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Idiopathic hypertonicity as a cause of stiffness after surgery for developmental dysplasia of the hip



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ABSTRACT

INTRODUCTION: There are various complications reported with surgical treatment of DDH. Most studied complication is avascular necrosis of the femoral head and hip stiffness. The purpose of this report was to describe a case with severe stiffness of the hip due to hypertonicity in periarticular muscles after it was treated for developmental dysplasia of the hip (DDH).

PRESENTATION OF CASE: Three-year-old patient referred to our institution with bilateral DDH. Two hips were operated separately in one year with anterior open reduction, femoral shortening osteotomy. Third month after last surgery, limited right hip range of motion and limb length discrepancy identified. Clinical examination revealed that patient had limited range of motion (ROM) in the right hip and compensated this with pelvis obliquity. Gluteus medius, sartorius and iliofemoral band release performed after examination under general anesthesia. Symptoms were persisted at 3rd week control and examination of the patient in general anesthesia revealed full ROM without increased tension. For the identified hypertonicity, ultrasound guided 100 IU botulinum toxin A injection performed to abductor group and iliopsoas muscles. Fifth month later, no flexor or abductor tension observed, and there was no pelvic obliquity.

DISCUSSION: Stiffness as a complication is rare and is usually resolved without treatment or simple physical therapy. Usually it is related with immobilization or surgery associated joint contracture, and spontaneous recovery reported. Presented case is diagnosed as hip stiffness due to underlying local hypertonicity. That is resolved with anesthesia and it was treated after using botulinum toxin A injection.

CONCLUSION: Hypertonicity with hip stiffness after surgical treatment of DDH differ from spontaneous recovering hip range of motion limitation and treatment can only be achieved by reduction of the muscle hypertonicity by neuromuscular junction blockage.

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1. Introduction

The goals in the treatment of children with developmental dysplasia of the hip (DDH) are concentric reduction and maintenance of the reduction in order to provide the optimum environment for the development of femoral head and acetabulum.^{1–7} Conservative treatment modalities such as Pavlik harness and abduction orthosis have high success rates in infants.^{6,7} But older children with DDH are more difficult to treat. Treatment modalities include open reduction with or without femoral and pelvic osteotomies.^{8–11} In the neglected cases, open reduction combined with femoral

shortening osteotomy alone is not enough and we prefer acetabuloplasty to stabilize the reduced hip. Various acetabuloplasty techniques can redirect, reshape or augment the acetabulum. Good results have been reported with all acetabuloplasty techniques.^{8,9,12} But Pemberton and Dega procedures have the advantage of producing an immediate improvement in the shape of the acetabulum.^{13–15}

In all series reporting good results and function, the authors report complications such as avascular necrosis and redislocation in a very small number of cases.^{2–17} Some authors report hip stiffness after the operative procedure.^{8,11,12} Stiffness as a complication is rare and is usually resolved without treatment. The purpose of this report was to describe a case with severe stiffness of the hip due to hypertonicity in periarticular muscles after it was treated for DDH.

2. Case report

Three-year-old patient referred to our institution with bilateral DDH (Fig. 1), and left hip treated with adductor tenotomy, anterior

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Fig. 1. Three-year-old patient referred to our institution with bilateral DDH (according to Tönnis classification, left hip is grade 4 and right hip is grade 3).

open reduction, femoral shortening osteotomy initially. Reduction was preserved in pelvipedal cast for six weeks, and abduction orthosis for 6 weeks more after. Patient was followed with Trevor et al.'s evaluation criteria.¹⁸ One year after the first intervention right hip treated with anterior open reduction, femoral shortening osteotomy and Dega acetabuloplasty. As after the first surgery, reduction was preserved with pelvipedal cast for 8 weeks and abduction orthosis for 6 weeks (Fig. 2).

Third month after surgery, limited right hip range of motion and limb length discrepancy identified. Clinical examination revealed that, patient had a very limited range of motion, compensating this deformity with pelvis obliquity. There were twenty degrees of flexion contracture in the right hip. In the control X-ray there was concentric reduction in both hips (Fig. 3A). Full time extremity traction had started, but failed to get any clinical improvement. Patient examined under general anesthesia. Due to increased flexor and abductor tension, a gluteus medius, sartorius and iliofemoral band release had performed and increased hip range of motion obtained postoperatively. Abductor and flexor stretching physiotherapy postoperatively was applied to preserve motion. Patient was followed in outpatient clinic and at 3rd week control, both abduction and flexion contracture of the patient relapsed despite adequate physiotherapy. Patient had examined under general anesthesia again, and full range of motion without increased tension had observed in physical examination. For the identified hypertonicity, ultrasound guided 100 IU botulinum toxin A injection had performed to abductor group and iliopsoas muscles. After injection, night traction and day stretching exercises carried on. Fifth



Fig. 2. Early postoperative X-ray after anterior open reduction, femoral shortening osteotomy and Dega acetabuloplasty of right hip.



Fig. 3. X-ray at postoperative 3rd month, limited right hip range of motion and limb length discrepancy identified.



Fig. 4. Fifth month after Botulinum injection, no flexor or abductor tension observed, and there was no pelvic obliquity.

month later, no flexor or abductor tension observed, and there was no pelvic obliquity (Fig. 4). Her neurologic examination was normal without any spastic muscle tightness except hip and neurologic developmental has been normal. Range of motions is noted as 90° of hip flexion, 25° of internal and external rotation, 10° of adduction and 30° of abduction. Patient was operated with Dega acetabuloplasty for acetabular dysplasia of the contralateral side. At final follow-up patient had no complaint with hip (Fig. 5).

3. Discussion

It is clear that conservative treatment of DDH leads to successful treatment for younger patients, however conservative treatment methods tend to fail for late diagnosed cases and surgery become unavoidable. With increased age, morbidity of

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