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SALVAGING UNSTABLE HIP WITH PELVIC SUPPORT OSTEOTOMY

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ABSTRACT

The pelvic support osteotomy is a useful surgical procedure for the salvage of unstable hips of patients in whom arthrodesis or hip arthroplasty are not appropriate & have much to offer in adolescent or young adults with painful limp, restriction of hip range of motion and early onset fatigue while walking as a consequence of destructed Hip. We present a case where femoral pelvic support osteotomy significantly relieved abductor lurch,shortening & Pain.

KEYWORDS : Abductor Lurch, PSO, Pelvic Support Osteotomy, Painful Limp, Shortening, Femoral Shortening

The pelvic support osteotomy is a useful surgical procedure for the salvage of unstable hips of patients in whom arthrodesis or hip arthroplasty are not appropriate (Dimitrios and Selvadurai, 2008). It is a procedure that has much to offer to adolescent or young adults who has painful limp, restriction of hip range of motion and early onset fatigue while walking as a consequence of hip destruction.We are presenting a case of femoral pelvic support osteotomy done in destructed hip, to relieve pain and to eliminate abductor lurch. Various variations of different osteotomy techniques mentioned in literature are used as per required correction of lurch and shortening to relieve pain. stable fixation and required valgus correction can be achieved with precise pre-operative planning and accurate surgical procedure. As patients are young, osteotomy usually heals and union is achieved in about 6 weeks and these procedures are also helpful in eliminating trendelenburg gait and to some extent lengthening is possible. We present a case of young female with 4 years old girdle stone excision arthroplasty operated with femoral pelvic support osteotomy to relieve pain, abductor lurch and shortening.

CASE REPORT

A 23 year old female k/c/o ss pattern sickle cell disease presented as previously operated case of Excision Arthroplasty of left hip 4 years back for Avascular necrosis of femur head (Ficat & Arlet Stage IV). Patient had pain in left hip with difficulty in sitting, squatting, prolonged standing and significant trendelenburg lurch since 1 year. On physical examination, trendelenburg sign was positive and there was true shortening of 4cm as compared to right side (Figure 1 A and B). With painful range of motion painful. Pre-operative flexion arc was 400, rotational arc was 250 and abduction before operation was 150. She was severely disabled in performing day to day activities.

Surgical Procedure

a. Planning

Pre-op X-rays of pelvis with both hips with affected lower limb in full adduction are taken to calculate amount of valgus to be achieved . The size of the valgus correction at the proximal femoral osteotomy is the sum of the adduction contracture and the amount of maximum adduction. Several authors have also recommended overcorrection at this osteotomy level, varying from 150 (Inan and Bowen, 2005) to 250 (Choi, 2005). The size of overcorrection is in anticipation of remodeling at the valgus osteotomy and some atrophy of the interposed soft tissue between femur and lateral wall of pelvis.

b. Level of osteotomy

When the femoral shaft is fully adducted against the lateral wall of the pelvis, an AP X-ray of the pelvis gives a projection of abutment (as opposed to actual contact as we are dealing with two dimensions on X-ray) and this depicts the level of the proximal osteotomy. This level can vary depending on the resting position of the femur in relation to the pelvis, in other scenarios the level of proposed osteotomy lies coincident with part of the projection of the ischial tuberosity (Dimitrios and Selvadurai, 2008).

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Figure 1 A : Preoperative Radiograph Demarcating Level of Pelvic Support Osteotomy and Angle of Correction

Figure 1B : Radiograph Showing Full Adduction View of Pelvis

c. Procedure

Procedure is performed on fracture table in supine position through lateral approach to left proximal femur. Subperiosteal detachment of vastus lateralis muscle done and osteotomy site is marked at the level of ischial tuberosity which is approximately 8-10 cm distal to vastus

Figure 2 : Intra Operative Picture Showing Osteotomy is Securely Fixed With 9 Holes Pre-Contoured (30^0 Valgus Angle) Non Locking Dynamic Compression Plate (DCP) and Cortical Screws.

ridge. Transverse osteotomy performed and distal fragment is medialised. Edge of proximal fragment engaged into distal fragment and approximately 300 of valgus correction done at osteotomy site is achieved. Osteotomy is securely fixed with 9 holes pre-contoured (300 valgus angle) dynamic compressive plate(DCP) and cortical screws (Figure 2). Re-attachment of vastus lateralis muscle over the plate done.

