

The North American Experience with the “French Paradox” Technique in Total Hip Arthroplasty- Up to 5-year Follow-Up

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INTRODUCTION: Cement use in total hip arthroplasty (THA) is a topic of ongoing research and debate. The “French Paradox” cementing technique is a technique first described in European arthroplasty literature, in which a thin (<2mm) cement mantle is achieved by preparing the femoral canal only slightly larger than the femoral stem implant. This technique earned the ‘French Paradox’ name as a French-designed stem showed excellent long-term outcomes despite prior evidence that thin cement mantles can be prone to failure. This study seeks to describe the North American experience with femoral stems implanted with the controversial “French Paradox” thin cement mantle.

METHODS: This was a retrospective study of 125 patients who underwent primary, unilateral THA between 2020 and 2023 at two urban academic health systems with minimum 2-years follow-up. Demographic, implant, perioperative, and postoperative variables were collected. X-rays were manually reviewed to ensure implant and cementation technique. All patient charts were manually reviewed to verify no instances of femoral implant complication or failure. Chi-square, T-test, and ANOVA were used to assess statistical significance with a significance value of 0.05.

RESULTS: Of the 125 patients, 84% were female, 86% were white, and 5% were current smokers. Primary osteoarthritis (83%) was the most common indication for THA. The mean age of the cohort was 73, the mean Charlson Comorbidity Index (CCI) was 3.6, and 96% of patients had an ASA score of either II or III. Navigation was used in 70% of cases, with the rest being manual. There was one (0.8%) readmission within 90-days of surgery, which was sepsis of a gastrointestinal origin. There were two (1.6%) revisions, one for PJI and the other for acetabular cup loosening. There were no femoral stem complications, including no instances of loosening, periprosthetic fracture, or stem subsidence.

DISCUSSION AND CONCLUSION: The French Paradox technique demonstrates exceptional outcomes up to 5-years with no instances of loosening, subsidence, periprosthetic fracture, or femoral stem failure. This technique should remain a viable consideration for arthroplasty surgeons looking to utilize this technique with a thin cement mantle.

Table 1. Patient Demographics

	Hips (n=125)
Sex, n (%)	
Male	20 (16.0)
Female	105 (84.0)
Age, mean [SD] (min-max)	72.7 [6.6] (59-97)
BMI (kg/m ²), mean [SD] (min-max)	27.2 [3.6] (15-45)
CCI, mean [SD] (min-max)	3.6 [2.0] (0-9)
Race, n (%)	
White	107 (85.6)
African American	10 (8.0)
Asian	2 (1.6)
Unknown/Other	6 (4.8)
Smoking status, n (%)	
Current	5 (4.0)
Former	45 (36.0)
Never	75 (60.0)
ASA score, n (%)	
I	1 (0.8)
II	66 (52.8)
III	54 (43.2)
IV	4 (3.2)
Primary diagnosis, n (%)	
Primary OA	104 (83.2)
Fracture	18 (14.4)
Dysplasia	2 (1.6)
AVN	1 (0.8)
Use of Navigation/Robotics	
Manual	37 (29.6)
Navigation	88 (70.4)
Robotics	0 (0.0)
Femoral Stem Implant Type	
Exactech Altura	30 (24)
Smith & Nephew Polarstem	59 (47.2)
Zimmer Avenir	35 (28.8)

ASA: American Society of Anesthesiologists; BMI: Body mass index; CCI: Charlson Comorbidity Index; OA: Osteoarthritis; AVN: Avascular necrosis.

Table 2. Clinical Outcomes

Complication	Incidence (n=125)
90-day Readmissions	1 (0.8)
Myocardial Infarction	0 (0.0)
Pulmonary Embolism	0 (0.0)
Sepsis (Gastrointestinal origin)	1 (0.8)
Trauma	0 (0.0)
All-Cause Revisions	2 (1.6)
Acetabular Cup Loosening	1 (0.8)
Dislocations	0 (0.0)
Periprosthetic Joint Infection	1 (0.8)
Femoral Stem Complications	0 (0.0)
Femoral Stem Loosening	0 (0.0)
Periprosthetic Fracture	0 (0.0)
Subsidence	0 (0.0)