Failed Back Surgery Syndrome: Endoscopic Documentation of Common Causes by visualization of Painful Patho-anatomy in the hidden zone of the axilla containing the Dorsal Root Ganglion and Salvage treatment of Neuropathic pain with DRG neuromodulation

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Introduction

Failed back surgery syndrome is a very loose term that has different meanings to different providers and specialists treating chronic lumbar pain. Surgeons label the term after failure to obtain their projected surgical results following traditional decompression surgery and / or fusion. There are painful patho-anatomic structures in the foramen not visualized by traditional surgeons. Therefore, rather than identifying a diagnosis of the etiology of the failure, surgeons simply label it “failed back surgery syndrome”. Even recurrent HNP is sometimes missed if small or in the “hidden” foraminal zone, even when it occurs after the surgeon has visually confirmed “complete” decompression of the herniated disc fragment or stenosis. These patients are often referred for “pain management”.

Interventional pain specialists focus on the neuromodulation of the spinal cord (SCS), or more recently the dorsal root ganglion (DRG). They use percutaneous neuromodulation to block pain pathways, depending on the gate theory. The two different specialties depend on divergent treatments without knowledge of the more specific reasons for surgical failure.

Method

Transforaminal endoscopic visualization of painful patho-anatomy treated by endoscopic decompression and ablation from a personal data base of over 10,000 procedures, serves as the basis for treating FBSS by focusing on the axilla of the foramen and the DRG.

Endoscopic visualization using transforaminal endoscopic approaches can identify and treat failed back surgery syndrome (FBSS) by isolating the source of pain with diagnostic and therapeutic injections, then surgically address the pain generator with endoscopic decompression and neuro-ablation, performed with the patient awake , using only mild sedation. The patient is able to provide symptom feedback during surgery. If there is neuropathic pain from a “battered” nerve root, injured by the degenerative or traumatic process, a salvage treatment method using wireless programmed neuromodulation, is now FDA approved is available for clinical use.

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Fig 2  Foraminoplasty of Kambin’s triangle to access the axilla

Figure 3  Endoscopic Decompression of the Axilla by resecting the tip of the SAP with a Kerrison rongeur

Figure 4  Endoscopic visualization of the axilla
Transformaminal decompression of the superior articular process provides access to the hidden zone of Mac Nab to the axilla of the foramen. These patho-anatomic pain generators findings are not normally seen by surgeons decompressing the spinal segment in using the translaminar approach. In the transfomaminal endoscopic approach, anomalous nerves and other findings in the axilla of the spinal segment produce pain when probed under local anesthesia and light sedation.

Representative Examples of endoscopic visualized patho-anatomy found in the Foramen

Axial MRI

Intra-operative cannula position

Decompressed Nerve

Osteophyte in foramen

Figure 5 Foraminal Osteophyte
Figure 6  Anomalous nerves
Figure 7 Synovial cysts

Incidental pedunculated synovial cysts

Figure 8 Neuroma of the dorsal ramus

neuroma adjacent to the exiting nerve
Figure 9  FBSS Total Disc Replacement

Scar and osteophyte in the axilla irritating the exiting nerve missed during Total Disc Replacement
Surgical Management and Pain Management

For Surgical Pain Management, the author’s method patent from visualization of the DRG as a pain generator resulted in a pilot study of a wireless neuromodulation device sponsored by Stimwave using an implantable wireless implant. This study using the “Freedom” electrode demonstrated favorable results for patients with residual neuropathic pain failing traditional surgical decompression and fusion. Five FBSS patients with multiple procedure histories, dissatisfactory back and leg pain following fusion or lumbar discectomy, were implanted with a wirelessly powered, SNS system percutaneously that was remotely powered and monitored. FDA 510 K approval followed when additional studies confirmed the pilot study results.
Results
All five patients reported successful stimulation as defined by at least 80% reduction in pain and 80% paresthesia coverage of the pre-operative pain distribution. Baseline VAS pain scores averaged 8.5. VAS at the end of the trial period averaged 2.3. Additional studies validating DRG neuromodulation and peripheral stimulation resulted in FDA approval using neuromodulation for neuropathic pain.

Surgically, The transforaminal endoscopic technique also allows surgical access to the lumbar spine for treatment of a wide spectrum of painful conditions in patients who had residual pain following a variety of traditional spine surgeries. Visualizing the pain generators responsible for FBSS are supported by case examples collected from a personal database of over 10,000 surgical cases over 25 years. Good surgical results are also obtained with intradiscal therapy using thermal discoplasty and annuloplasty with endoscopic decompression of the disc with symptom feedback from the patient during surgery.

Conclusion
Visualizing the patho-anatomy with an endoscope targeting the patho-anatomy by interventional needle trajectories, has opened the door for surgical decompression that traditional surgeons using translaminar decompression surgical techniques may miss due to the “hidden zone”.

For Interventional Pain, as a complement to endoscopic decompression of residual patho-anatomy, a wireless powered SNS fully implanted lead without an implantable pulse generator, or hermetically sealed RF receiver, enables a direct transforaminal implantation technique to be placed directly at pain generator locations or peripheral nerve modulation to achieve pain relief in FBSS patients with neuropathic pain.
Wireless SNS is a practical and simplified therapy that may provide a viable treatment option for chronic low back and/or leg pain from FBSS due to uncorrected, unrecognized pain in the region of the Dorsal Root Ganglion, or as a pain management modality can be utilized by both specialties. It can even be combined as a cost effective Hybrid surgical decompression and neuromodulation procedure.

Reference


