

## A REPORT OF TWO CASES OF UNCEMENTED TOTAL HIP REPLACEMENT IN PATIENTS WITH SICKLE CELL DISEASE

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### ABSTRACT

This is a report of two sickle cell patients (HbSS) with advanced osteoarthritis of the right hip. The patients were in Ficat and Arlet's stage 3 and 4 respectively. Both were females aged 23 and 46 years and they had uncemented hydroxyapatite coated omnifit (Stryker Howmedica Osteonics) total hip prosthetic replacement. The results so far have been quite encouraging. The procedure is technically demanding, fraught with risks and expensive but very useful. This is the first of such reports in Nigeria.

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### INTRODUCTION

Sickle cell disease is the most important single gene disorder in West Africa<sup>1</sup>. The combined prevalence of haemoglobin S and C is about 2-3 percent, while the sickle cell trait (HbAS) is about 25 percent in Nigeria<sup>1</sup>. Some of these patients develop osteonecrosis of the femoral head because of the peculiar blood supply of the femoral head which makes it vulnerable to ischaemia from arterial cut off, venous stasis, intravascular thrombosis, intraosseous sinusoidal compression or a combination of these factors which are common in sicklers<sup>2</sup>. The chronic inflammatory response, biomechanical faults consequent upon head collapse, predisposition to infections and other illnesses predispose the joints to developing osteoarthritis<sup>3</sup>.

Management of the hip lesion in sicklers is technically demanding because of the proximal femoral sclerosis conferring ability to split easily<sup>4,5</sup>. A lot of orthopaedic surgeons in the advanced countries including China and India are offering these patients total hip arthroplasty even in the very young<sup>4-8</sup>. Workers are presently resorting to the uncemented prosthesis, especially those coated with hydroxyapatite because it is said to stimulate better bone growth and also achieve higher shear strength<sup>2,9-11</sup>. It is also said to enhance gap healing, improve bone ingrowth in osteoporotic bones and convert fibrous tissue to bone.<sup>7</sup> The important factor for long term survival is that uncemented prosthesis provides immediate stability to avoid implant macro-motion and good surface characteristics to encourage bone ingrowth.<sup>2,9</sup> Another advantage is in revision since most of the beneficiaries are relatively young people. This is a report to highlight this modality of treatment for sicklers in Nigeria.

### CASE 1

A 46 year old female sickle cell disease patient (HbSS) presented with right hip pain since her first pregnancy in 1979. She had an antalgic gait with 3.5cm of real length shortening. In 1986 she had a subtrochanteric derotation osteotomy in a tertiary facility, and an implant removal a year after. Her condition did not improve and she eventually developed a degenerative low back spondylosis possibly from limb length inequality. Her other past surgical history included appendectomy in 1981 and bilateral tubal ligation in 1995. She had been pregnant twice, both children are alive. She was definitely overweight with a body weight of 100kg for a 5feet height. The radiologic hip stage was Ficat and Arlet's stage 4, with collapsed femoral head, upward migration of the proximal femur with formation of a false acetabulum (Figure 1).

She was admitted three weeks prior to surgery for traction for soft tissue stretching to ease surgery and general workup including heamatronics that increased the haemoglobin level from 8.0g/ml to 10.4g/ml. She eventually had an Omnifit (Stryker Howmedica Osteonics) total hip prosthesis on her right hip three weeks after admission using a lateral approach. Due to proximal femoral sclerosis and deformity she had an upper femoral split necessitating a cerclage wiring (Figure 2). She was on partial weight bearing eight weeks after surgery to await bone healing and integration of the hydroxyapatite implants. The total hospital stay was 35 days. She mobilizes within her house bearing full weight, but partially weight bears when walking long distances because of back pain from a pre-op severe lumbar spondylosis. stability by radiological indices. She presently has a 2.5cm shortening on the operated limb. Her last follow up at about 36 months showed satisfactory hip stability by radiological indices.

## CASE 2

A 23-year-old female graduate, with sickle cell disease (HbSS) presented with a 21 month history of right hip pain. At presentation, she was limping, could not straight leg raise without support because of pain, although the range of motion of the hip was acceptable. Disuse atrophy of the affected limb was not significant. Radiograph of the hip revealed a Ficat and Arlet's stage 3 avascular necrosis of the right femoral head. There was loss of joint space, irregularity of the articular surfaces and vacuolization and subchondral cysts of the femoral head (Figure 3). She was admitted 12 days prior to surgery for preoperative workup including her haemoglobin level which increased to 10.8g/dl. She had an Omnifit (Stryker Howmedica Osteonics) total hip prosthesis through the lateral approach on 12/12/03 (Figure 4). She is already mobilizing full weight bearing with no hip pain. Her last follow up was at 30 months post operatively with an absolutely stable hip joint.

Figure 1: Pre op Hip Status in the 46 Year old



Figure 2: Hip Replacement in the 46 Year Old



Figure 3: Pre op Hip Status in 23 Years Old



Figure 4: Hip Replacement in the 23 Year Old



## DISCUSSION

Avascular necrosis of the head of femur and severe osteoarthritis of the hip joint are common complications of sickle cell disease<sup>2,3</sup>. Several treatment modalities have been tried. These include conservative antiarthritic drugs in combination with chondroitin sulphate and glucosamine, hip fusion, hemiarthroplasty, to total hip replacement<sup>2,4-7</sup>. Currently, it appears more workers prefer the uncemented total hip arthroplasty<sup>5,6,9</sup>. This is probably more advantageous since reoperation (when the life span of the prosthesis expires or in an event of a complication) is simpler when compared to a cemented replacement<sup>9,10</sup>. Arthroplasty increases hip function in osteoarthritic disease in sicklers<sup>2</sup>.

The advent of hydroxyapatite coating is of advantage as it encourages bone ingrowth, gap healing in osteoporotic bones and conversion of fibrous tissues into bone<sup>9,10,12</sup>. The uncemented hip is also said to be advantageous as its fixation is instant preventing macro motion between the acetabular cup and the bone<sup>9,11</sup>. This module includes a cup, an insert, femoral head/stem components.

Our patients were quite young; one of them being twenty three years. Launary et al even recommended this mode of treatment for adolescent sicklers<sup>6</sup>.

From this limited experience we emphasise that a preoperative workup should include haematinics and antimalarials. We propose a minimal haemoglobin level of 10g/ml; the use of antithrombotic drugs, (we used vasoprin 75mg/day for both patients). At surgery we preferred spinal anaesthesia, augmented with ketamine hydrochloride in the course of surgery. A familiar approach to the hip to be used. The use of a diathermy is very helpful and a tube drain (preferably active) is advisable. Common complications include longitudinal split of the proximal femur and early acetabular protrusion in hemiresurfaced hips<sup>4,13</sup>.

In conclusion, this preliminary report highlights an additional possibility to the treatment of arthritic hips in our sickler population and the very young with osteoarthritic changes of the hip joint. Although this procedure is technically demanding (in acquisition and cost), its advantages far outweigh the possible complications that may arise. Despite the unavailability of image intensification in many of our centers which aids in correct placement of screws in the acetabulum and also encourage minimal access, these cases can still be managed well. To our knowledge, this is the first report of the use of modular uncemented total hip replacement in young people in Nigeria despite its widespread use in some developing and developed countries.

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