

Dual Mobility Cup in Patients Younger Than 70 Years: Preliminary Results of a Case Series

María Florencia Molina, Guillermo A. Ricciardi, José D. Mancilla Vargas, Florencia S. Scaglione, Martín Loayza Gómez, Martín A. Pérez

Hip and Knee Disease Department, Orthopedics and Traumatology Service, Hospital General de Agudos "Teodoro Álvarez", Autonomous City of Buenos Aires, Argentina

ABSTRACT

Objective: To evaluate the clinical and radiographic outcomes of patients younger than 70 years who underwent total hip arthroplasty with a dual mobility acetabular cup system. **Materials and Methods:** Retrospective descriptive study of 61 patients (mean age, 62 years) treated with cemented and uncemented dual mobility acetabular components between 2014 and 2019. Mean follow-up was 47 months (range, 36-86). Clinical evaluation included the *Harris Hip Score* and the *Oxford Hip Score*, together with radiographic assessment of both hips. **Results:** Indications for surgery were avascular necrosis of the hip (8 cases), femoral neck fracture (17 cases), and hip osteoarthritis (36 cases). During follow-up, no dislocations or component loosening were observed. One patient reported localized pain associated with trochanteric bursitis. The mean postoperative *Harris Hip Score* was 95 points, and the mean *Oxford Hip Score* was 45, which was a significant improvement. **Conclusions:** The dual mobility cup is a valid option for patients younger than 70 years, regardless of the underlying condition. Its use reduces the risk of prosthetic dislocation and provides good clinical outcomes, while also lowering hospitalization and reoperation costs.

Keywords: Dual mobility cup; primary total hip arthroplasty; adults under 70.

Level of Evidence: IV

Copa de doble movilidad: experiencia en pacientes <70 años. Resultados preliminares de una serie de casos

RESUMEN

Objetivo: Evaluar los resultados clínicos y radiográficos en una serie de pacientes <70 años sometidos a una artroplastia total de cadera con el sistema de copa acetabular de doble movilidad. **Materiales y Métodos:** Estudio descriptivo retrospectivo de 61 pacientes (edad promedio 62 años) tratados con un reemplazo de cadera utilizando componentes acetabulares cementados y no cementados con el sistema de doble movilidad, entre 2014 y 2019. El seguimiento promedio fue de 47 meses (rango 36-86). Para la evaluación se utilizaron el *Harris Hip Score*, el *Oxford Hip Score* y radiografías de ambas caderas. **Resultados:** Los cuadros operados fueron: 8 casos de necrosis avascular de cadera, 17 fracturas mediales de cadera y 36 coxartrosis. En el seguimiento, no se detectaron casos de luxaciones ni de aflojamiento de los componentes. Un solo paciente tuvo dolor localizado que se asoció a bursitis trocantérica. El *Harris Hip Score* funcional promedio fue de 95, mientras que el *Oxford Hip Score* fue de 45, lo que refleja mejoras posoperatorias significativas. **Conclusiones:** La copa de doble movilidad es una opción válida para pacientes <70 años, independientemente de su enfermedad de base. Su uso disminuye las luxaciones de la prótesis y obtiene buenos resultados clínicos, lo cual va acompañado de reducciones en los costos hospitalarios de internación, cirugías de reducción protésica y de revisión.

Palabras clave: Copa de doble movilidad; artroplastia total primaria; adultos menores de 70 años.

Nivel de Evidencia: IV

Received on January 27th, 2024. Accepted after evaluation on June 17th, 2025 • Dr. MARÍA FLORENCIA MOLINA • florenciamolina1989@gmail.com  <https://orcid.org/0000-0002-3747-044X>

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INTRODUCTION

The number of hip arthroplasties has increased over the years, in parallel with rising life expectancy. Likewise, an increase in complications has been recognized.¹ One of the most feared complications with Gibson's posterolateral approach is dislocation of the prosthetic components. The dual-mobility system was developed in 1974 by the French surgeon Gilles Bousquet as a solution that, over time, has gained broad acceptance, displaced self-retaining cups, and, above all, improved biomechanical characteristics.² It is indicated in the presence of neurovascular injuries, neurological diseases, abductor (gluteus medius) deficiency, and in patients >70 years of age.¹

Total hip arthroplasty (THA) in patients <70 years implies that the implant materials will be exposed to daily activities of varying demands, as well as occupational and sports activities, over a long period of time, posing significant challenges related to osteolysis, wear, and stability.³

The objective of this study was to evaluate clinical and radiographic outcomes in a series of patients <70 years who underwent THA with a dual-mobility acetabular cup system.

