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ORIGINAL ARTICLE

Survival of cementless dual mobility socket with a mean 17 years follow-up

Étude d'une série de 438 cupules non cimentées à double mobilité

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KEYWORDS
Dual mobility socket;
Total hip prosthesis;
Dislocation;
Tripolar unconstrained cup

Summary
Purpose of the study. — As part of the 2006 symposium of the French Hip and Knee Society devoted to the dual mobility socket, we report a retrospective multicentric series of 438 first-intention total hip prostheses with a dual mobility socket at a mean 17 years follow-up. The purpose of our report was to ascertain the 15-year survival of this socket and analyze failures.
Material and methods. — The series included 438 primary replacements. This was a homogeneous multicentric series. The cementless sockets were 80 Novae-1® titanium Serf cups and 358 Novae-1® stainless steel Serf cups. All stems were inserted without cement: 185 Pf® stainless steel screwed Serf stems, 228 PRO® titanium screwed Serf stems, and 25 Corail® stems. The mobile polyethylene insert was retaining. All of the heads were 22.2-mm chromium-cobalt heads. Degenerative hip disease was the main etiology and mean follow-up was 17 years (range, 12—20). Mean age at implantation was 54.8 years (range, 23—87). The actuarial method with a 95% confidence interval was used to determine the 15-year cup survival rate.

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Results. — At the last follow-up, none of the patients had presented an episode of early or late instability. Analysis of the socket at last follow-up showed 13 aseptic loosenings, 23 intraprosthetic dislocations, and seven replacements of the polyethylene insert for wear. The overall 15-year prosthesis survival rate was 89.2 ± 8.7%. The overall 15-year socket survival rate was 96.3 ± 3.7%.
Discussion. — The fact that, at last follow-up, none of the implants had shown instability confirms the long-term stability of the dual mobility socket. The results in terms of 15-year survival confirm earlier reports. The main cause of failure was cup fixation, which is the weak point of this technique with the initial Novae cup design, which did not have hydroxyapatite coating. The second leading cause was intraprosthetic dislocation, which can be divided into three main categories. The first is intraprosthetic dislocation in a context of pure wear with normal function of the dual mobility socket; the retaining feature of the insert loses its efficacy due to wear. The second category is intraprosthetic dislocation in a context of cup loosening with a third-body effect and increased retention wear, in which case we consider that cup loosening is the primary event leading to rapid secondary wear and subsequent intraprosthetic dislocation. The third category is intraprosthetic dislocation caused by a blockage in a context of fibrosis or impingement involving severe heterotopic ossifications. We had only two femoral failures related to aseptic loosening, most certainly related to use of noncemented implants, which limits the extension of granulomas to the polyethylene. Studying the three series from Saint-Étienne more specifically, where three different configurations were used, it would appear that the titanium cup has a better survival rate and that the titanium used for the thinner necks may be an unfavorable factor for intraprosthetic dislocation.

MOTS CLÉS
Cupule double mobilité ;
Prothèse de hanche ;
Luxation

Résumé Nous avons rapporté dans le cadre du symposium sur la double mobilité de la Société française de hanche et de genou de 2006, une série rétrospective multicentrique à 17 ans de recul moyen de 438 prothèses totales de hanches de première intention avec une cupule double mobilité. Le but était d'étudier la survie à 15 ans de cette cupule et d'analyser les échecs. La série étudiée comprenait 438 prothèses implantées en première intention. Cette série multicentrique était homogène. Les implants utilisés étaient toujours une cupule double mobilité Novaé-1 (titane ou inox) avec une tige sans ciment, un insert mobile en polyéthylène et des têtes en chrome—cobalt toutes de diamètre 22,2 mm. Le recul moyen était de 17,2 ans (12—20). L'âge moyen lors de l'implantation était de 54,8 ans (23—87). Nous avons étudié la survie à 15 ans de cette cupule par une méthode actuarielle avec un intervalle de confiance à 95 %. La survie globale de la prothèse à 15 ans était de 89,2 ± 8,7 %, la survie de la cupule à 15 ans était de 96,3 ± 3,7 %. L'absence d'accident de luxation au dernier recul confirme la stabilité à long terme de la double mobilité. La principale cause d'échec était la fixation de la cupule qui était non revêtue d'hydroxyapatite et sans macrostructure. La deuxième cause était la luxation intraprothétique dont on peut définir trois grands groupes : (1) la luxation intraprothétique intervenant dans un contexte d'usure pure avec un fonctionnement normal de la double mobilité ; (2) le deuxième type est la luxation intraprothétique intervenant dans le cadre d'un descellement acétabulaire avec effet de troisième corps et augmentation de l'usure de la rétention ; (3) enfin, le troisième groupe est la luxation intraprothétique qui est provoquée par un effet came dans le cadre d'une fibrose ou alors par un conflit sur une grosse calcification. Il n'existait que deux échecs fémoraux.

Introduction

Dual mobility sockets, developed in parallel with cementless implants, were introduced in 1974 by Professor Gilles Bousquet. As promotors of this idea, the Saint-Étienne Hospital Orthopedics Department was responsible for organizing the 2006 French Hip and Knee Society symposium, which aimed to provide a long-term assessment of this concept and to detail the indications and limitations of this method. Many publications have shown the advantages of the dual mobility socket, which substantially reduces the rate of intraprosthetic dislocation and therefore can be very useful in treating patients at a high-risk of postoperative instability [1—3]. Dual mobility also has a role to treat chronic instability [4,5]. We studied 15-year survival of a cementless dual mobility cup with cementless stems. This retrospective multicenter study was conducted on a consecutive and homogenous population of 438 primary total hip arthroplasties.

Material and methods

Patients

This retrospective multicenter study was conducted in four centers. The series studied was consecutive and homoge-