



Case Report: A Novel Technique in Total Hip Replacement in Severe Adult Congenital Hip Dysplasia

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ABSTRACT

Hip dysplasia is a congenital defect of the hip joint in infants with mismatch of the femoral head and the acetabulum. It can be treated in infants via conservative or surgical containment of the femoral head. In developing countries cases of hip dysplasia are often overlooked and neglected. Therefore, many cases of severe coxarthrosis with dislocations of the femoral head can be observed. The dislocation complicates the implantation of a hip prosthesis. This article shows a novel technique in total hip replacement in a case report.

Keywords: Hip prosthesis, hip dysplasia, acetabulum, cup, femoral head

1. Introduction

In countries often referred to as the “western world” infants are usually screened for hip dysplasia. The screening method includes physical examination and an ultrasound examination of both hips (1). In the ultrasound picture the anatomy of the hip is classified by Graf. (2) In many countries of the so-called “developing world” those screening examinations most often do not take place and therefore therapy is not induced (3). This causes a high rate of adults suffering from early coxarthrosis (4). For example, in a Turkish population of more than 200 patients over 80% of cases of hip osteoarthritis were linked to hip dysplasia (5). In adults hip dysplasia is usually classified by Hartofilakidis(6) depending on the grade of dislocation of the femoral head.

2. Case report

In this article, we report of a 57-year-old principal of a school in Palestine. The mother of four children suffers from congenital hip dysplasia on the left side. Until the age of forty she tolerated her condition with taking analgesics occasionally. After the age of forty her condition worsened. The pain and the usage of analgesics increased. She started to walk with crutches and tried physiotherapy. But without any significant pain relief affecting her job as a principal. In physical examination the patient shows a waddling gait due to a difference in leg length of seven centimeters and limited movement of the left hip joint.

Local surgeons didn't suggest surgery due to increased perioperative risks with potential neural lesion of the ischiatic nerve and difficult implantation of a hip prosthesis due to her specific anatomy of the dislocated hip joint (Figure 1).

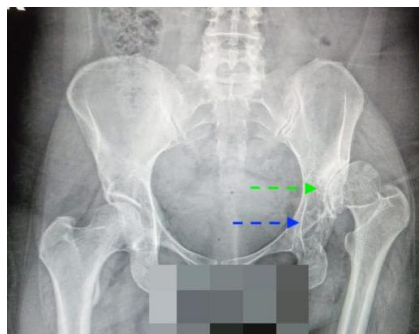


Figure 1. Preoperative x-ray of both hips in an anterior-posterior view. Complete dislocation of the left femoral head to cranial. Neo-acetabulum formed (green arrow) above the original acetabulum (blue arrow) on the left side. Classified by Hartofilakidis(6) as B.

We performed a total hip replacement of the left hip on the patient in 2021. The surgery was performed in supine position with an antero-lateral approach. The complexity within this case was the difficult implantation of the prosthetic cup due to missing lateral support. To create a lateral support, the intrasurgically removed femoral head was decartilaged and attached with two screws to the latero-caudal area of the acetabulum, after this sclerotic area was drilled for better blood supply and integration into the bone (Figure 2).

Then this new formed acetabulum wasreamed to implant the prosthetic cup. We used implants from DePuy Synthes (<https://www.injmedtech.com/de-DE/companies/depuy-synthes>). After completed implantation of the cup, we inserted the shaft into the femoral bone with a 32mm ceramic head.

After surgery the patient was requested to relieve her left leg for six weeks for the femoral head to consolidate with the latero-caudal area of the acetabulum.

Two months after surgery we performed an x-ray image of the left hip. The femoral head well incorporated itself into the acetabulum (Figure 2).

In an 18-months follow-up the patient walked freely with a normal gait and without any pain. She can well follow her day-to-day work in school and is satisfied with the success of the surgery.

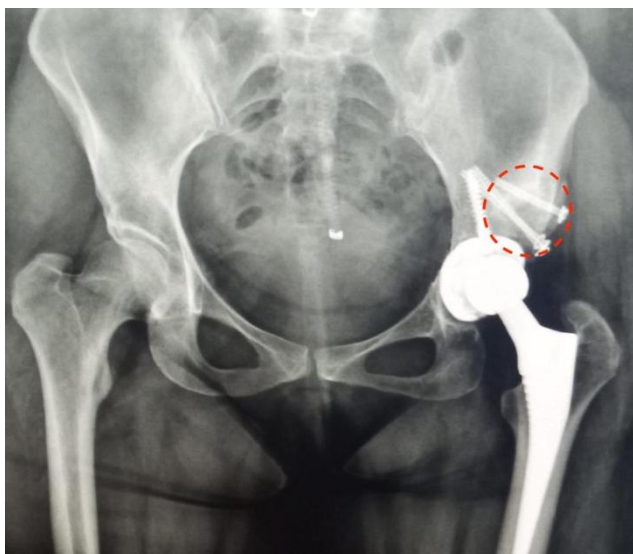


Figure 2. Postoperative x-ray of the left hip with implanted hip prosthesis two months after surgery in an anterior-posterior view. The former femoral head (red circle) was attached with screws to the latero-caudal area of the original acetabulum.

3. Discussion

Total hip replacement is one of the most done surgical procedures of our time (7). Since 1960 the surgical precision is almost perfected, and the implants are nowadays usually fixed cementless(8). For instance, in Germany, a country with about 80 million people, more than two million primary total hip replacement procedures were done within 10 years. And the numbers only increase with an ageing society (9).

But in cases with hip dysplasia standard procedures are still not established due to complex and specific anatomy of the hip joint (10).

In advanced hip arthrosis with hip dysplasia there are two main problems to be identified: First, the relative huge difference in leg length due to the femoral head to be dislocated to cranial puts the ischiatic nerve at risk to be damaged when the leg is extended (11). Second, the missing lateral support of the disformed acetabulum makes the implantation of the prosthetic cup difficult (12).

To create more acetabular space surgeons have used different techniques. Some executed periacetabular osteotomies (11, 13) which are very complicated to execute in elderly patients. Older studies show a similar approach. They used bone grafts to create a superolateral support to implant the prosthetic sup (12, 14). The problem here is the additional damage created by taking bone from a separate area. In our case we utilized the femoral head which has to be removed anyway.

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