

## 5.1 Risk Factors for Dislocation after Total Hip Arthroplasty: Results of a Long Term Analysis

D. J. Berry

### Part I: The Cumulative Long-Term Risk of Dislocation after Primary Charnley Total Hip Arthroplasty

#### Introduction

A wide variable prevalence of dislocation after total hip arthroplasty (THA) has been reported, partly because of the variable lengths of follow-up for this specific endpoint. The effect of patient demographic factors on long-term risk of dislocation as a function of time after THA has not been well understood. The purpose of this study was to determine the risk of dislocation following cemented Charnley total hip arthroplasty with a 22 mm head size as a function of time and to investigate the patient demographic factors that influence the cumulative dislocation risk and time dependency of dislocation risk.

#### Materials and Methods

6621 consecutive primary Charnley THA performed in 2868 women and 2589 men (mean age 63 years, range 13-95 years) were performed at one institution between 1969 and 1984. Patients were followed at routine intervals and specifically queried about dislocation. The cumulative risk of dislocation was calculated using the Kaplan-Meier method.

#### Results

320 of the hips (4.8%) dislocated. The cumulative risk of a first time dislocation was 1% at one month, 1.9% at one year and then rose at a constant rate of approximately 1% every five years (0.2% per year) to 7% at 25 years for patients that were alive and unrevised at that time. In a multivariate analysis, the relative risk of dislocation for female (versus male) patients was 2.1, and for patients greater than or equal to 70 (compared to those less than 70) was 1.3. Three underlying diagnosis groups had a significantly higher risk of dislocation than osteoarthritis: osteonecrosis of the femoral head, acute or nonunited fracture of the proximal femur, and inflammatory arthritis.

#### Conclusions

The cumulative long-term risk of dislocation after THA is considerably greater than reported in short-term studies. The incidence of dislocation is highest in the first year after arthroplasty then continues at a relatively constant level for the life of the arthroplasty. Patients at highest risk are women and patients with a diagnosis of osteonecrosis of the femoral head or acute or nonunited proximal femur fracture.

**Reference**

Berry DJ; von Knoch M; Schleck CD; Harmsen WS: The Cumulative Long-Term Risk of Dislocation after Primary Charnley Total Hip Arthroplasty. *J Bone Joint Surg Am*, January 2004.

**Part II: The Long-Term Cumulative Risk of Dislocation After Primary Total Hip Arthroplasty: Effect of Femoral Head Size and Operative Approach****Purpose**

To determine the effect of femoral head size and operative approach on long-term cumulative risk of dislocation after primary THA.

**Materials and Methods**

From 1969-1999, 22,174 primary THAs were performed at a single institution. Patients routinely were followed at defined intervals and specifically queried about dislocation. Operative approach was anterolateral in 10,186, posterolateral in 3710, and transtrochanteric in 8278. Femoral head size was 22 mm in 8641, 26 mm in 1123, 28 mm in 8791, and 32 mm in 3515.

**Results**

918 of 22,174 hips (4.1%) had at least one dislocation. The cumulative risk of dislocation for the whole group was 2.2% at one year, 3% at five years, and 6% at 20 years. The cumulative 15-year risk of dislocation was 4.2% for anterolateral, 7.9% for posterolateral (Hazard ratio 2.2), and 4.5% for transtrochanteric approach (Hazard ratio 1.1) ( $p < 0.001$ ). The ten-year cumulative probability of at least one dislocation for the anterior approach was 3.9% for the 22 mm heads, 3.0% for 28 mm heads, and 2.4% for 32 mm heads, and for the posterior approach was 12.2% for the 22 mm heads, 6.9% for 28 mm heads, and 3.5% for 32 mm heads.

In the multivariate model the hazard ratio for dislocation for 22 mm heads compared to 32 mm heads was 1.7 (95% confidence interval, 1.4 to 2.2;  $p < 0.0001$ ); for 28 mm heads compared to 32 mm heads was 1.3 (95% confidence interval, 1.0 to 1.6;  $p = 0.025$ ).

**Conclusions**

This paper demonstrates that for the 22, 28, and 32 mm femoral heads, larger head size was associated with a lower risk of first time hip dislocation. The posterior approach has a higher dislocation risk than anterolateral or transtrochanteric approach.

**Reference**

Berry DJ; von Knoch M; Harmsen WS: Presented at the American Academy of Orthopaedic Surgeons annual meeting, 2003.