

# High Rates of Conversion to Total Hip Arthroplasty after Core Decompression for Avascular Necrosis of the Hip

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## INTRODUCTION:

Avascular necrosis (AVN) of the hip is caused by interruption of blood flow to the femoral head, resulting in pain, loss of joint function, and eventual hip arthritis. Core decompression may be performed for early AVN with a goal of improving symptoms and potentially delaying the need for total hip arthroplasty (THA). The effectiveness of this procedure is generally not well understood given the relatively rare nature of hip AVN. The predictors of conversion to THA after core decompression are not well defined. Core decompression is also not without potentially devastating complications, including femoral neck fractures, though estimation of true incidence of complications has been limited by sample sizes in prior investigations. The purpose of this study is to utilize a large payor database to determine time to THA after core decompression, assess predictors of early conversion to THA, and to examine complications after hip core decompressions. We hypothesize that less than 25% of patients who had a hip core decompression will convert to THA at two-year follow up; we also hypothesize that age at time of core decompression will be a predictor of conversion to THA.

## METHODS:

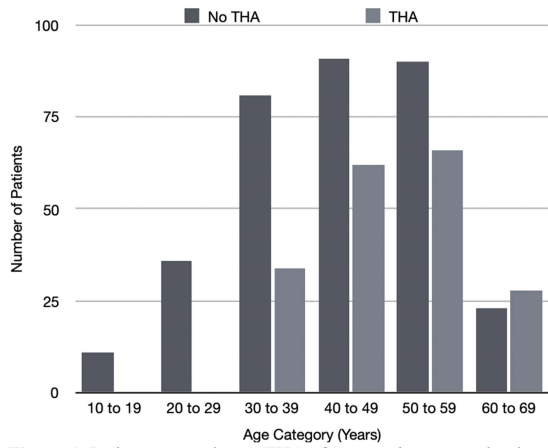
Using Current Procedural Terminology codes, we queried a large national insurance dataset for patients who underwent hip core decompression from 2010 to 2020. Patient demographics were recorded and subsequent THA conversion within 2 years after surgery were tracked. Patient demographic factors, including, age, sex, obesity, diabetes, prior fractures, steroid use, tobacco use, or alcohol use, were evaluated as possible predictors of early conversion to THA. International Classification of Diseases, codes were used to identify complications at 90 days and 2 years after core decompression. Multiple linear regression was used to test if the patient demographics significantly predicted conversion to THA and a Cox-Survival plot was performed. Statistical significance was defined as  $p < .05$ .

## RESULTS:

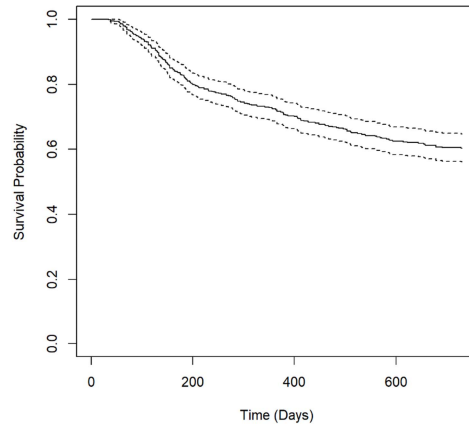
Between 2010-2020, 555 patients underwent hip core decompression. Within 2 years of core decompression, 209 patients converted to THA (37.6%) and one patient converted to hemiarthroplasty. Average age for patients converting to THA was 47.7 years compared to those who did not convert 43.4 (95% CI 2.1 – 6.2 years,  $p < .001$ ). Most patients who converted to a THA were between age 50-59 (**Figure 1**). Age was the only risk factor for conversion to THA as the following variables were not associated: Sex, obesity, diabetes, prior fracture, steroid use, tobacco use, or alcohol use. Cox survival plot demonstrated a high risk of conversion to THA within two years of core decompression with the highest risk within the first 200-days (**Figure 2**). Ninety-day complication rate was 2.9% and the complication rate at 2 years was 5.2%. The most common complication was femoral neck fracture at both timepoints (68.7% of complications at 90 days and 75.9% at 2 years). There was no significant difference in demographics between those that had complications and those that did not at 90 days. At 2 years after surgery patients that smoked (OR 0.39  $p = .02$ ) or had a prior fracture (OR 0.23;  $p = .02$ ) were more likely to have had complications.

## DISCUSSION AND CONCLUSION:

There is a high failure rate following core decompression for hip AVN with over one third of patients converting to THA within 2 years. Patients older than age 50 had the highest rates of conversion to THA. While the overall complication rate is low at 90 days and 2 years, patients should be counseled regarding the risk for femoral neck fracture. Further research is needed regarding predictors of success after core decompression.



**Figure 1.** Patient conversion to THA after core decompression by age group. Note: categories <29 for THA and >69 years for THA and no THA had less than 10 patients.



**Figure 2.** Cox Survival Probability plot two years after core decompression ( $p < .001$ ).