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CASE REPORT

Study of 4 Cases of Intraprosthetic Dislocation in the Dual-Mobility Cup

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Abstract

Introduction: The occurrence of intraprosthetic dislocation, a complication specific to the dual-mobility cup, is a concern for practitioners. The objective of this study is to determine whether a varus femoral stem is a risk factor for the occurrence of this type of dislocation.

Patients and Methods: This was a prospective study of 4 cases of intraprosthetic dislocations in total hip arthroplasties with dual-mobility cups, collected over a period of 6 months at the Orthopedic and Traumatology Department of the Metropole Savoie Hospital Center. The patients included were aged 63 years and older, had presented with an intraprosthetic dislocation, and required surgical revision.

Results: The average age of the patients was 74 years. The circumstances surrounding the occurrence of these intraprosthetic dislocations were marked by domestic accidents from falling from their height (50% of cases), followed by ski accidents and falls in the mountains (25% each). Three out of the four femoral stems were varus.

Conclusion : Intraprosthetic dislocation in the dual-mobility cup is becoming an increasingly rare accident, and the varus femoral stem may, among other factors, constitute a contributing factor.

Keywords: Intraprosthetic Dislocation, Dual Mobility, Varus Femoral Stem, Total Hip Arthroplasty.

1. Introduction

Introduced in 1974 by Gilles Bousquet, the dual-mobility cup has undergone several mutations (1). However, the occurrence of intraprosthetic dislocation (IPD), which corresponds to the dissociation between the femoral head and the polyethylene insert (2), remains specific to dual mobility and constitutes a formidable complication of this surgery. The aim of this study is to contribute to our understanding of intraprosthetic dislocation by reviewing the literature, and to determine whether the use of the varus femoral stem is a risk factor for the occurrence of this intraprosthetic dislocation?

2. Patients and Methods

This is a prospective study conducted over a 6-month period from January to July 2023, focusing on 4 cases collected in the Orthopedic and Traumatology Department of the Metropole Savoie Hospital Center. The patients included in this study were aged 63 years and older, had presented with an intraprosthetic dislocation (figure1: 1a, 1b) of a total hip arthroplasty with a dual-mobility cup during the study period, and required surgical revision. For three of the patients, this revision involved re-accessing the posterior-external approach of Moore and replacing the intermediate components of the dual-mobility cup.

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Figure 1a. *right hip (highlighting a decoaptation of the head with the polyethylene still in place within the metal cup).*

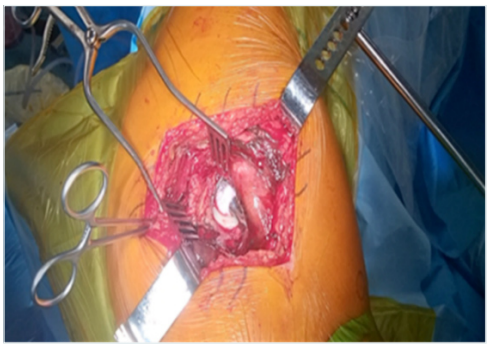

Figure 1b. *intraoperative image of the right hip (showing the early formation of metallosis on the soft tissues due to friction).*

In one patient, alongside the replacement of the intermediate components, the acetabular cup was replaced, and a Kerboul cross was implanted (figure 2: 2a, 2b, 2c).

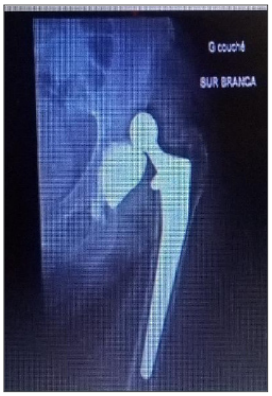

Figure 2a. *Left hip prosthesis dislocation (PTH).*

Figure 2b. *After reduction, eccentric neck of the hip prosthesis (IPD).*

Figure 2c. *Revision surgery with Kerboul cross, replacement of the acetabular cup, and intermediate components.*

3. Results

We recorded a total of 4 cases of intra-prosthetic dislocation in 4 patients, with an equal number of male and female patients. The average age of these patients was 74 years (ranging from 63 to 84 years). All patients were previously autonomous, with an average Parker score of 7.5, ranging from 6 to 9.

The circumstances leading to these intra-prosthetic dislocations were primarily marked by falls from height while descending stairs (50% of cases), followed by skiing accidents and mountain falls, each accounting for 25%.

The characteristics of the prosthetic implants used, as well as the time elapsed between the placement of the prosthesis and the occurrence of the intra-prosthetic dislocation, were analyzed. Were recorded in the table below(table).

Table. *Characteristics of Prosthetic Implants and Fitting Time*

Patients	Stem	Head	Neck	Acetabulum	PTH placement	PTH revision	Exception	Prosthesis type	Head diameter	Cup diameter
P1	Varied	Ceramic	Long	Non-cemented	July 2022	February 2023	HAP size 4	Saturne n°2	28 mm	54 mm
P2	Varied	Chrome-Cobalt	Long	Non-cemented	July 2019	April 2023	HAP size 3	Saturne n°2	28 mm	52 mm
P3	Standard	Ceramic	Medium	Cemented	April 2023	June 2023	HAP size 15	Lepine	28 mm	54 mm
P4	Varied	Ceramic	Long	Non-cemented	October 2018	May 2023	HAP size 6	Avantage	28 mm	54 Mm

HAP: hydroxyapatite

The clinical and radiological progression was favorable and satisfactory in all patients.

4. Discussion

The occurrence of intra-prosthetic dislocation (IPD), which is of traumatic origin marked by a violent shock, constitutes the common etiology in our patients. Understanding the causes of dislocation is even more important as the surgeon must undertake a thorough etiological investigation to prevent recurrence (3). In our series, three out of four femoral stems are varus (table).

