pre-dominantly rural population such as ours, patients do tend to present late for treatment due to various factors. Factors such as lack of affordability, lack of infra-structure and also traditional belief and availability of native bone setters make them go in for ineffective irrational conservative treatments options for weeks. In such neglected cases, excellent blood supply and cancellous bone in the inter-trochanteric region leads to mal-union of the fracture in the younger age group whereas in the aged geriatric population it can proceed to non-union [2, 4]. Varus malunion or non-union is the most frequent biomechanical complication following treatment of unstable trochanteric fractures. The resulting Coxa vara presents with problems such as limb length discrepancy with shortening of affected limb, external rotation deformity with limitation of abduction and internal rotation, limp, and hip and back pain due to mechanical factors. Valgization osteotomy is a therapeutic surgical option that has been found effective for treating consolidation failure of trans-trochanteric fractures of femur [1-3]. The osteotomy re-establishes the biomechanical axis and the abductor lever arm, redirects the force vector and consequently consolidates the fracture and the osteotomy itself [4]. In the literature, there are only a few publications dealing with the results of VITO in the treatment of complications of trochanteric fractures. Here we present a case report of a 65 years old male presented with conservatively managed non-consolidated fracture of the trans-trochanteric region of femur managed by valgization osteotomy [5].

Case Report

A 65 years old male presented in the Orthopaedics outpatient department with chief complaints of limp, inability to bear weight in left lower limb and occasional pain in the hip region. The patient gave a history of self-fall on the road following which the patient was unable to bear weight in the left lower limb along with pain in the groin region radiating to lateral aspect of thigh which was partially relieved on medication. The patient was taken to nearby outside hospital where X-Ray of the Pelvis in antero-posterior view revealed an inter-trochanteric fracture of the femur. The patient was put on splint and traction and was advised surgery at a later date but the patient was unavailable. The traction was removed after 3 months on a subsequent visit and the patient was asked to ambulate with help of crutches not bearing weight on the affected limb. The patient now presented in our out-patient department 6 months after that with limp, inability to bear weight in the affected limb and shortening.

On clinical Examination, the patient presented with assisted short limbed and Trendelenburg gait. ASIS of the left side at higher level compared to right. There was significant muscle wasting in the left thigh. The limb was flexed and externally rotated at hip, with prominence, broadening and irregularity over greater trochanter. Abduction, External rotation and extension at hip was restricted and movements were painful in all directions. There was true supra-trochanteric shortening of 3 cm with shortening of base of Bryant's triangle. The Harris hip score of the patient was 36.

Radiological evaluation included Pelvis with both hips Antero-posterior view and lateral view of the left hip with showed a non-united unstable fracture of the inter-trochanteric region of the femur with superior migration of the greater trochanter and varus deformity of the hip.



Fig 1: X-Ray Pelvis with both Hips showing varus non-union inter-trochanteric fracture of the femur

All the available treatment options were discussed with the patients and the benefits and cons of each were explained. Finally, the patient was planned for a valgization osteotomy. Routine pre-operative blood investigations were performed and pre-anaesthetic check-up was done. The surgery was

carried out on a radio-lucent table with fluoroscopic control. The patient was placed supine with a sandbag under the ipsilateral buttock. The fracture site and capsule were exposed using the Watson-Jones approach. A femoral osteotomy to achieve medial displacement of the shaft of the femur and a valgus position of the proximal fragment was done at the level of lesser trochanter. After removing the intermediate segment of the trochanter, the site of the non-union can be directly visualised and fibrous tissue excised from between the fracture fragments. A T-shaped capsulotomy exposes the inferior. Anterior and superior surfaces of the femoral neck and a rim of the femoral head below the acetabular labrum. Retractors maintain this view while 130-degree angled blade plate is introduced under direct vision into the centre of the fractured surface of the proximal fragment, going into the inferior part of the femoral head. Using the plate as a lever, and adducting the thigh, the calcar of the proximal fragment is wedged into the medullary canal of the distal fragment. The side plate is brought into contact with the lateral cortex of the femur and fixed with screws. Bone grafts taken from the excised wedge of the greater trochanter and iliac crest are placed around the osteotomy site, especially medially. The reduction is checked under fluoroscopy and found satisfactory. Incision was closed in layers. Anti-septic dressing done.



Fig 2: Immediate Post-operative X-ray showing Valgus Intertrochanteric osteotomy with angle blade plate insitu.

Post-operative non weight bearing ambulation was started on second post-operative day. Stitch removal was done after 2 weeks. Partial weight bearing was allowed at 6 weeks and full weight bearing at end of 8 weeks. Post-operative Harris hip score was improved to 75 at 4 weeks and 85 at 8 weeks.



Fig 3: X-ray of Valgus Intertrochanteric osteotomy with angle blade plate in situ at 4 weeks post-operative period

Discussion

Non-union of inter-trochanteric fracture and varus collapse forms a vicious cycle that complement each other [5]. Shear forces generated over the fracture site hinder fracture union. They result from the deforming forces on the fracture fragments that causes the proximal fragment to go into varus [2]. Resorption of the proximal fragment over and around the coxa vara contribute to additional shortening along with the mechanical disruption of the abductor lever arm [1, 2]. Prolonged immobilization in these geriatric patients make them prone to decubitus ulcers, muscle atrophy and disuse osteoporosis, hypostatic pneumonia and deep vein thrombosis. So, the goal of treatment in these cases should be achieving union, restoration of normal biomechanics and early mobilization of the patients. Valgus osteotomy re-establishes the biomechanical axis and the abductor lever arm, redirects the force vector and consequently consolidates the fracture and the osteotomy itself [1, 2, 4].

Conclusion

Valgus osteotomy with Osteotomy angle blade plate is an effective procedure in the management of malunited intertrochanteric fractures. It corrects the limb length discrepancy, restores the decreased neck shaft angle, improves range of movement, restores the integrity of the abductor mechanism of the hip and gives good functional results.

Conflict of Interest: Nil

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