ORIGINAL ARTICLE

Evaluation of the Results of Open Reduction, Capsulorraphy and Femoral Derotational Osteotomy in Walking Age Children with Developmental Dysplasia of Hip with Late Presentation

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ABSTRACT

Objective: To evaluate the results of open reduction, capsulorraphy and femoral derotational osteotomy with shortening in walking age children suffering from developmental dysplasia of hip with late presentation.

Study design: A prospective study.

Place: Department of Orthopedics, Lady Reading Hospital Peshawar.

Duration of study: From Jan 2004 to Jan 2010.

Patients and methods: Twenty three hips presented in 22 patients with developmental dysplasia of hip in walking age children ranging from 30 months to 70 months who were treated with open reduction, capsulorraphy and femoral derotational osteotomy with or without shortening. All patients were kept in hip spica for 12 weeks followed by abduction splint for three months.

Results: Result shows that 20 out of 23 hips had excellent outcome and they remained reduced throughout their follow up. Two out of 23 hips redislocated. One child went into avascular necrosis.

Conclusion: we concluded that open reduction, capsulorraphy and femoral derotational osteotomy with shortening is an effective method of treatment of late presented developmental dysplasia of hip in walking age children.

Key Words: Developmental dysplasia of hip, open reduction, capsulorraphy and femoral derotational osteotomy.

INTRODUCTION

Developmental dysplasia of the hip (DDH), previously known as congenital dislocation of the hip is a spectrum[1] of diseases, common and well-documented condition primarily detected in neonates[2]. The term developmental is now preferred to congenital because it is more encompassing as it is taken in the literal sense of organ growth and differentiation, which includes fetal, neonatal, and infantile periods. This terminology includes all cases that are clearly teratological and those that are developmental, and it incorporates dysplasia of the hip, subluxation, and dislocation[3]. Its prevalence of established dislocation of the hip in an unscreened population varies from 0.7 -1.6/1000 children in European and American white population[4].

Hip instability is the main abnormality which affects both acetabular and femoral development[2]. It is either an unstable hip, where the femoral head is though well centered, but displaces when force is applied, to the fully dislocated hip[5]. It has complex etiology, although it is more prevalent among first children, girls, those with a positive family history, and infants who had breech presentation[5-7].

DDH may even fail to be detected in early stage until the child reaches to walking age and leads to painful crippling degenerative arthritis of the hip in later age. Despite diagnostic and treatment advances in its management, developmental dysplasia of the hip is one of the most important congenital abnormalities of musculoskeletal system which remains controversial, confusing and challengeable among orthopeadic surgeons[8]. Due to lack of screening programs in this part of the world, most of the children are continued to present with this disease in older age[9]. The principles of treatment of older child with dislocated hip are quite different from that of a neonate [10]. As the patient leads to walking age and beyond, treatment becomes problematic and controversial[8,11,12]. This is because contractures of the capsule and musculotendinous structures surrounding the hip joint prevent reduction of the femoral head into the acetabulum,

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and may produce pressure on the femoral head during or after reduction, leading to ischaemia.[13-15] Left untreated these dysplastic changes lead to osteoarthritis in early adulthood.[18]

In children older than 6 months, achieving a concentrically reduced hip will minimizing complications is more challenging. Bracing, traction, closed reduction, open reduction, and femoral or pelvic osteotomies are frequently used treatment modalities for children aged 6 months to 4 years. In the past, treatment recommendations have often been based on the patient's age. However, recent practice has placed more emphasis on addressing the specific disorder and avoiding iatrogenic osteonecrosis. The incidence of osteonecrosis of the femoral head has been reduced by avoiding immobilization of the hip in extreme abduction and by using femur-shortening osteotomies when appropriate[16].

There is inconsistent data available to support that applying traction before reduction of a dislocated hip will reduce the prevalence of femoral head ischaemia[8, 11, 18]. Femoral shortening has been used to facilitate reduction and reduces the risk of osteonecrosis.[12, 21, 22] Combination of open reduction femoral shortening and varus derotational osteotomy is now a well established practice in neglected congenital dislocation of the hip. It avoids the need for prolonged pre-operative traction, femoral shortening prevent excessive pressure on the femoral head which may predispose to avascular necrosis[23-27]. Many authors have reported success with a single-stage procedure consisting of open reduction, capsulorrhaphy, femoral shortening and pelvic osteotomy.[28-32] We aim to evaluate the results of open reduction, capsulorraphy and femoral derotational osteotomy with shortening in 22 patients (23 hips) in walking age children with delayed diagnosis of DDH who were treated at our hospital and clinic.

