National trends in the surgical management of lumbar facet cysts: A national database study

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INTRODUCTION:
Lumbar facet cysts can contribute to stenosis and radiculopathy. While non-operative management is a first line treatment of patients with such cysts, a subset of patients may be candidates for surgical intervention. This may be decompression (D) alone or decompression with fusion (D+F). However, the use of one modality versus the other remains a topic of discussion. As such, the current study utilized a large, national, 2010 to 2022 administrative database to determine yearly rates of D versus D+F utilization, independent predictors of D+F relative to D, 90-day overall costs (measured by insurer-payments), and 5-year survival to reoperation.

METHODS:
The 2010–2022 PearlDiver M170 database was queried for adult patients (>17 years of age) who underwent D or D+F with a same-day diagnosis of a lumbar facet synovial cyst. Exclusion criteria included multilevel fusion, coded infection, trauma, or neoplasm related to the spine within 90 days prior to surgery, and database inactivity within 90 days following surgery.

Calendar year incidence rates were assessed and trended with linear regression. Next, multivariable logistic regression was conducted to identify independent predictors of D+F relative to D alone. Ninety-day postoperative insurer-payments were also assessed and compared.

To determine 5-year survival to subsequent lumbar reoperations, a 1:1 match controlling for age, sex, Elixhauser comorbidity index, spondylolisthesis, and preoperative smoker status was completed for the two groups. Kaplan-Meier curves were created and compared with log-rank test. Significance was defined as $p < 0.00063$, as per Bonferroni correction.

RESULTS:
A total of 45,380 patients with surgically managed lumbar facet cysts were identified, of which D alone was performed for 33,988 (74.9%) and D+F for 11,392 (25.1%). The incidence of both procedures increased over the years of the study ($p<0.0001$), with decompression with fusion rising at a greater rate such that D+F rose from 22.9% in 2010 to 29.4% in 2022 ($p=0.0006$).

Multivariable analysis found D+F to be independently more likely for those with older age (odds ratio [OR]=1.13), female sex (OR=1.26), higher ECI (OR=1.11), spondylolisthesis (OR=3.21), and orthopaedic surgeon (relative to neurological surgeon, OR=1.38) ($p<0.0001$ for all). Ninety-day overall insurer-payments were greater for D+F versus D (median \$7,744 versus \$3,731, $p<0.0001$).

Five-year survival to reoperation was not found to be different between the two groups. At 5 years, the D group had 91.5% without subsequent lumbar operation and the D+F group had 90.6% ($p=0.6000$).

DISCUSSION:
While decompression alone was the most common surgical intervention for lumbar facet cysts in this large cohort study, the rate of decompression with fusion increased over the study period. Factors predictive of decompression with fusion were demographic (older/sicker patients), spondylolisthesis (as expected), and surgeon specialty (orthopaedic surgeons being more likely to fuse), suggesting non-clinical factors contribute to decisions. The greater costs associated with fusion and lack of difference in subsequent 5-year reoperations support current practice patterns.

SIGNIFICANCE/CLINICAL RELEVANCE:
The findings of the current study highlight a gradual national shift toward increasing lumbar facet synovial cyst surgery, with certain clinical and non-clinical factors identified to be associated with D+F relative to D alone. While the subsequent surgery rate was similar for the two groups, identifying patients most likely to benefit from D+F may optimize outcomes and resource utilization on a national level.