MATERIALS AND METHODS

A descriptive, retrospective study was conducted, reporting preliminary results at 2 years of follow-up, in a series of patients treated with primary THA using a dual-mobility cup at a single center (a tertiary-care institution in the public health system of the Autonomous City of Buenos Aires) between January 2014 and December 2019 (Figures 1 and 2).

A sample was obtained according to the following inclusion criteria: age between 50 and 70 years, both sexes, having undergone THA with a dual-mobility cup (cemented, uncemented, or hybrid).

Exclusion criteria were: oncologic disease, arthritis/collagenopathies, severe cognitive impairment and bedridden status, follow-up <6 months, or noncompliance with postoperative instructions. Data were obtained from inpatient/outpatient medical records and the radiographic archive for the following study variables: pathologic diagnosis, functional scores, age, sex, comorbidities, and surgical risk.



Figure 1. A. Anteroposterior radiograph of both hips in a 65-year-old man showing a subcapital fracture of the left hip. B. Postoperative AP radiograph of both hips showing a hybrid dual-mobility prosthesis in the left hip.



Figure 2. A. AP radiograph of both hips in a 69-year-old woman showing left hip osteoarthritis. B. Postoperative AP radiograph of both hips showing an uncemented total dual-mobility prosthesis in the left hip.

All patients were operated using a Gibson posterolateral approach by the same surgical team. Domestically manufactured cups (Polygram®) and French-manufactured cups (SATURNE®) were used. All patients followed the same rehabilitation plan, consisting of sitting and isotonic/isometric exercises starting 24 hours after surgery. For cemented total prostheses, patients were instructed to stand with a 4-point walker and were discharged 48 hours after surgery; for uncemented and hybrid total prostheses, standing was indicated at 3 weeks, with discharge likewise at 48 hours. Finally, all patients were prescribed three weekly sessions of physical therapy, reinforced with daily home exercises. Sutures were removed at 18-21 days postoperatively in all cases. Function was assessed using the modified *Harris Hip Score* (HHS) and the *Oxford Hip Score* (OHS) before surgery and at 6, 12, and 24 months.⁴

The modified HHS, administered via patient questionnaire, evaluates post-hip-surgery outcome by considering pain and hip joint function. Specifically, the functional activities assessed are: gait (limp, support, distance tolerated), stair climbing, putting on socks and shoes, ability to sit, and use of public transport. The maximum score is 100. Scores of 90-100 are considered excellent; 80-89, good; 70-79, fair; and <70, poor. The OHS assesses quality of life in patients with hip osteoarthritis. It comprises 12 questions, each with five response options scored 0-4. The lowest total (0) indicates the most symptoms/difficulty; the highest (48) indicates no impact on quality of life. Quality-of-life categories: excellent >41, good 34-41, moderate 27-33, poor <27.

Radiographic outcomes were evaluated on anteroposterior and lateral projections to detect osteolysis, migration, and radiolucent lines, according to the regions described by DeLee and Charnley for the acetabulum and the Gruen zones for the femoral stem.^{5,6}

Sociodemographic variables (age, sex), fixation type (cemented, uncemented, hybrid), and underlying condition (trauma, osteonecrosis, osteoarthritis) were also recorded. This study complies with the guidelines of the Declaration of Helsinki regarding the use of identifiable information in human research. All patients provided consent to participate.

Statistical Analysis

Categorical variables are expressed as frequency and percentage, analyzed with the χ^2 test or Fisher's exact test. Numerical variables are expressed as mean or median according to distribution, with corresponding dispersion measures (standard deviation and range). Student's t-test was used to compare means for normally distributed variables between two groups, and ANOVA for comparisons across three or more groups. The Kruskal-Wallis and Friedman tests were used for nonparametric variables. A p value <0.05 was considered statistically significant. Analyses were performed using SPSS Statistics 25.

RESULTS

A total of 61 patients (30 women and 31 men) underwent THA with a dual-mobility acetabular cup system [cemented, n = 17 (27.9%); hybrid, n = 10 (16.4%); uncemented, n = 34 (55.7%)]. The mean age was 62.5 years. The following underlying conditions were recorded: hip osteoarthritis (36 cases, 59%), subcapital hip fracture (17 cases, 27.9%), and avascular necrosis of the hip (8 cases, 13.1%). Demographic characteristics are shown in Table 1.

Table 1. Description of the sample (n = 61)

Variable	Results	
Age; mean (SD; range)	62.5	(4.4; 53-69)
Gender; n (%)		
Female	30	(49.2)
Male	31	(50.8)
Comorbidities (number); median (range)	0	(0-2)
ASA; n (%)		
ASA I-II	53	(86.9)
ASA III or higher	8	(13.1)
IMC >25; n (%)	17	(27.9)
Type of fixation; n (%)		
Total cemented	17	(27.9%)
Hybrid	10	(16.4%)
Non-cemented	34	(55.7%)
Diagnosis; n (%)		
Hip osteoarthritis	36	(59.0)
Subcapital hip fracture	17	(27.9)
AVN	8	(13.1)

SD = standard deviation; ASA = *American Society of Anesthesiologists* physical status classification system; BMI = body mass index; AVN = avascular necrosis of the hip.

For descriptive purposes, clinical and demographic characteristics were compared among disease groups; age distribution was the only statistically significant difference. Patients with avascular necrosis of the hip were younger (Figure 3). However, in the authors' opinion, given that the sample comprised patients <70 years and considering the preliminary descriptive nature of the study, this difference is not clinically relevant to our investigation. Age, sex, body mass index, comorbidities, and ASA (*American Society of Anesthesiologists*) score are summarized in Table 2.

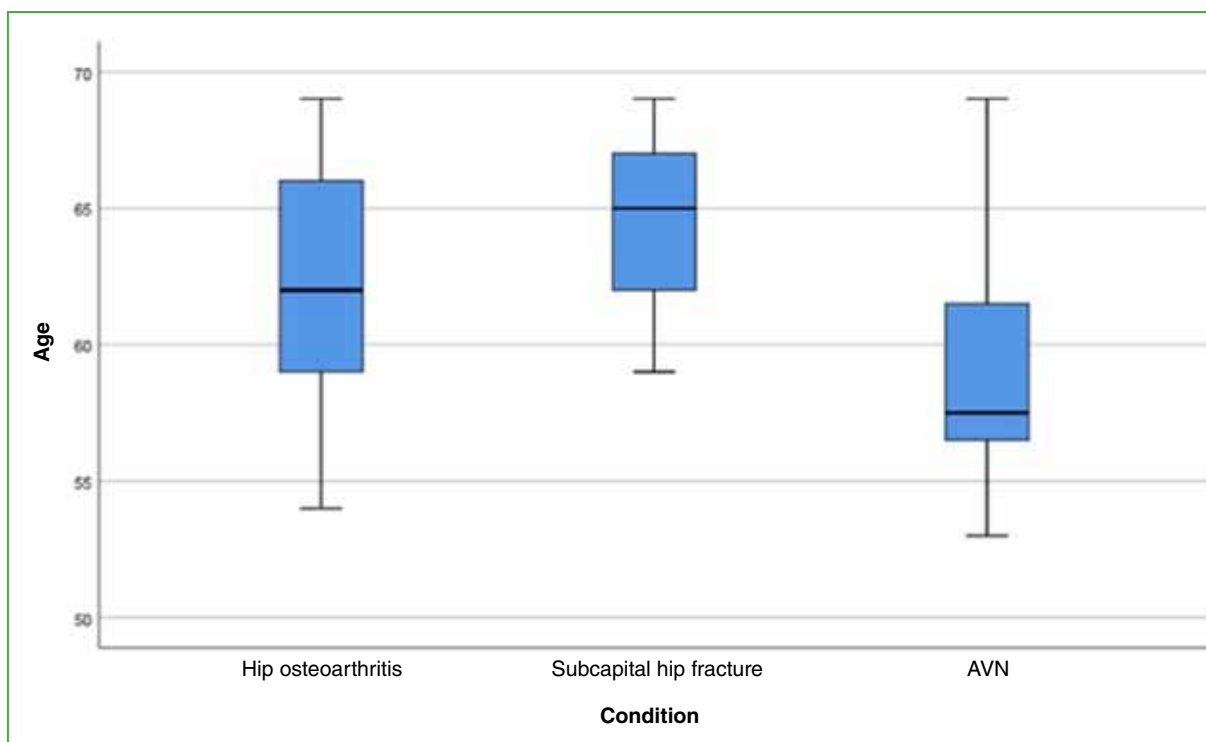


Figure 3. Box plot showing age distribution according to diagnosis.

Table 2. Distribution of age, sex, comorbidities, ASA, and BMI variables according to diagnosis.

Variables	Diagnosis			p [*]
	Hip osteoarthritis (n = 36)	Subcapital hip fracture (n = 17)	Hip AVN (n = 8)	
Age; mean (SD; range)	62.39 (4.3; 54-69)	64.41 (3.3; 59-69)	59.1 (5.0; 53-69)	0.017
Sex; n (%)				
Female	15 (41.7)	10 (58.8)	5 (62.5)	0.365
Male	21 (58.3)	7 (41.2)	3 (37.5)	
Comorbidities (number); median (range)	0 (0-2)	0 (0-2)	0 (0-1)	0.726
ASA; n (%)				
ASA I-II	31 (86.1)	15 (88.2)	7 (87.5)	0.976
ASA III or higher	5 (13.9)	2 (11.8)	1 (12.5)	
BMI >25; n (%)	8 (22.2)	8 (47.1)	1 (12.5)	0.09

SD = standard deviation; ASA = American Society of Anesthesiologists physical status classification system; BMI = body mass index; AVN = avascular necrosis. (*) The p-value was calculated using the ANOVA test for age between groups; the χ^2 test for sex, ASA score, and BMI; and the Kruskal-Wallis test for comorbidities.

Over a preliminary 2-year follow-up, no serious surgery-related complications occurred (infection, prosthesis instability, loosening). One patient had localized pain associated with trochanteric bursitis; the overall complication rate was <2%.

Functional assessments with HHS and OHS reflected favorable early clinical progress, with statistically significant differences between preoperative scores and 2-year scores. Data are summarized in Table 3.

Table 3. Pre- and postoperative comparison according to the *Harris Hip Score* and the *Oxford Hip Score*

Time	Preoperative		6 months		12 months		24 months		p*
Scales; median (range)									
<i>Oxford Hip Score</i>	26	(20-35)	40	(35-42)	45	(40-48)	45	(42-48)	<0.001
<i>Harris Hip Score</i>	65	(53-75)	86	(80-96)	93	(88-98)	95	(90-98)	<0.001

*The p-value was obtained from Friedman's statistical test for comparing three or more nonparametric dependent samples.

DISCUSSION

The survival rate was 100% at a mean follow-up of 47 months, comparable to the study by Gómez-García, which reported 97.6% at 31 months.⁷

The mean OHS for quality of life was 45, similar to results reported by Matsen et al., who found a mean OHS of 41.8 ± 6.28 at a mean 28.8-month follow-up.⁸

The mean HHS was 95, comparable to that reported by Puch et al. (95.6) at an average follow-up of 11 years.⁹

It should be emphasized that, in our study, the etiology prompting THA was heterogeneous, as scheduled primary replacements in patients with hip fractures due to bone fragility were included. This represents a study limitation due to potential selection bias in further analyses and precludes broad generalization of conclusions. Nonetheless, as a descriptive study intended to present outcomes in a series of patients <70 years, inclusion was accepted per the authors' criteria.

It should also be clarified that, although all included patients were <70 years, there was a significant age difference in the fracture subgroup, with a higher mean age. In our setting, we have experience using dual-mobility cups as a valid option in patients >65 years, with acceptable functional outcomes and a relatively low dislocation rate (0.9%).¹⁰ According to registry data from Sweden and England, and reports by Bozic from the Mayo Clinic group, dislocation is the most common cause of revision within the first year.¹¹

CONCLUSIONS

Based on our results, primary THA with a dual-mobility cup in patients <70 years may represent a valid surgical option due to the low dislocation rate and good medium-term survival. However, these are preliminary findings that must be considered in the context of long-term follow-up. We believe it is essential to evaluate implant wear over time and to increase the number of cases, both representing limitations of the present study.