PATIENTS AND METHODS

Twenty three hips (22 patients) meeting inclusion criteria of developmental dysplasia of hip in early walking age were recruited to orthopaedic unit Lady Reading Hospital Peshawar from Jan 2004 to Jan 2011 for open reduction, capsulorraphy and femoral derotational osteotomy with shortening. Informed consent was taken from all the patients. Pre operative skin traction was applied for 2 weeks. Patients were operated under general anesthesia in supine position with a small sandbag under effected hip. A pre-operative antibiotic (3rd generation cephalosporin) was given. Hip joint was approached through modified Somerville procedure. Capsule was carefully dissected from the abductor muscles and opened in a T-shape manner. Decision of open reduction, capsulorraphy and femoral derotational osteotomy was taken when Hip was stable in internal rotation and abduction (H. G. Zadeh et al)[33]. Ligamentum teres excised and multiple transverse cuts made in transverse acetabular ligament. Femoral derotation and shortening was carried out through a separate incision. Osteotomized bones were fixed with 4-6 holes 3.5mm DCP with 15^0 external rotation to correct the excessive anteversion of neck of the femur. Capsule which was incised initially in T-shape manner was carefully repaired with one layer falling over the other layer. Wound was closed and Patients were immobilized in hip spica with hip in 90^0flexion, 55^0 abduction and knee in 90^0flexion for 12 weeks. Check radiograph of the hip was taken every month to confirm the position of the hip. Patients were readmitted as a day case for removal hip spica after 12 weeks followed by application of abduction splint for 3 months. Patients were re admitted for removal of plate at 1 year after unions of the bones. All the patients were followed for up to 2 years.

All the patients were followed up to 3 months, 6 months and 1 year. They were assessed clinically as well as radiologically and complications were noted. Statistical program for social sciences (SPSS) version 16 was used to analyze the data.

RESULTS

In this study out of 23 hips (22 patients), 4 were male (18.1%) and 18 were female (81.18%) (Fig.1). Mean age was 48.1 months. Twelve patients had right side (54.54%), 9 patients had left side (40.9%) while one patient 4.54%) had bilateral DDH. (Fig 2). As for as complications are concerned, 2 patients(8.69%) developed redislocation of hip joint, one after 4 weeks and another one after 6 months. The previous one was managed by hip spica under image intensifier and relocated while the later one was considered for re surgery and innominate osteotomy. One patient developed avascular necrosis of femoral head.

In early period of walking after surgery, we noticed a slight external rotation of foot during walking which eliminated during follow up of 1-2 years.

We lost 3 patients for follow up after six months and their results were accepted at the time of their last follow up.

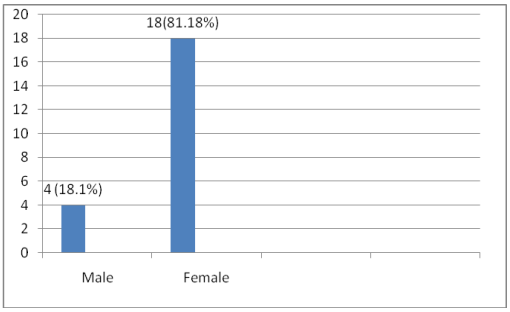

Figure 1: The distribution of patients in sex

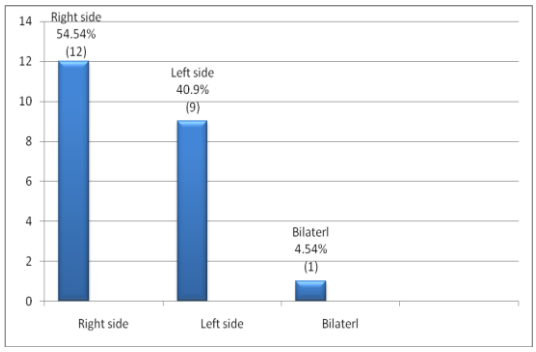

Figure2: The distribution of patients by the side effected

DISCUSSION

There is no established single method for the treatment of DDH. In our set up, unfortunately, we face with delayed presentation of DDH because of low socioeconomic status, lack of awareness and practically there is no screening program in this part of the world. Due to poor registration, their compliance and their procedures, we do not have any factual data regarding the prevalence, management and results of DDH. In the present study, we just want to present and have the results of only those cases which we have undergone through open reduction, capsulorraphy and femoral derotational osteotomy with or without shortening. As it is shown in our study, majority of cases are presented after the walking age. It is very difficult to educate the patients and their relatives for post operative follow up. Keeping all these difficulties in view, we think that our results are compatible with national and international results of such a difficult and controversial anomaly.

CONCLUSION

Open reduction of hip joint, capsulorraphy and femoral derotational osteotomy with femoral shortening is a recommended procedure for the management of developmental dysplasia of hip in older children with late presentation.

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