Received: 2016.12.11
Accepted: 2017.02.02
Published: 2017.04.23

ISSN 1941-5923
© Am J Case Rep, 2017; 18: 440-443
DOI: 10.12659/AJCR.902784

Management of Coxa Vara Septica and Pseudoarthrosis of the Femoral Neck: A Case Report

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

AE 1 **Hasime Qorraj Bytyqi**
BE 2 **Cen Bytyqi**

1 Department of Orthopaedics and Traumatology, Faculty of Medicine, University Clinical Center of Kosovo, University of Prishtina, Prishtina, Kosovo
2 Department of Orthopaedics, Faculty of Medicine, University Clinical Center of Kosovo, University of Prishtina, Prishtina, Kosovo

Corresponding Author: Hasime Qorraj Bytyqi, e-mail: hqorraj@hotmail.com
Conflict of interest: None declared

Patient: Female, 12
Final Diagnosis: Coxa vara and pseudoarthrosis of the femoral neck
Symptoms: Limp
Medication: —
Clinical Procedure: —
Specialty: Orthopedics and Traumatology

Objective: Unusual or unexpected effect of treatment

Background: Coxa vara and pseudoarthrosis of the femoral neck after septic hip arthritis is a very rare disease. The aim of this study was to present a case with pseudoarthrosis of the femoral neck, with coxa vara after neonatal septic arthritis of the right hip, and treatment of the pseudoarthrosis with proximal femoral valgus osteotomy.

Case Report: A 12-month-old female, who had suffered neonatal septic arthritis with a five-day history of fever and painful right hip now demonstrated painless limping to the right hip, pelvic obliquity, Trendelenburg-Duchenne gait, limitation of hip abduction, lower-extremity length discrepancy with 3.0 cm of shortening of right femur, and walking on her tiptoes. In addition, a viable femoral head, coxa vara, and pseudoarthrosis of the femoral neck were observed. At the age of 26-months, the patient had a realignment valgus osteotomy of the proximal femur and adductor tenotomy was performed. At the last follow-up postoperative evaluation, at the age of four and a half years, the patient showed successful consolidation of pseudoarthrosis, correction of Trendelenburg gait, restored right lower extremity alignment, and corrected lower-extremity length discrepancy.

Conclusions: In the case of coxa vara and pseudoarthrosis of the femoral neck, realignment of the proximal femoral valgus osteotomy and bone grafting of the pseudoarthrosis resulted in ossification of the femoral neck as the epiphyseal plate was placed at right angle to the compressive forces.

MeSH Keywords: Coxa Vara • Osteotomy • Pseudoarthrosis

Full-text PDF: <http://www.amjcaserep.com/abstract/index/idArt/902784>

1255 — 2 6

Background

Delay or missed diagnosis and treatment of septic arthritis of the hip may result in a spectrum of various pathologic changes. Late sequelae of infantile septic arthritis and osteomyelitis of the hip are diverse and can include premature closure of the triradiate cartilage, acetabular dysplasia, lower-extremity length discrepancy, premature or asymmetrical closure of the capital femoral physis, necrosis of the articular cartilage, osteonecrosis, pseudoarthrosis of the femoral neck, hip dislocation, hip ankylosis, and complete destruction of the femoral head and neck [1–3].

Pseudoarthrosis of the femoral neck after septic arthritis of the hip resulting in coxa vara is a very rare disease and there are only a few similar cases reported at the literature [3,4]. Surgical treatment for severe sequelae, however, should be regarded as a measure that improves clinical function and delays the more definitive procedures that are reserved for adult patients.

We present a rare case of a two years old female with sequelae of hip septic arthritis (Choi Type IIIB, Johari Group V) that developed pseudoarthrosis of the neck of femur and coxa vara. The purpose of this study was to report on the utility of valgus osteotomy of the proximal femur and adductor tenotomy in the treatment of sequelae of infantile hip septic arthritis.

