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Comment to the Article "Long-Term Results of Total Hip Arthroplasty with RM Classic Cups"

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The use of uncemented monoblock acetabular cup system «Mathys» for total hip arthroplasty has a 35 year history [1, 2]. In the entire period of use, these components demonstrated good survival (from 100% to 94,4%) in the follow up from 5 to 20 years, respectively [3, 4, 5, 6]. Such results are accounted for by the component ability to the load transfer and the biomechanical behaviour of the cup remain physiological after the implantation, thus protecting the bone from overload at its interface with the porous coating. Another indisputable advantage of the implant originates in design specifics. So, modular acetabular components that are widely used in the current practice have one common serious drawback of backside wear of the polyethylene inlay. Wear debris that penetrate the retroacetabular area through the cup holes cause osteolysis and significantly complicates further revision [7, 8]. RM cups are missing this drawback and in combination with their isoelastic properties allows to ensure good biological fixation of the cup in the long term [5, 9, 10].

However the analysis of the literature for the past 10 years demonstrates a clear trend to reduction of the number of publications dedicated to the application of above components. For this period of time we found only 2 papers dedicated to RM Classic cup, 4 — to RM Pressfit PE cup and 3 — to RM Press-fit vitamys cup. Eight of those papers were based on 100 cases series with follow up from 5 to 8 years and only one research included 189 patients with a 10-year follow up. All authors reported excellent results. What is the reason for the small number of articles?

Such a number of papers is absolutely insufficient to clearly understand the place of isoelastic acetabular monoblocks in the current hip arthroplasty.

What does this publication give us?

In this aspect the importance of the paper by V. Danilyak et al is difficult to overestimate. The research is based on 328 implantations of RM Classic cup with maximum follow up of 20 years which significantly superior to published international data. The authors used clear criteria during the study which allowed to minimize the possibility of erroneous interpretation of the outcomes. The authors found answers to some serious questions related to technique of implantation and long-term results of RM Classic. So, it was demonstrated that RM components can be successfully used both in primary standard THA and in severe forms of hip dysplasia with average

• *Comment on the Article*

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15-year survival of 92,5%. With that the wear was not associated with retro-acetabular osteolysis which significantly facilitated revisions. The obtained results look quite promising especially considering young age of the patient's group, average of 46,5 years, at the date of implantation. The authors' note on a longer learning curve for surgeons in mastering technique of RM Classic cup placement is no less important because one of the main reasons for early revisions (up to 10 years) is a errors of rotation center position and malposition. That's why the wide introduction of such implants into the clinical practice of hospitals with small volume of THAs should be treated with caution. In a complex it gives an insight that RM Classic cup can provide good late outcomes of total hip replacement provided proper training of surgeons.

We have a comprehensive information and it's not difficult to form an opinion regarding RM Classic components efficiency in combination with ceramics and metal heads 28 mm. But is it sufficient to understand the behavior of all isoelastic acetabular components? Changes only one feature of the prosthesis (for example, cup design or type of polyethylene) will have significantly affect for whole system. Today we have latest generations of RM component with heard of bigger diameter and produced of other materials. Besides the authors made only a passing reference to specifics of redistribution of polyethylene wear particles and to rate of osteolysis in the proximal femur. In our opinion this is also an important aspect to understand results of uncemented monoblock acetabular cup system.

Where should we go?

Most of the studies agree with the indisputable advantage of any RM cups, namely its ability to adapt to physiological acetabulum deformity which, combined with preventing wear particles penetration into the retroacetabular bone, ensures excellent survival rate [11, 12]. But is it so simple? Today there are some works indicating the difference in polyethylene strength depending on its molecular structure [7, 8]. Both engineers and researchers observe that HXLPE polyethylene used for RM Pressfit vitamys components greatly surpasses from UHMWPE used for RM Classic and RM Pressfit PE components in terms of hardness which allows to achieve higher wear resistance [5, 6, 10, 13]. However, we should not forget that implants are often used in case of osteoporosis, or sclerosis bone in case of dysplasia or posttraumatic arthrosis. So, the question is how efficient the isoelastic concept in these cases? Unfortunately, neither of the found publications provided clear answers which are important for determining indications for use of isoelastic components.

Another equally important issue is osteolysis in the proximal femur. It's necessary to understand this process while revision of the femoral component in cases of bone and muscular loss also a serious problem. Unfortunately, authors of the majority of publications scarcely mention such phenomenon, scope of this process and the outcomes. We managed to find only two papers where authors reported two cases of osteolysis and 98 and 100% survival rate of cemented stems in combination with RM Pressfit cups [14, 15]. Despite significant number of observations (100 cases) it's too early to make conclusions, because follow up period was only 2 and 5 years.

What will we get in the future?

Comprehensive understanding of functioning of the isoelastic acetabular components and their place in total hip arthroplasty is not possible without further wide research to supplement the accumulated experience. Systematization of the knowledge can give a more accurate understanding of strengths and weaknesses of above such components and their effect on the prosthesis in general. Then it would be possible to establish unified algorithms for clinical application depending on patient's age, level of patient's activity and hip pathology.

Besides the accumulated experience can be used for optimization of design of isoelastic acetabular components to facilitate their implantation and maximally reduce the risk of negative consequences related to their further functioning.

So, this article can become a good start for a serious discussion about future of isoelastic implants in the total hip arthroplasty.

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