

## **Does the Use of Lipped Polyethylene Liners Affect Survival in Primary Hip Arthroplasty? A Registry Study of 14,098 Implants**

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### **INTRODUCTION:**

Total hip arthroplasty (THA) has transformed the management of degenerative hip conditions, significantly improving patients' quality of life. However, implant instability accounts for up to 22.5% of surgical revisions. Lipped liners (LL) were introduced to enhance implant stability, though they are associated with higher risks of impingement, polyethylene wear, and mechanical complications. Existing literature provides conflicting evidence regarding their survival compared to flat liners (FL). This study investigates the impact of LL versus FL on implant survival in uncemented primary THA, with a focus on mechanical complications.

### **METHODS:**

A total of 14,098 uncemented primary THAs performed between 2000 and 2021 were analyzed using data from the Emilia-Romagna Regional Registry of Orthopedic Prosthetic Implants (RIPO). Patients were divided into two groups: 7,385 received FL and 6,713 received LL. Implant survival was assessed using Kaplan–Meier analysis, with mechanical failure (dislocation, aseptic loosening, polyethylene wear) as the primary endpoint. Cox regression was used to adjust for confounding variables including age, sex, femoral head size, and implant material.

**RESULTS:** LLs were associated with a significantly higher revision rate than FLs ( $p = 0.031$ ). At 15 years, survival was 96.9% for FL and 96.0% for LL ( $p < 0.001$ ). Mechanical complications were the leading cause of failure in the LL group, with a higher risk of revision due to dislocation (28.5% vs. 18.4%,  $p = 0.019$ ) and aseptic loosening (19.4% vs. 14.0%,  $p = 0.041$ ). Cox regression confirmed a 1.54-fold increased risk of revision for mechanical complications in LL implants compared to FL (HR = 1.54, 95% CI 1.05–2.25,  $p = 0.026$ ).

**DISCUSSION AND CONCLUSION:** This registry-based study shows that LLs are associated with a higher risk of mechanical complications and revision compared to FLs. While LLs may enhance stability in selected cases, their benefits strongly depend on proper cup orientation and implant positioning. The use of LLs should be carefully considered based on the individual patient's needs to optimize implant survival and minimize complications.