Case Report

A 12-month-old Caucasian female was referred to our department because of painless limping to the right hip and walking on tiptoe. She was born premature at 32 weeks gestation via vaginal delivery, with a low birth weight less than 1.5 kg (1.4 kg). She was treated in the Neonatal Intensive Care Unit (NICU) with parenteral antibiotics for a neonatal sepsis at the age of five-days-old, but the local right hip septic arthritis was overlooked so no surgical drainage or ultrasound-guided repeated aspiration was done. At presentation she demonstrated: pelvic obliquity, Trendelenburg-Duchenne gait, limited right hip abduction to 25°, internal rotation to 15°, lower-extremity length discrepancy with 3.0 cm of shortening of right femur. Plain anteroposterior radiographs demonstrated a viable femoral head, decreased neck-shaft angle of the affected hip of 96°, relative overgrowth of greater trochanter with proximally migration, shortening of femoral neck, with severe coxa vara with femoral neck pseudoarthrosis and vertical orientation of the capital physis (Figure 1). Preoperative value of Hilgenreiner-epiphyseal angle in our case was 75°. The radiographic findings correspond to Choi Type IIIB at the classification of Choi et al. and as Group V using Johari classification for pseudoarthrosis of femoral neck-stable [5]. The patient, at the age of 26 months, received proximal femoral valgus

osteotomy and adductor tenotomy. The adductor soft tissue was released, followed by correction of the neck shaft angle from 96° to 136°. We used a lateral approach and subperiosteal detachment of the vastus lateralis muscle. A closing wedge valgus osteotomy was carried out using a 130° angled blade plate for internal fixation. The straight blade plate was bent to 130° in order to achieve the desired correction and stability without the need for postoperative plaster immobilization. Postoperative management consisted of partial weight bearing for four to six weeks. Postoperative evaluation showed successful correction of her Trendelenburg gait, restored right lower extremity alignment, and corrected lower-extremity length discrepancy. With this intertrochanteric osteotomy of valgisation of 40°, the neck-shaft angle changed from 96° preoperatively to 136° postoperatively. We also achieved the transfer of the greater trochanter distally and laterally so it was level with the center of the femoral head, restoring normal tension to the pelvitrochanteric muscles and improving their mechanical efficiency. The Hilgenreiner-epiphyseal angle postoperatively was 35°. The acetabular depth improved significantly one year post-operation from 30° preoperatively to 24° postoperatively. Seventeen months after the operation, the consolidation of the osteotomy was completed and the hardware was removed. At the last follow-up, at the age of four and a half years, she had no hip pain, better hip range of motion, and she had 100° flexion, 10° extension, abduction 40°, adduction 45°, and internal rotation 30° and external rotation of 45°, no difficulties with recreational activities, and the osteotomy had healed. She was able to squat, run, climb stairs, and walk without an obvious limp. There was no pain in her hip. Shortening was reduced from 3 cm to 0.5 cm; x-ray of her hip showed a relatively well formed head with neck shaft angle of 136° with union of the previous pseudoarthrosis (Figure 2).

Discussion

Septic arthritis remains an important infection and is associated with significant mortality and morbidity. The unique communication of metaphyseal and epiphyseal vessels in the hip during infancy makes hip septic arthritis the most frequently involved site with the poorest outcomes.

Septic arthritis of the hip in the newborn can result in severe long-term sequelae due to direct damage of the articular cartilage or indirectly by physeal damage and avascular necrosis.

The main complications of septic arthritis in the hip include limb deformity secondary to avascular necrosis femoral head/neck, pseudoarthrosis of femoral neck, premature closure proximal femoral epiphysis, dislocation, and overgrowth of greater trochanter [2].

Figure 1. Case study: radiographic appearance of the right hip of a premature infant with severe coxa vara septica with non-union. (A) at one year of age, (B) at 18 months of age, and (C, D) at two years and two months of age. The right femoral neck is irregularly shorter with varus deformity, pseudoarthrosis of femoral neck with viable head, and the growth plate of the capital physis is tilted to a near vertical orientation.

