

A Surgeon's Perspective: Laminectomy with Facet Fusion

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Facts & Figures

- More than 650,000 spine surgeries performed each year in the USA
- Most common diagnosis is Spinal Stenosis
- Most common treatment for Spinal Stenosis is Laminectomy
- Many Laminectomy patients progress to spondylolisthesis after surgery
- Up to 30% of Laminectomy patients undergo reoperation for spondylolisthesis
- Reoperation rate drops by half if fusion is performed with laminectomy
- Screw/rod instrumented fusion with pedicle screws is not warranted, when the intent is a simple decompression, due to high morbidity and invasiveness
- Bilateral facet fusion provides less invasive stabilization for laminectomy, without the morbidity of complex instrumented fusion
- Facet Bolts® can be implanted in minutes, without extension of wound or additional morbidity

Background

Over 650,000 spine surgeries are performed annually in the United States (SPORT) with the majority being decompressive laminectomies for Spinal Stenosis. Eighty percent of the population report having back pain, with >400,000/yr. diagnosed with Spinal Stenosis. The majority age group is 65. The diagnosis of Spinal Stenosis and therefore need for treatment is likely to escalate rapidly when US census data is applied. The US population of individuals >65 represented 12.4% (35M) in 2000 and is projected to represent 19.6 % (71M) by year 2030 (CDC).

The most common treatment for Spinal Stenosis involves a midline approach with a decompressive laminectomy to address the stenosis. Although highly effective in relieving the clauditory symptomatology, there is growing evidence and concern over the need for reoperation to address reoccurrence of symptoms related to progression of spondylolisthesis, or slippage, at the site of decompression. Slippage rates post surgery have been reported as high as 20% in "no preop slip" patients and from 40-100% in "preop slip present" patients (Johnsson Spine 86', 90').

The reoperation rate for each of these groups varies, and is dependent on many factors. Reported reoperation rates average around 18% for the "no preop slip" group and upwards of 30% for the "preop slip present" group. (Martin Spine 2008)

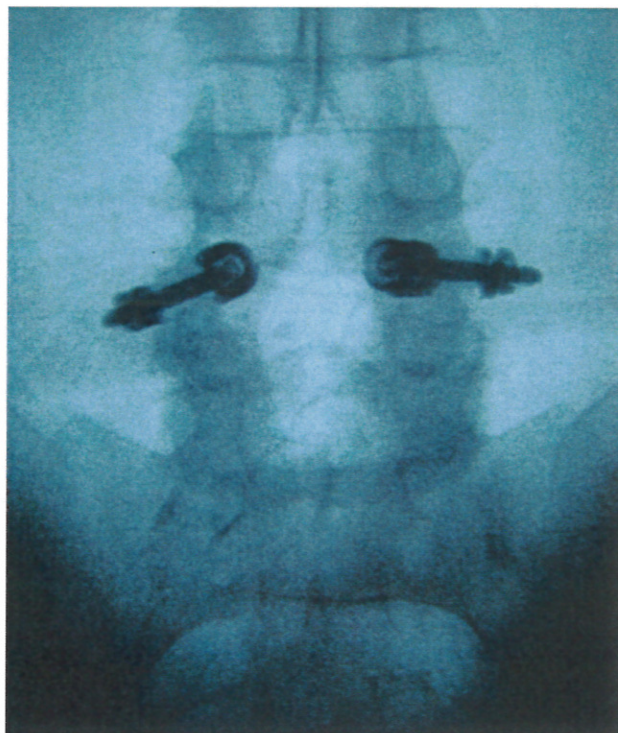
The concern for further slippage and need for reoperation has fostered a treatment method involving the use of dynamic or motion sparing devices placed without a fusion, to give some amount of "stiffness" to prevent further slippage and yet allow for some motion, avoid the excessive loading of adjacent segments and hopefully avoid adjacent segment disease. Such devices have been successful in limiting progression of slip in stable spine constructs, however there are recent reports of instrument failures (17%, Schwake et al, Spine 2006) and the need for revision surgery (Bothman et al, Neurosurgical Review, 2008) which defeats the attempt to limit reoperations. Furthermore, it is known and reported that adjacent segment disease continues similar to patients with rigid fusions (Kumar et al Spine 2008). The need to utilize pedicle screw technology and approaches with such dynamic systems makes the muscle trauma morbidity comparable to undergoing a fusion surgery with screws/rods.

A NEW Approach to a Growing Problem

The Facet Fixation System™ from Amedica/US Spine offers a minimal incision, minimal morbidity approach to the problem of post operative slippage with the development of the Facet Bolt®. This is a fusion/fixation technique that utilizes a very small standard midline approach, allowing the surgeon to work in their "comfort zone" for the midline partial laminectomy. The pars are preserved and up to 60% of the inferior facet is preserved to allow for a fusion and stabilization across the facet joint. The Facet Bolt is placed via the Facet Gun® from the opposite side of the table in a "triangular approach" minimizing the need for muscle retraction or dissection, often required to place "pedicle based" systems of stabilization. As an example, in approaching the L4/5 stenosis, a small 7 cm midline incision is made over the interval in question, soft tissue is removed off the spinous process and lamina to the facet joint. The decompression is carried out per routine with removal of a portion of the L4 and L5 spinous process and medial lamina structures. Following the decompression, soft tissue is removed over the L4/L5 facet joints. The capsule of the facet is removed and the facet joint cartilage is roughened up with the Anspach or similar high speed burr. The facet joint is then packed with bone graft, biologics, etc. The Facet Gun is then utilized to position a Facet Bolt across the opposite facet while soft tissue is retracted by the assistant with a Meyerding or similar small handheld retractor. The Facet Bolts are placed, C-arm or plain X-ray can be utilized to confirm position. The wound is irrigated and closed. Drain optional. Coding for the FDA approved Facet Bolt is identical to screw/rod fixation and posterior fusion techniques.

The Reason It Works...

The Facet Bolt is small but Mighty! The closer fixation is to the Center of Rotation (COR) the smaller and yet stronger it is. There is no "rod" per se like the pedicle screw/rod constructs, however it could be argued that the Facet Bolt harnesses the most physiologic rod



of all...the bone across the facet joint and the pars areas above and below the facets. This "living, dynamic rod" allows for some flex without loosening of the facet bolt. There is more "motion" than a rigid screw/rod construct but also present is a solid locking implant and fusion across the facet joints, the only true joint in the spine, thus preventing further slippage, facet joint pain, etc. Additional levels of decompression are all linked together through this "living bone rod construct".

Additional Options

For an even more rigid construct, in patients with greater instability, degenerative disc disease, etc. a PLIF can be added to the surgery, still preserving the lamina and facet construct. Alternatively, a TLIF procedure can be done, with pedicle screws/rod on the TLIF side and a Facet Bolt on the opposite side... a Hybrid construct.

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