Retrospective Review of Patients Undergoing Endoscopic Spinal Decompression from an Academic Pain Program

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Introduction

Background/Rationale

Spinal Stenosis is a chronic debilitating condition that affects up to 9.3% of people, most commonly in the sixth or seventh decade of life[1]. The number of people affected is expected to increase with an aging population and is predicted to reach 64 million within the decade[2]. These patients are often referred to interventional pain specialists, with symptoms concerning for neurogenic claudication. Interventional pain specialists may utilize a variety of interventions to help treat the pain including, epidural steroid injections, percutaneous image-guided minimally invasive lumbar decompression or interspinous spacer placement. If these are unable to provide durable relief, these patients are typically given the option for referral to spine surgery or conservative management with medications and physical therapy. Surgical intervention for spinal stenosis traditionally include decompression by soft tissues & intervertebral disc dissection/debulking and surgical removal of bony structures. In the long-term, patients may develop facet joint and spine destabilization needing more surgeries and there could be a protracted recovery process. An emerging alternative has been developed to address the needs of this population of patients in the form of endoscopic spine surgery (ESS). Advantages to ESS include minimal tissue trauma, decreased risk of damage to the neural structures and epidural vessels with decrease in subsequent epidural fibrosis/scarring, reduced hospital stay, early functional recovery and improved cosmetic outcome[3,4]

Methods

Study Design

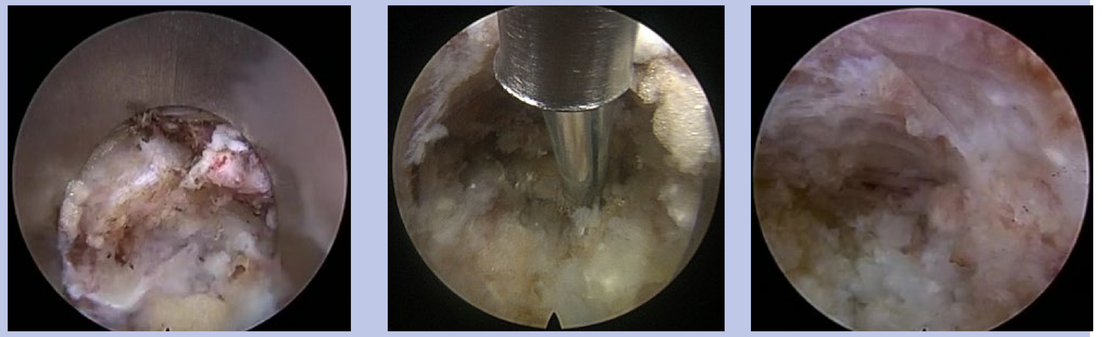
A retrospective electronic medical record review was performed of 22 patients undergoing endoscopic spine decompression between 7/1/2019 and 6/1/2020 performed by UF Health Pain Medicine physicians following IRB approval (IRB# 202001529). Data were extracted from electronic medical records from the Epic electronic health record by three members of the study staff who underwent training to standardize data collection methods.

Results

Outcome data from the 20 cases were collected and results are highlighted in Table 1. Preoperatively, patients reported an average typical pain score of 7.2 (SD = 1.4) and an average maximum pain score of 8.7 (SD = 1.2). Postoperatively, patients reported an average percent pain improvement of 82% (SD = 31) with an average postoperative typical pain score of 1.8 (SD = 2.8) and an average maximum pain score of 2.8 (SD = 3.8). Average change in pain score was -5.4 (SD = 2.8) for typical pain score and -5.9 (3.6) for maximum pain score. Average opioid dose was 18 (SD = 26) preoperatively, and 14 (SD = 22) postoperatively.

Endoscopic Decompression

Advantages to ESS include minimal tissue trauma, decreased risk of damage to the neural structures and epidural vessels with decrease in subsequent epidural fibrosis/scarring, reduced hospital stay, early functional recovery and improved cosmetic outcome.



-Endoscopic images of the transforaminal approach to the epidural space.

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Discussion

First surfacing in the late 1980's, full endoscopic decompression technique for lumbar pathology as a minimally invasive option, has evolved into a standard of care at some institutions due to the demonstrated efficacy and safety of this technique[6]. Over the years this technique has become further refined with the additions of continuous irrigation, optimization of approach angle, and instrument development[7]. These developments improve visualization and bone resection allow for the safe treatment of lumbar spinal stenosis under full endoscopic technique with equivocal effectiveness to conventional techniques[7].Conventional decompression with laminectomy or extensive resection can lead to a variety of undesirable outcomes including increased blood loss requiring transfusion of blood products, complications related to general anesthesia, need for invasive monitoring, and increased hospital stay. The five year outcomes of conventional open surgical decompression have demonstrated several complications including deterioration of function, infection, and recurrence of symptoms[8]. In addition, this operation can lead to epidural scarring which can become symptomatic to the patient and complicate future revisions[9]. Another undesirable outcome could be tethering of the cauda equina caused by connections forming between the epidural space and paravertebral musculature post-operatively. Finally, open resection carries a risk of postoperative inter-segmental instability if aggressive resection is required[10]. Full endoscopic decompression can provide reduced tissue trauma, preserved stability, reduced rehabilitation time, and minimal scarring, while maintaining equal efficacy to more established procedures such as direct and microscopic decompression.