INTRODUCTION: Total hip arthroplasty in patients with congenital dysplasia of the hip (CDH) poses unique reconstructive challenges because of the insufficient acetabular bone stock, distorted anatomy of the proximal femur and muscle contractures. With both cemented and uncemented cups, good early results have been reported, but at medium and long-term, high rates of loosening have been observed [1,2]. Compared to total hip replacement, hip resurfacing arthroplasty has the advantage of preserving femoral bone stock. This is particularly important for the younger patient population. In the past, metal-polyethylene hip resurfacing do not apply to MOMHR, this technique is also successfully used in CDH patients [3]. However, standard MOMHR cannot be used in the most severe cases involving an excessively short femoral neck or an insufficient head. These deformities are a contraindication for MOMHR, because of the risk of impingement and insufficient off-set. To treat young CDH patients affected by severe hip deformities with MOMHR, we developed a new surgical technique consisting of lengthening of the femoral head with impacted morcellized bone grafts. The surgical goals include the anatomical reconstruction of the patients femoral head, the restoration of joint off-set, as well as avoiding impingements, optimizing stability and equalizing leg length. The purpose of this retrospective study was to analyze the mid-term results in a consecutive series of CDH patients treated with MOMHR combined with lengthening of the femoral head.

METHODS: The methodology was approved by the ethics committee of our institution. MOMHR (BHR, Smith and Nephew, UK) combined with lengthening of the femoral head was performed in 32 patients with severe deformity of the hip, 25 of whom were female and 7 male. Median patient age at the time of surgery was 44 years. This series included hips of all Crowe types. Radiographic, CT and clinical data (Harris Hip Score, HHS) were collected at surgery, after 1 month, 3 months and at annual follow-up visits.DEXA scans of the proximal femur were taken pre-operatively in all of the patients and repeated at one year follow-up. The standard BHR-acetabular component was used in 18 patients and the CDH BHR-acetabular component with supplementary screw fixation in 14 patients. Prior to surgery, the amount of head lengthening required to restore the hip anatomy was calculated on X-rays. To lengthen the head, special tools including containing head rings and canulated impactors were developed. Bone chips produced while reaming the acetabulum were impacted on the femoral head to achieve the desired head length. Finally, the femoral component was cemented on the augmented head according to the standard surgical technique, Figure 2. Rehabilitation included no weight-bearing for 1 month and partial weight-bearing for another month.

RESULTS: The follow-up period ranged from 2 to 7 years (average, 3.5 years). Initial stability was achieved in all the hips. Median head lengthening was 1.2 cm. The clinical outcomes improved significantly compared with the pre-operative ratings until the 1 year follow-up. At the latest follow-up, the mean HHS was 95.2 points. At follow-up, 26 of the patients were involved in heavy or moderately heavy work. 6 patients practiced sports. Radiographically, there was no peri-acetabular radiolucency and all sockets were well fixed. No subsidence of the femoral components were seen on X-rays. CT showed remodeling of the grafted areas. Co and Cr serum concentrations at 25 months were 1.76 and 0.75 ng/ml, respectively. At one year follow-up, DEXA analysis of the proximal femur showed complete recovery of BMD in Gruen zone 1 and increased recovery in zone 7 compared to the pre-operative state (p= 0.05). Complications included one transient femoral nerve palsy, and one internal iliac vein rupture. This occurred while drilling the pelvic bone in a patient who had a CDH BHR-acetabular component with supplementary screw fixation. This lesion was repaired by the general surgeon.

DISCUSSION AND CONCLUSIONS: The absence of major complications and the quality of our radiographic, CT and clinical results fully support the use of femoral head lengthening combined with MOMHR in young active patients with severe deformity of the hip. By using this technique, the indication for MOMHR can be extended to patients who would not otherwise be good candidates for this procedure. As we believe that the major advantage with MOMHR is maximizing patient bone preservation, we aim at fully exploiting this truly bone sparing hip operation in the CDH patient population. The head lengthening technique is similar in concept to any impaction bone grafting technique. Impaction bone grafting techniques have been successfully used in several hip operations for both acetabular and femoral augmentation, in primary and revision surgery and in association with both cemented and uncemented implants. The CDH BHR cup is crucial for obtaining good cup positioning in severe pelvic deficiencies. In conclusion, there is evidence that hip resurfacing can be effectively used in severe CDH cases leading to a more anatomical reconstruction of the hip than with other surgical techniques. When hip anatomy is properly restored, the results are similar to other more common indications.

![Figure 1](image1.png) 59 year old female, Crowe type II. The head was lengthened by 1.4cm. X-rays taken two years after the operation showed good radiographic results

![Figure 2](image2.png) Surgical steps of the lengthening procedure

REFERENCES: