

10) TITLE: Synovial cyst injection study yields different results comparing retrospective chart review and prospective study designs: Why spine research should avoid retrospective chart reviews

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INTRODUCTION: Lumbar synovial cysts are benign degenerative abnormalities and can lead to neurogenic claudication or sciatica if associated with stenosis or nerve root compression. Previous reports have suggested epidural steroid injection or surgical excision as reasonable treatment alternatives. Attempted cyst rupture with a percutaneous steroid injection is a treatment option that has been developed by one of the neuroradiologists at this institution, but there has been no systematic evaluation of this treatment option. The purpose of this study is to evaluate this treatment option using medical chart review and prospective study designs.

OBJECTIVE: We hypothesize that both retrospective chart review and prospective study designs will reveal that treatment with percutaneous cyst rupture delays the need for surgery or eliminates the need for surgery altogether.

METHODS: From 2001-2006, 127 patients were identified who were treated for lumbar facet joint synovial cysts with fluoroscopically-guided corticosteroid facet joint injection and attempted cyst rupture. Medical chart review was performed in October 2006 and a prospective cross-sectional study by telephone and mail was implemented in February 2007. The outcome measure was time to surgical intervention. In the prospective study we also collected: (a) retrospective pre-treatment pain and disability (using Numerical Rating Scale items and the Oswestry Disability Index, respectively); and (b) current pain and disability. Cox Proportional Hazards and logistic regression modeling evaluated risk factors for surgery. The different samples were compared to understand what biases were represented by the two designs, using t-tests, Mann Whitney U, and Fisher's Exact statistics.

RESULTS: The chart review and prospective studies yielded different results and had slightly different patient samples. There were 103 patients in both studies, but they were different subsets of the total sample. Patients excluded from the retrospective chart review were lacking any information following the index injection (e.g., surgery status). Patients excluded from the prospective study had obsolete contact information. A comparison of the two samples revealed that older patients (≥ 70) and patients whose index injection was less recent were less likely to be included in the prospective sample (difference in median age=6.7 yr, $p=0.067$; difference in median date of injection=1.69 yr, $p=0.004$). Patients with cysts at L5-S1 were less likely to be in the prospective sample, but this co-varied with being older (1-sided Fisher's Exact $p=0.047$). Although body mass index (BMI) was missing in 40% of medical records, there was minimal difference in retrospectively-reported BMI between patients with and without BMI in their record (difference=0.08 kg/m^2 , $p=0.93$).

The prospective study identified some inaccuracies and many missing data points in the chart review data. The chart review also indicated that successful rupture of L5-S1 level cysts reduced the risk of surgery (Hazard ratio = 0.29, $p<0.006$). The prospective study did not confirm this level-by-rupture interaction and found that cyst rupture had no impact on risk of surgery. The prospective study also revealed that 55 (54%) patients required surgery after injection treatment ($m=8.4$ mo. later). All patients reported significant improvement in back pain, leg pain and disability at 3.2 years post-injection, regardless of their subsequent treatment course ($p<0.0001$). The risk of having surgery was higher among those who had two or more injections (OR=3.29, $p<0.002$) and those reporting a pre-treatment disability above the median value of 46 (OR=1.83, $p<0.04$).

CONCLUSION: This study presents the largest clinical series of nonsurgical treatment for lumbar facet joint synovial cysts and highlights differences between chart review and prospective studies, both in findings and in sample representation. Prospective data collection was useful not only for providing previously missing information and correcting misinformation, but also allowed for systematic collection of patient-reported outcomes. The latter may provide the basis for guidelines to target patients who are less likely to benefit from non-surgical intervention and/or limiting the use of such interventions. Care should be taken, however, to maintain current contact information especially for older patients.

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