The first 100 consecutive Birmingham Hip Resurfacing of a single surgeon at a minimum of 10 years follow-up: clinical and radiographic outcomes

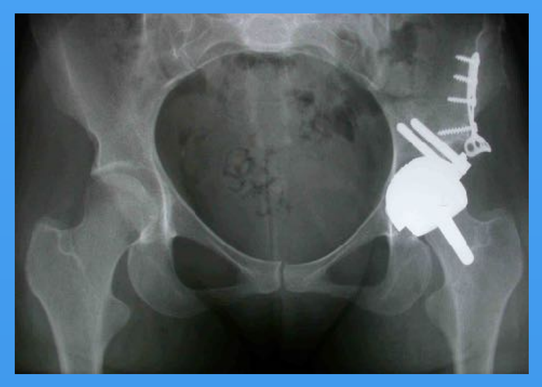
A. Moroni, G. Micera, R. Orsini, M.T. Miscione, F. Acri, S. Mosca, F. Sinapi, D. Fabbri
University Vita-Salute San Raffaele

Introduction

Today, younger and active patients need hip replacement in an attempt to restore the lost active lifestyle. Metal-on-metal hip resurfacing (MOMHR) has been introduced to increase implant longevity and optimize the functional outcomes in this challenging patients

The aim of this study was to report the survival, clinical and radiographic outcomes of the first 100 consecutive Birmingham HR (BHR) of a single surgeon at a minimum of 10 years follow-up.

F 29 years, CDH



12 years FU

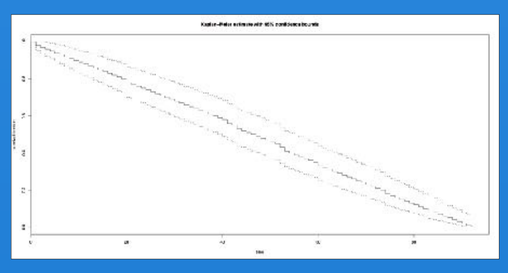
Methods

We retrospectively analyzed 100 consecutive patients operated of BHR: they represent the first 100 consecutive patients operated by a single independent surgeon. Inclusion criteria were symptomatic hip arthritis in patients younger then 65 years. For all patients Oxford Hip Score (OHS), Harris Hip Score (HHS) and University of California, Los Angeles (UCLA) activity score was completed at preoperative time, at 1 year and at the last available follow-up (FU) and a standard weight-bearing radiograph was performed. Cr and Co dosage was performed in a little group of the patients.

Results

The mean age at operation was 48.9 years (16-73). The minimum FU was 10 years (mean, 11; maximum, 13,3). Four cases failed. The mean Cr dosage was 1.4 ng/mL (<0.1-5.8, sd 1.2), mean Co dosage was 0,8 ng/mL (0,4-3.0, sd 0.5). No statistical relation was found between diagnosis and metal ions and results, but all revised patients presented a steep cup and two were CDH.

p< 0.001	OHS	HHS	UCLA activity score	Acetabular inclination angle	Femoral stem shaft angle	Femoral notch	Heterotopic bone formation	Other radiographic findings
Pre-op	29.1 ± 6.2 9.0-39.0	58.0 ±14.1 25.0-88.0	4.9 ±1.2 2.0-7.0	X	X	X	X	X
1 year FU	46.7 ±2,2 39.0-48.0	97.4 ± 3.5 85.0-100.0	7.8 ± 1.4 4.0-10.0	40.6° 30.0-56.0 sd 5.8	136° 125.0-152.0 sd 6.2	3 asymp	X	6 medial head/neck junction resorption, asympt
Last FU	47.4 ± 1,3 42.0-48.0	98.6 ± 2,3 90.0-100.0	8.2 ±1,1 6.0-10.0	40.6° 30.0-56.0 sd 5.8	136° 125.0-152.0 sd 6.2	3 asympt	2 Brooker II	6 asympt medial head/ neck junction resorption 1 sympt periacetabular rarefaction



#	Diagnosis at surgery	Age at surgery	Age at revision	Time (months)	F size	A inclination	F inclination	Diagnosis at revision	Implant component revised
1	OA in CDH	51	59	88.6	46	56°	151°	Neck femoral fracture	COC uncem stem, uncem cup
2	OA in CDH	50	52	18	42	54°	149°	Varus femoral shift	MOP uncem stem, uncem cup
3	OA	48	48	5	46	49°	148°	Neck femoral fracture	MOM uncem stem
4	OA	69	69	72	46	45°	140°	Varus femoral shift	MOP cem stem, uncem cup

F 69 years

2 months

11 months

Discussion

The designer surgeons reported an overall survival for MOMHR till 95.8% of 1000 hips at 15 years; non-designer surgeons reported inferior results in smaller groups. This can be explained by the less experience, thus the accuracy of the surgical procedure is one of the most important aspect in outcomes. In our study, the overall survival was 96% in a group of 100 hips; all failed implants had a steep and anteverted acetabular component; that is associated with increased failure risk causing edge loading and increased wear. The statistical analysis of our results has shown that over time the positioning of the acetabular component has been improved.

Female gender have been shown to affect MOMHR survival, with a revision risk for females of 1.4 times more than males. These results are confirmed by the present study: the survivorship for males was 100%, and for females was 90%. The increased failure risk in females appears to be associated especially with the small femoral head size: for each increased millimeter in size of the femoral component there is a 19% lower chance of failure. Failure in female gender is also associated with CDH; as increased anteversion of the femoral neck is common in CDH patients, the risk of implant malposition is higher. All these aspects confirm the reason of failures in our study: in fact, they occurred in females with femoral head diameter ≤46mm, and in 50% of cases the primary diagnosis was CDH. Thus, the experience of the surgeon in MOMHR in females is even more important then in males.

Finally, bone quality in females can be lower than in males, especially in >60 years olds. As a consequence of osteopenic findings after revisions, DXA are now taken preoperatively in our >45 years old female candidates for MOMHR.

The designer surgeons suggested to continue to implant MOMHR, when indication are respected, surgeon has experience, the implant is safe and patient is informed; in fact designer and non-designer surgeons that manage a large number of MOMHR reported clinical scores significantly improved; in our study too all the clinical scores significantly improved over time.

Several surgeons are becoming extremely concerned about the potential increase of Co and Cr after MOMHR and their negative effects. In several patients of this cohort they had been analyzed, with positive outcomes.

Conclusions

MOMHR with the BHR implant provides in young and active patients good clinical and radiographic outcomes with low risk of revision for at least ten years; as indication and surgical technique appear to be one of the mosto important aspects affecting the results, we think that the surgeon has to dedicate a large part of his time to this procedure and good trainings with very experienced MOMHR surgeons are suitable.

References

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