Outcomes Following Lumbar Fusion in Patients with Systemic Lupus Erythematosus Abstract

Study Design - Retrospective cohort study

Objective - The aim of this study was to investigate the outcomes and complications after lumbar fusion surgery in patients with systemic lupus erythematosus (SLE). A secondary aim was to determine the impact of immunomodulatory (IMT) agents on outcomes following lumbar fusion in the lupus cohort.

Summary of Background Data - Existing literature suggests that patients with SLE experience increased risk of complications and hospital-related expenditures after surgery. To date, there is limited knowledge on the impact of SLE on outcomes after lumbar fusion.

Methods - Patients over 18 years old who underwent a primary lumbar fusion from 2010 to 2022 were identified by PearlDiver multipayer database. Patients were assessed for age, gender, and Elixhauser Comorbidity Index (ECI) and matched in a 1:4 ratio based on diagnosis of SLE. Patients in both cohorts were evaluated for medical and surgical complications, postoperative healthcare utilization rates, need for revision surgery, as well as two-year mortality. A subgroup analysis was then performed between patients diagnosed with SLE with and without a history of immunomodulatory therapy (IMT).

Results - Patients with SLE experienced more medical complications including arrhythmia (OR 2.34, 95% CI 1.85-2.96, p<0.001), myocardial infarction (OR 2.89, 95% CI 1.33-6.09, p=0.006), cerebrovascular accident (OR 5.07, 95% CI 2.47-10.58, p<0.001), respiratory failure (OR 3.15, 95% CI 1.86-5.29, p<0.001), urinary tract infection (OR 3.43, 95% CI 2.69-4.37, p<0.001), renal

failure (OR 2.69, 95% CI 1.83-3.91, p<0.001), and sepsis (OR 2.42, 95% CI 1.14-4.93,

p=0.017). SLE was also associated with higher healthcare utilization—including emergency department (ED) visits (OR 7.27, 95% CI 5.75-9.21, p<0.001) and inpatient readmissions (OR 2.97, 95% CI 2.44-3.62, p<0.001)—at 90 days postoperatively, as well as higher surgical complications at two years—including pseudoarthrosis (OR 3.20, 95% CI 2.01-5.04, p<0.001) and revision surgery (OR 2.90, 95% CI 2.15-3.88, p<0.001). Patients with SLE on IMT had higher rates of ED visit at 30 days (OR 1.60 95% CI 1.01-2.57, p=0.049) and pseudoarthrosis at two years after surgery (OR 2.54, 95% CI 1.06-7.09, p=0.049), but lower rates of revision compared to those not on IMT (OR 0.56, 95% CI 0.38-0.56, p=0.017).

Conclusions - Patients with SLE experienced higher rates of medical and surgical complications after lumbar fusion surgery. Further research is needed to determine mitigation strategies and to understand perioperative risks associated with immunotherapy agents in patients with SLE.