RESULT

Postoperatively after 12 weeks of surgery Osteotomy healed completely (Figure 3 A and B) and patient's left lower limb was well aligned with the axis aligned under the medial wall of the acetabulum with complete pain relief (Figure 4). Trendelenburg gait was eliminated & her leg lengths were brought within an acceptable range with reduction of post-operative true shortening from 4cm to 1cm (Figure 5). Range of Motion of left hip was improved with flexion 80^0 and abduction 30^0. Harris Hip Score had improved from 50 pts to 72 pts at 12 weeks follow-up. Recent studies support the findings of sufficient correction and stable fixation after proximal femoral osteotomy.

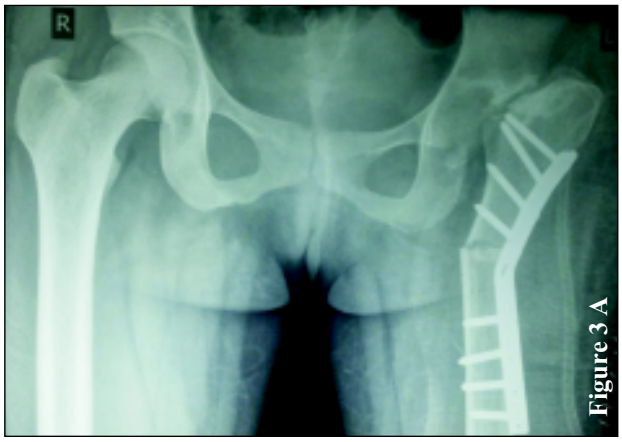

Figure 3A and 3B : Postoperative Radiograph After 12 Weeks of Surgery Showing Completely Healed Osteotomy

Figure 4 : Postoperative Radiograph Showing Patient's Left Lower Limb Axis Well Aligned Under the Medial Wall of the Acetabulum

Figure 5 : Clinical Picture Showing Reduction of Post-Operative True Shortening From 4 cm to Just 1 cm

DISCUSSION

The term pelvic support is attributed to Lance who, in 1936, used it in reference to subtrochanteric osteotomies for the treatment of congenital dislocation of the hip (Lance,1936).Variations of the procedure had been

described by Milch pre-dating 1936. The techniques by Lorenz (Lorenz, 1919), Schanz (Schanz,1922) and Ilizarov (Ilizarov and Samchukow,1988) deserve special mention. The subtrochanteric osteotomy designed by Lorenz was a valgus osteotomy coupled to a medial and proximal displacement of the shaft of femur. In contrast, the Schanz osteotomy was performed by introducing a valgus, and sometimes extension, position to the distal femoral segment but without the proximal displacement of the Lorenz procedure.In patients with girdle stone excision arthroplasty stable fixation and required valgus correction can be achieved with precise pre-operative planning and accurate surgical procedure. Osteotomy usually heals and union is achieved in about 6 weeks in young patients and eliminate trendelenburg gait and to some extent lengthening is achieved. The aim in the treatment of patient with hip instability is to overcome hip pain, limb length inequality, limp with improved range of motion of the hip and thus restoring hip stability whilst preserving the biomechanical alignment of the extremity(Sarper, 2011). Choi et al (Choi et al., 2005) reported that pelvic support osteotomy was a more effective treatment, especially in patients with a destructed femoral head and neck.

One of the main objectives of pelvic support osteotomy is to correct the Trendelenburg gait. Inan et al (Inan and Bowen, 2005) emphasized that correction of Trendelenburg sign depends on the age at the time of operation and the volume of the gluteus medius muscle. Pelvic support osteotomy is usually preferred in young adulthood where active life expectancy is longer. (Berry, 1999). The preoperative considerations involve a careful clinical and radiological assessment together with a discussion of alternative surgical solutions. Surgical planning is based on data obtained from clinical and X-ray assessment; both will provide the surgeon with answers to: (a) the level of the proximal osteotomy (b) the amount of valgus required at the proximal osteotomy.Complication rates are low with PSO.

CONCLUSION

In young patients pelvic support osteotomy (PSO) successfully relieves pain,lurch,corrects Trendelenburg gait,simultaneously restore knee alignment, corrects lower-extremity length discrepancy with excellent remodeling of osteotomy site.

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