In the choice of femoral stem type in the dual mobility cup, it is necessary to consider the design of the stem, which may likely be a factor favoring the occurrence of intraprosthetic dislocation (IPD). The prosthetic dislocation rates for simple mobility prostheses range from 1.9% to 4.8% at one year, and this rate increases by 1% every five years (4). The advent of the dual mobility cup has significantly reduced the incidence of dislocation following total hip arthroplasty. This incidence has decreased to a rate lower than 1% in series reported by some authors (5, 6, 7). Moreover, according to data from the SOFCOT 2009 symposium, the dislocation rate in dual mobility is 0.43% after more than 10 years of follow-up (7). In the same data, the rate of IPD in dual mobility was 0.2% after 11 years of follow-up. IPD remains extremely rare today, and its incidence is zero in some series (8, 9, 10). The biomechanical principles of the dual mobility cup, as described by Frédéric F et al. (1), allow for distinguishing three elements involving three joints: the first, the major articulation between the metallic cup and the polyethylene cup; the second, the small articulation between the metallic or ceramic femoral head and the polyethylene cup; and finally, the articulation between the prosthetic neck and the periphery of the polyethylene. We did not observe wear of the third articulation or the retention lip in our patients during surgery, as described in some published series (2, 11) as causes for IPD occurrence. However, we recorded a case during surgery with early formation of metallosis on the soft tissues (Fig1b) due to the friction of dislocated prosthetic components, and this occurred without wear of the third articulation. Some authors (11, 12) suggest that a probable cause of IPD is a malfunction of one of the two mobilities. The absence of wear on one of the surfaces in contact likely indicates a lack of mobility in that surface.

In the series by Bertrand B et al. (12), 90% of IPDs showed no wear on either of the two surfaces. From all of the above, none of these studies make a distinction between the occurrence of IPD and the design of the femoral stem. This design attracts our attention because, in this series, three out of four femoral stems are varus stems. From its invention to the present day, despite the advancements in dual mobility cups that have considerably reduced the dislocation rate to less than 1%, or even zero in some studies, intraprosthetic dislocation, though rare, remains a specific complication of dual mobility that should not be overlooked. The varus stem or the failure of intraprosthetic mobility could be a factor favoring the occurrence of this type of dislocation. However, the size of our sample is not large enough to assert a link between the type of stem and the occurrence of IPD. Large-scale studies must be conducted to more objectively clarify the hypothesis of this link.

5. Conclusion

Despite its rarity, intraprosthetic dislocation remains a formidable and unresolved complication in total hip arthroplasties with dual mobility. There is a strong presumption of a link between the occurrence of IPD and the varus femoral stem.

Declaration of Interests

The authors declare that they have no conflicts of interest.

Contribution of Authors

Idrissa Seidou Mohamed: Assistant operator, data collection, analysis, and writing Eric Montbarbon, Emmanuel Beaudouin, Thiery Lebredonchel, Cristian Vasile: Operators

Fasto Ladu T. Yugusuk: proofreading, English translation Souna Badio Seyni: Advice for writing, proofreading, and correction

6. References

1. Fréderic F, Daniel N, Jacques C. Gilles Bousquet's dual mobility cup: A revolutionary concept in total hip prosthesis. Journal of Materials Science, in Medicine, 1994; 5.
2. Lecuire F., Benareau I., Rubini J., Basso M. Intra-prosthetic dislocation of the Bousquet dual mobility socket. Rev Chir Orthop Réparatrice Appar Mot, 2004; 90(3): 249-55.
3. Dorr L D., Wan Z. Causes of and treatment protocol for instability of total hip replacement. Clin Orthop. 1998; 355: 144-51.
4. Berry D.J., von Knoch M., Schleck C.D., Harmsen W.S. The cumulative long-term risk of dislocation after primary Charnley total hip arthroplasty. J Bone Joint Surg Am, 2004; 86A (1): 9-14.
5. Dargel J, Oppermann J, Brüggemann GP, Eysel P. Dislocation following total hip replacement. Dtsch Arztebl Int 2014; 111: 884-90.
6. Prudhon J.L., Steffann F., Ferreira A., Verdier R., Aslanian T., Caton J. Cementless dual-mobility cup in total hip arthroplasty revision. Int Orthop, 2014; 38(12): 2463-8.
7. Combes A., Migaud H., Girard J., Duhamel A., Fessy MH. Low rate of dislocation of dual-mobility cups in primary total hip arthroplasty. Clin Orthop Relat Res, 2013; 471(12): 3891-900.
8. Bauchu P., Bonnard O., Cyprès A., Fiquet A., Girardin P., Noyer D. The dual-mobility polarcup: first results from a multicenter study. Orthopedics, 2008; 31(12 Suppl 2).
9. Leclercq S., Benoit J.Y., de Rosa J.P., Tallier E., Leteurtre C., Girardin P.H. Evora chromium-cobalt dual mobility socket: Results at a minimum 10 years' follow-up. Orthop Traumatol Surg Res, 2013; 99(8): 923-8.
10. Caton J.H., Prudhon J.L., Ferreira A., Aslanian T., Verdier R. A comparative and retrospective study of three hundred and twenty primary Charnley type hip replacements with a minimum follow-up of ten years to assess whether a dual mobility cup has a decreased dislocation risk. Int Orthop, 2014; 38: 1125-9.
11. Julien G. Surgery for instability in first-line total hip replacements, e-mémoires of the National Academy of Surgery, 2014, 13(2): 065-068.
12. Bertrand B., Thomas N., Jean G., Remi P., Alexandre D I., Fréderic F. Intra-prosthetic dislocation-fossil history of dual mobility? Explant response. Rev Chir Orthop, 2015; 101(7): 186-187.