Calcium Pyrophosphate Deposition Disease (Pseudogout) of the Lumbar Spine Predisposes to Higher Rates of Dural Tears and 90-Day Reoperations: Results of a Propensity Matched Analysis

David O. Osei-Hwedieh[1], Mitchell Fourman[2], Tom Maarten De Groot, David Shin[3], Joseph Hasbrouck Schwab[4]
[1]Orthopaedic Surgery, Massachusetts General Hospital, [2]Hospital for Special Surgery, [3]Massachusetts General Hospital, [4]MGH Dept. of Ortho Surg.

INTRODUCTION:

Calcium pyrophosphate deposition disease (CPPD), or pseudogout, is a crystal deposition arthropathy involving synovial and periarticular tissues whose clinical manifestations can range from no symptoms to chronic inflammatory arthritis. CPPD is less commonly reported in the spine than in the appendicular skeleton because it is often mistaken for the manifestations of degenerative joint disease or misdiagnosed as a neoplasm. In our experience, patients with suspected CPPD deposition in the lumbar spine have significant scarring, tophaceous deposits and complex dural adhesions that complicates surgical decompression. We hypothesized that patients with CPPD who undergo a lumbar decompression secondary to stenosis have higher rates of durotomies, 90-day readmissions and 90-day unplanned returns to the OR compared with matched institutional controls.

METHODS:

A retrospective analysis of patients who underwent a lumbar decompression at a single large academic medical center from 1/1/2001 to 1/31/2022 was performed. Inclusion criteria were patients 18 years and older who underwent operative treatment a posterior decompression for lumbar stenosis. Patients with pathologic confirmation of pseudogout of the lumbar spine as determined using samples obtained intraoperatively were assessed as the experimental group, while an institutional comparison group was generated via propensity score matching using one-to-one nearest-neighbor matching in a random order without replacement and a caliper fixed at 0.005 (maximum allowable difference in propensity scores) based on a propensity score calculated through a logistic regression model that included age, sex and body mass index. The primary outcome was 90-day return to OR. Secondary outcomes were incidental durotomies, surgical site infections, 90-day readmissions and comorbidities, which were defined using the Charlson comorbidity index, smoking status, hypothyroidism, previously diagnosed gout and nephrolithiasis. Statistical comparisons were performed using an unpaired t-test or Fisher's Exact test as indicated, with $p<0.05$ considered statistically significant.

RESULTS:

A total of 139 patients were diagnosed with CPPD based on operative pathology, and were propensity matched with 139 patients without a CPPD diagnosis. No differences were observed between groups in smoking status, Charlson co-morbidity index, hypothyroidism, or nephrolithiasis. Patients with CPPD had a significantly higher incidence of dural tears (26/139, 18.7% of CPPD vs. 11/139, 7.9% of non-CPPD, p = 0.0029) and 90-day returns to the OR (15/139, 10.8% of CPPD vs. 5/139, 3.6% of non-CPPD, p = 0.02), but equivalent all-cause 90-day readmission rates (17 / 139, 12.2% of CPPD vs. 12 / 139, 8.6% of non-CPPD, p = 0.3). There was no difference in the incidence of surgical site infections between groups.

DISCUSSION AND CONCLUSION:

CPPD of the lumbar spine is associated with a higher incidence of durotomies and 90-day return to the OR in a propensity-matched comparison. Readmissions were equivalent between CPPD vs. non-CPPD patients, suggesting that this pathology does not represent greater systemic dysfunction in these patients.