Spinal Surgery and the Risk of Reoperation following Total Hip Arthroplasty in a Swedish Population: A Nationwide Prospective Registry Study

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INTRODUCTION:

The Hip-Spine syndrome, introduced in 1983 by Offierski and MacNab, is used to describe the concurrent degenerative pathology in the hip and lumbar spine. The coexistence of lumbar spinal stenosis (LSS) and hip osteoarthritis is a common encounter in clinical praxis. Estimated 18% of patients with total hip arthroplasty (THA) have a concurrent lumbar spine disorder. In Sweden, it has been demonstrated that 3.5% of patients with THA have had previous lumbar spine surgery. Furthermore, it is estimated that primary THA procedures will have increased by 129% between the years 2014 to 2030, and LSS is already today the most common indication for spinal surgery.

Recent studies have shown an increased risk of dislocation and revision of THA in patients with prior spinal fusion. Preexisting lumbar surgery in THA patients has also been reported to have worse patient-reported outcomes such as pain and quality of life (as compared to those without any history of spinal surgery).

Due to the overlap of symptoms of pain, correct diagnosis and treatment is a challenge for clinicians. There is a lack of consensus in defining which degenerative disease is primary, and which surgical treatment has priority.

Although studies have shown an increased risk of instability and higher revision rates of THA in spinal fused patients, few studies include lumbar decompression surgery (LDS). This is important since not all patients with LSS that undergo surgery are in the need of a spinal fusion, and recent evidence supports that only a few individuals are in the need of a spinal fusion. The aims of this investigation were 1) to investigate if there is a difference in risk of reoperation of the THA if LDS is performed before or after THA. 2) Is there a difference in mortality between those patients who had THA and LDS or THA only. 3) Subanalysis if fusion surgery combined with LDS increases risk for reoperation of the THA.

METHODS:

For this ethical review board approved study we obtained demographic-, surgical-, mortality-data along with data on reoperation of the THA on patients with both LDS and THR due to degenerative diseases. Data was obtained and linked from the Swedish Hip Arthroplasty Register (SHAR), the Swedish Spine Register (Swespine), and the Common Health Care register (Socialstyrelsens patient register) from 2000 until 2021. The two groups were compared to matched THA-only controls. Descriptive statistics were summarized in tables. Means and standard deviation (SD) were used to present continuous variables and numbers (%) were used for categorical variables. P-values for categorical values were calculated with chi-squared test. The cumulative mortality rate and the cumulative reoperation rate was assessed using the Kaplan-Meier method, presented as curves with a 95% confidence interval. Further comparisons of the risk of reoperation between patients receiving spinal surgery before or after THA and patients receiving THA only were made using binary multivariate logistic regression models, presented in tables as odds ratio with a 95% confidence interval. To minimize the influence of death as a confounder, regression results were based on a selection where all patients had a follow-up period of a minimum of 5 and 10 years.

RESULTS:

We identified two groups: patients undergoing LDS before (n=3,892) or after (n=4,016) THA. (Figure 1). Higher reoperation rates were seen when LDS decompression surgery was performed before THA compared to THA-only (2% vs. 1%, $p<0.001$). No difference was seen in LDS after THA (3% vs. 3%, $p=0.08$) (Table 1). Logistic regression showed higher risk of reoperation after 5 years in LDS before THA (OR=1.79,95%CI=1.26-2.46, $p=0.001$). Higher absolute risk of reoperation was seen when LDS was performed after THA compared to before. Mortality was lower in patients undergoing both LDS surgery and THA, regardless of procedure order. Patients with lumbar fusion surgery had a higher risk of reoperation when performed after THA 6.6% vs. 3.1%, compared to before THA 2.5% vs. 2.5%. However, cox regression presented no higher risk for reoperation regardless of order (C=0.404759, P=0.0572).

DISCUSSION AND CONCLUSION:

This retrospective register-based study showed that patients undergoing THA with preexisting LDS had an increased risk of reoperation in the prosthetic hip compared to patients only receiving a THA. Reoperation rates did not differ between patients receiving spinal surgery after THA and THA-only. Higher absolute risk of reoperation was seen when decompression was performed after THA compared to before, and decompression and fusion showed a higher number of reoperations when performed after THA. Fusion procedure combined with LDS showed no higher risk of reoperation of the THA.

Patients with both THA and spinal surgery had substantially higher survival compared to patients with THA only, regardless of the order of procedures.

If there is an indication to undergo both procedures, and it is not possible to determine what location is most symptomatic, our results suggest that lumbar decompression surgery be performed before THA. However, further studies are needed to investigate complications such as risk for reoperation of the lumbar spine in patients with both procedures.