Low Rates of Adjacent Segment Disease and Reoperation Following Minimally Invasive Laminectomy With In Situ Posterior Fusion for Lumbar Stenosis

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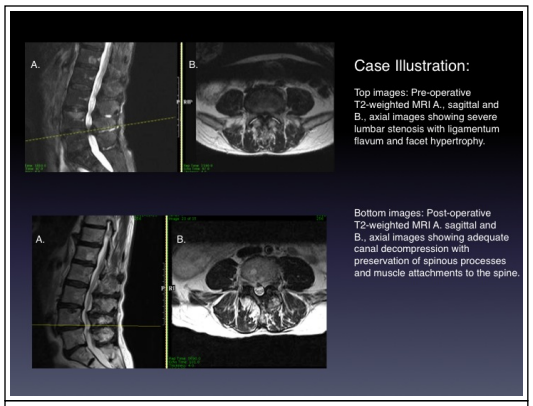
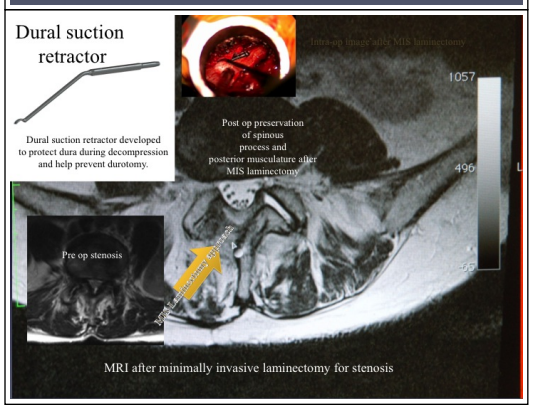
Introduction

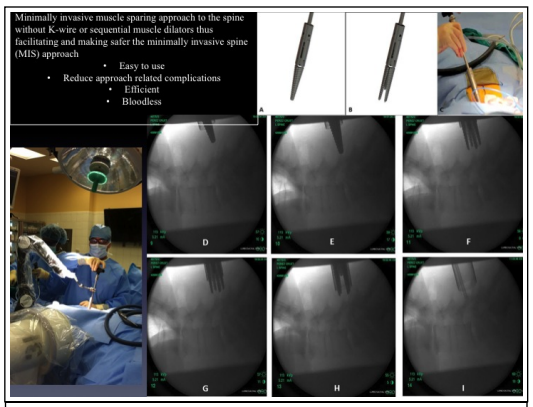
laminectomy with or without lumbar fusion has been used to reduce chronic low back pain caused by lumbar stenosis. However, these procedures are often associated with the development of adjacent segment disease (ASD), which is loosely defined as a constellation of symptomatic radiculopathy, stenosis, and instability that occurs at a level adjacent to previous open laminectomy. Minimally invasive laminectomy with concomitant in situ fusion is an effective surgical treatment for lumbar spinal stenosis that preserve normal anatomy. This approach results in maximal preservation of the normal vertebral anatomy, which is inevitably disrupted in the open approach.). However, there are currently no data on the rates of ASD and subsequent reoperation regarding this particular technique. The goal of the study is to investigate the occurrence of clinical ASD and reoperation rates subsequent to minimally invasive laminectomy (MIL) with in situ posterior fusion (ISPF).



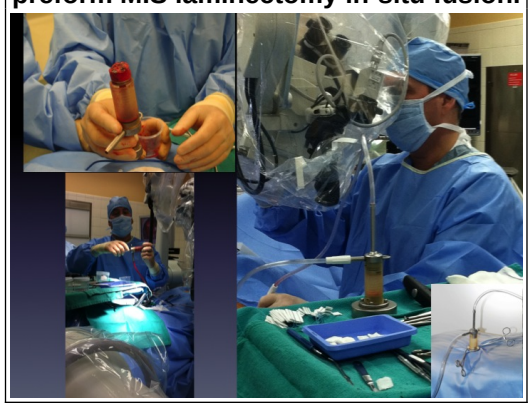


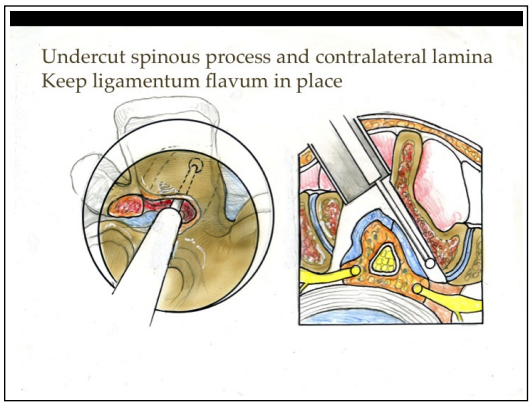
Methods

280 MIL with ISPF was performed on 155 consecutive patients with lumbar stenosis refractory to conventional treatments. Clinical ASD was defined as symptomatic radiculopathy, stenosis, and/or instability that occurred at a level immediately adjacent to the index foci =6 months after initial postoperative relief. Clinical outcomes were evaluated with Visual Analog Scale (VAS), Oswestry Disability Index (ODI), and Short Form-36 (SF-36) Physical and Mental Component Scores.



BoneBac autograph bone used to preform MIS laminectomy in-situ fusion.





Results

Recurrence of symptoms developed in 7 (4.5%) cases subsequently, 5 (3.2%) of which occurred at the same level as surgery. The other 2 (1.3%) occurred at the immediately superior levels and represented clinical ASD. Of these 7 recurrent cases, reoperation was carried out in 5 (3.2%) cases, with 4 (2.6%) requiring same-level surgery and 1 (0.6%) requiring adjacent segment surgery. 96 (61.9%) patients underwent contiguous multilevel surgery. 124 (80.0%) patients had been treated with analgesics or physical therapy prior to surgical intervention; this number was reduced to 16 (10.3%) after surgical intervention. 96 (61.9%) patients underwent contiguous multilevel surgery. 16 (10.3%) patients had concurrent cervical stenosis previously treated with cervical discectomy with and without fusion. 124 (80.0%) patients had been treated with analgesics or physical therapy prior to surgical intervention; this number was reduced to 16 (10.3%) after surgical intervention. At 24 months follow-up compared with preoperative baseline, VAS improved from 6.0 ± 2.5 to 3.6 ± 2.7(40%), ODI improved from 38 ± 13.1 to 22 ± 16.7(40.8%), SF-36 Mental Component improved from 46.9 ± 12.2 to 54 ± 11.0(13.1%), and SF-36 Physical Component improved from 30.5 ± 8.3 to 35.6 ± 7.9 (16.7%). All but one of these improvements exhibited statistical significance.

Conclusions

Muscle-sparing minimally invasive laminectomy with in situ fusion was associated with a low rate of clinical ASD (1.3%) and ASD-related reoperation (0.6%), while achieving successful postoperative outcomes. This reduction of ASD occurrence was likely accounted for by the minimally invasive approach which, compared with open procedures, promoted maximal preservation of paraspinal anatomy. MIL with PF therefore represents a favorable approach for lumbar stenosis to reduce ASD occurrence and minimize problems associated with repeated surgery.