Further research is needed to compare the long-term outcomes of dual-mobility cups (with respect to wear) versus conventional cups. A strength of our study is that the proposed surgery resulted in no complications and enabled return to usual activities.

Conflicts of interest: The authors declare no conflicts of interest.

G. A. Ricciardi ORCID ID: <https://orcid.org/0000-0002-6959-9301>

J. D. Mancilla Vargas ORCID ID: <https://orcid.org/0000-0002-0025-1251>

F. S. Scaglione ORCID ID: <https://orcid.org/0000-0002-0261-380X>

M. Loayza Gómez ORCID ID: <https://orcid.org/0000-0001-9079-5641>

M. A. Pérez ORCID ID: <https://orcid.org/0000-0002-2163-0680>

REFERENCES

1. Kaiser D, Kamath AF, Zingg P, Dora C. Double mobility cup total hip arthroplasty in patients at high risk for dislocation: a single-center analysis. *Arch Orthop Trauma Surg* 2015;135(12):1755-62. <https://doi.org/10.1007/s00402-015-2316-5>
2. Lamo-Espinosa JM, Gómez-Álvarez J, Gatica J, Suárez Á, Moreno V, Díaz de Rada P, et al. Cemented dual mobility cup for primary total hip arthroplasty in elder patients with high-risk instability. *Geriatrics (Basel)* 2021;6(1):23. <https://doi.org/10.3390/geriatrics6010023>
3. Nilsson A, Bremander A. Measures of hip function and symptoms: Harris Hip Score (HHS), Hip Disability and Osteoarthritis Outcome Score (HOOS), Oxford Hip Score (OHS), Lequesne Index of Severity for Osteoarthritis of the Hip (LISOH), and American Academy of Orthopedic Surgeons (AAOS) Hip and Knee Questionnaire. *Arthritis Care Res (Hoboken)* 2011;63(Suppl 11):S200-S207. <https://doi.org/10.1002/acr.20549>
4. DeLee JG, Charnley J. Radiological demarcation of cemented sockets in total hip replacement. *Clin Orthop Relat Res* 1976;(121):20-32. PMID: 991504
5. Gruen TA, McNeice GM, Amstutz HC. "Modes of failure" of cemented stem-type femoral components: a radiographic analysis of loosening. *Clin Orthop Relat Res* 1979;(141):17-27. PMID: 477100
6. De Martino I, Triantafyllopoulos GK, Sculco PK, Sculco TP. Dual mobility cups in total hip arthroplasty. *World J Orthop* 2014;5(3):180-7. <https://doi.org/10.5312/wjo.v5.i3.180>
7. Gómez-García F. Copa de doble movilidad: aciertos, riesgos y enseñanzas. *Acta Ortop Mex* 2022;36(5):308-17. <https://doi.org/10.35366/111166>
8. Matsen Ko LJ, Pollag KE, Yoo JY, Sharkey PF. Serum metal ion levels following total hip arthroplasty with modular dual mobility components. *J Arthroplasty* 2016;31(1):186-9. <https://doi.org/10.1016/j.arth.2015.07.035>
9. Puch JM, Derhi G, Descamps L, Verdier R, Caton JH. Dual-mobility cup in total hip arthroplasty in patients less than fifty-five years and over ten years of follow-up: A prospective and comparative series. *Int Orthop* 2017;41(3):475-80. <https://doi.org/10.1007/s00264-016-3325-x>
10. Prudhon JL, Ferreira A, Verdier R. Dual mobility cup: dislocation rate and survivorship at ten years of follow-up. *Int Orthop* 2013;37(12):2345-50. <https://doi.org/10.1007/s00264-013-2067-2>
11. Garabano G, Alonso MI, Pérez Alamino L, Jaime A, Cullari M, Pesciallo C. Resultados iniciales del uso de cotilos de doble movilidad en pacientes <65 años con fractura de cadera. Análisis retrospectivo de 102 casos. *Rev Asoc Arg Ortop Traumatol* 2023;88(5):520-6. <https://doi.org/10.15417/issn.1852-7434.2023.88.5.1757>