

## Subtrochanteric Valgus osteotomy for Coxa Vara stabilized using contoured straight dynamic compression plate

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### Introduction

Coxa vara is defined as a femoral shaft angle of less than 110 degrees. It is due to a heterogeneous group of conditions which can be congenital, developmental, dysplastic, acquired and post traumatic. The condition may occur at the physis or in the trochanteric or subtrochanteric area.<sup>1</sup> Coxa vara in childhood is usually progressive, painful, unilateral, or associated with leg length discrepancy<sup>2</sup>. With the exception of some forms of developmental Coxa Vara which can resolve spontaneously, Valgus subtrochanteric osteotomy is the gold standard surgical treatment of developmental Coxa Vara. Nevertheless, there has been no consensus on the method of fixation and osteotomy. In the pediatric age group, there is no implant specifically designed for this purpose.<sup>3,4</sup> The results are best when the surgery is done before the age of nine years.<sup>5</sup>

### Case 1

M.A was a 7 year old boy who presented with a three year history of limp, pain and limb shortening of the left lower limb. The condition had continued to progress over the years. There was no history of swelling, deformity or abnormal movement in the limb and no history of trauma, fever or pain in other joints. At the onset of symptoms, the parents took him to a traditional bone setter where massage and scarification were done without any significant improvement.

The findings on examination at presentation were in the musculoskeletal system which revealed a short limb gait with a Tredenleburg component. There was a limb length discrepancy of 4cm with the left shorter than the right and a reduced range of motion in all directions. He was optimized and prepared for a subtrochanteric valgus osteotomy after an initial preoperative templating. The osteotomy was fixed with a 6 hole, 4.5mm plate which was contoured using hand held plate benders to 125 degrees. It was fixed with cortical screws,

2 holes proximally and 3 holes distally. Post operatively, the neck shaft angle was 120 degrees and the limb length discrepancy was 2cm. The Tredenleburg gait had also improved significantly.

### Case 2

B.O was a 14 year old girl who presented to the orthopedic clinic two years earlier with a two week history of sudden onset hip pain and an inability to bear weight on the right lower limb. There was no history of swelling, deformity or abnormal movement and she did not have any history of such in the contra lateral hip. There was no history of trauma or fever.

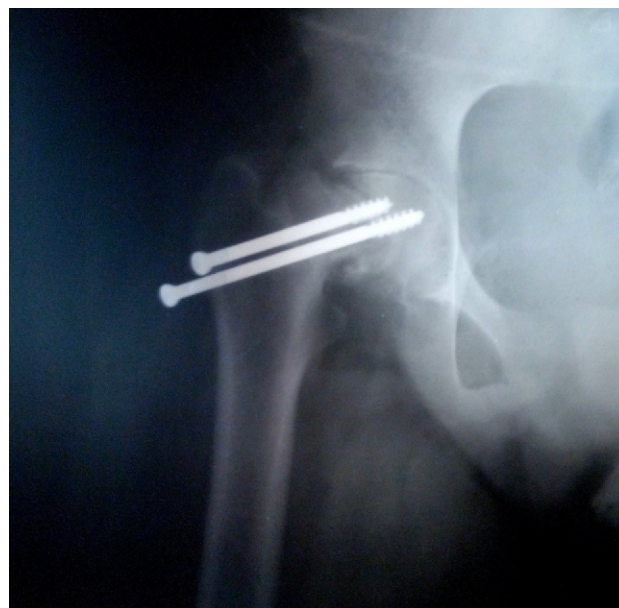


Figure 1; post in situ-pinning of the SCFE

Examination revealed an obese girl in a good state of health who was walking with the aid of bilateral axillary crutches. Radiological Investigation confirmed a severe slip capital femoral epiphysis (SCFE). She was also big for age. She was prepared for and had an in situ pinning using two 6.5mm cancellous screws using the direct lateral approach (Figure 1). Postoperatively, she was placed on gradual weight bearing. However she had residual limb length discrepancy and pain and could not bear full weight on the affected limb.

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Figure 2 post-operative x-ray (valgus osteotomy and stabilization with a contoured straight plate)

Repeat x-ray showed fusion of the upper femoral capital epiphysis and a femoral neck shaft angle of 95 degrees. She was counselled for removal of screws and subtrochanteric valgus osteotomy. She was optimized and a subtrochanteric osteotomy was done after an initial preoperative templating and planning. It was fixed with a contoured straight plate. Post operatively the limb length discrepancy was 1cm and range of motion and Tredenleburg gait improved.

### Discussion

Coxa Vara is a rare condition of the femoral shaft which is found in children. Developmental Coxa Vara is a hip deformity characterized by a defect in endochondral ossification of the medial portion of the femoral neck, together with progressive vertical inclination of proximal femoral physal plate and shortening, and a decrease of neck shaft angle.<sup>1</sup> Almost all cases require surgical procedures to correct the deformity,<sup>2,5</sup> however there is no definitive implant to fix the osteotomy. The implants that have been used include external fixators, internal

fixation with pins and cerclage and a variety of plates.<sup>4</sup> Any form of fixation used must be rigid and stable and should allow early weight bearing without any displacement of the osteotomy up to the time of union and must preclude use of any secondary supportive device such as a Hip Spica.<sup>4,6,7</sup> Even with a well performed osteotomy, the recurrence rate is still high with ranges from 30-70%.<sup>2</sup> However, if the proximal femur was corrected and maintained before 10 years of age, 83% of children have excellent acetabula depth, spherical congruency, relief from pain, and correction of Tredenleburg gait.<sup>6,8-10</sup> Even though in the second case she was 14 years at the time of surgery, which is within the age range during which SCFE tend to occur.

### Conclusion

The internal fixation of subtrochanteric valgus osteotomy using a contoured dynamic compression plate allows early mobilization of the child without any need for a postoperative splinting.

### References

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