Choi et al. evaluated the residual deformity and late treatment of 34 hips of 31 children who had septic arthritis when they were less than one-year-old. They found only five hips of Type IIIB, which involved malalignment of the femoral neck with extreme anteversion or retroversion, or with a pseudoarthrosis (only one) of the femoral neck [3]. Proximal femoral valgus osteotomy in coxa vara septica in combination with femoral neck pseudoarthrosis is the most important reconstructive surgery in the hip region in children and adolescents [6,7]. Wada et al. reviewed the results of operative reconstruction of 21 hips in 21 patients with severe sequelae due to infantile septic arthritis of the hip. They reported only two of the four Type IIIB hips treated by femoral valgus osteotomy and/or

bone grafting had successful outcomes [5]. The basic lesion of coxa vara septica and pseudoarthrosis is in the metaphysis. Pseudoarthrosis in the metaphysis will ossify as soon as the epiphyseal plate is placed at right angles to the resultant compressive forces. Valgus osteotomy acts as a biological stimulus for the healing of neck pseudoarthrosis, promoting osteogenesis as a result of conversion of shearing forces to compressive forces across the pseudoarthrosis site. The osteotomy is relatively easy to perform, cost effective, and provides good stability. Pseudoarthrosis and coxa vara can be corrected simultaneously [6]. In small children, it is somewhat difficult to achieve stable internal fixation. When the lateral wedge is resected, there is the distinct danger of damaging the epiphyseal

Figure 2. Radiographs of the pelvis: (A) immediately postoperatively (at two years and two months); (B) at one year after valgus intertrochanteric osteotomy restoring the shaft-neck angle and consolidation of the pseudoarthrosis of the femoral neck; (C) at age of four years and six months no signs of premature closure of the proximal femoral growth plate and triradiate cartilage plate.

plate of the greater trochanter. With proximal femoral valgus osteotomy, the greater trochanter is lateralized and distally displaced, so the action of the abductor muscles is increased.

We placed the superior end of the femur against the lateral aspect of the pelvis and also increased the distance between the top of the great trochanter and the center of the hip rotation; we also achieved, biomechanically, a stable congruent hip.

Conclusions

This case report describes a rare case of a coxa vara septica with pseudoarthrosis of femoral neck as a sequelae of neonatal

septic hip arthritis treated with proximal valgus osteotomy. Realignment of the proximal femoral valgus osteotomy and bone grafting of the pseudoarthrosis allowed the metaphysis of the femoral neck to ossify quickly as the epiphyseal plate was placed at a right angle to the resultant compressive forces. Operative treatment of sequelae of neonatal septic arthritis of the hip can successfully correct a Trendelenburg gait, restore alignment, and correct lower-extremity length discrepancy.

Conflict of interest

The authors did not have financial support or any conflict of interest.

References:

1. Perlman MH, Patzakis MJ, Kumar PJ, Holtom P: The incidence of joint involvement with adjacent osteomyelitis in pediatric patients. *J Pediatr Orthop*, 2000; 20: 40–43
2. Buxton R, Moran M: Septic arthritis of the hip in the infant and young child. *Curr Orthop*, 2003; 890: 458–64
3. Choi IH, Shin YW, Chung CY et al: Surgical treatment of the severe sequelae of infantile septic arthritis of the hip. *Clin Orthop Relat Res*, 2005; (434): 102–9
4. Betz RR, Cooperman DR, Wopperer JM et al: Late sequelae of septic arthritis of the hip in infancy and childhood. *J Pediatr Orthop*, 1990; 10: 365–72
5. Wada A, Fujii T, Takamura K et al: Operative reconstruction of the severe sequelae of infantile septic arthritis of the hip. *J Pediatr Orthop*, 2007; 27: 910–14
6. M'sabah L, Assi C, Cottalorda J: Proximal femoral osteotomies in children. *Orthop Traumatol Surg Res*, 2013; 99: 171–86