PainWeek®

Failed Back Surgery Syndrome

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Disclosure

- Nothing to disclose

Learning Objectives

- Recognize FBSS
- Define the Etiology of FBSS
- Identify Diagnostic tools for FBSS
- Discuss the Management of FBSS

Introduction to FBSS

- Low back pain is a worldwide problem, with an estimated 9.4% global incidence, creating more disability than any other condition in the world
- Prevalence of low back pain increases with age
- Between 1998 and 2008, the annual number of hospital discharges for primary lumbar fusions increased by 170.9% from 77,682 to 210,407
- During the same period, the rate of laminectomies increased by 11.3% from 92,390 to 107,790
- Sometimes surgery fails to provide relief or provides only temporary relief of the patient's pain

Introduction to FBSS

- The International Association for the Study of Pain defines failed back surgery syndrome (FBSS) as:
  - Lumbar spinal pain of unknown origin either persisting despite surgical intervention or appearing after surgical intervention for spinal pain originally in the same topographical location
- The onset of FBSS occurs when surgery fails to treat the patient's lumbar spinal pain
- Minimizing the likelihood of FBSS is dependent on determining a clear etiology of the patient's pain
- After determining the cause of FBSS, a multidisciplinary approach is preferred.

Introduction to FBSS

- Patients with FBSS have had one or more surgical interventions that have failed to treat the pain
- FBSS incidence is between 20-40%
- A review of discectomies for lumbar disc herniation in patients under the age of 70 years demonstrated recurrent back or leg pain in up to 36% of patients
- FBSS was present in 29.2% of patients in a prospective study of patients who underwent a surgical laminectomy with or without fusion demonstrated
- Improved outcomes will rely more on comprehensive knowledge of the physician in order to effectively prevent, diagnose, and treat FBSS

Etiology of FBSS – Preoperative Factors

- Many preoperative indicators determine the likelihood of success of spinal surgery
  - Accuracy of diagnoses
  - Behavioral status
  - Medical status
  - Psychological factors
  - Socioeconomic factors

Etiology of FBSS – Accuracy of Diagnosis

- Inaccurate diagnosing is a major factor leading to FBSS, with as much as 58% of FBSS resulting from undiagnosed lateral stenosis of the lumbar spine
- Multiple studies have shown that back pain caused by foraminal stenosis is associated with greater rates of FBSS
- Entrapment of the superior cluneal nerve is an often overlooked diagnosis in patients presenting with lower back pain
- Diagnostic injections can be used to further clarify the sources of back and leg pain

Etiology of FBSS – Behavioral Factors

- Behavioral factors may act to affect postoperative outcome after spine surgery
- A large prospective cohort study involving 4,555 patients who had spine surgery for lumbar spinal stenosis demonstrated that smokers had a more regular use of analgesics, worsened walking ability, and inferior overall quality of life 2 years after surgery compared with nonsmokers
- Smoking is also associated with an increased rate of perioperative complications
- This emphasis can be applied to multiple facets of life including maintenance of body habitus and optimization of emotional disposition prior to surgery

Etiology of FBSS – Psychological Status

- Psychological evaluation to assess for risks factors may predict likelihood of success after surgery
- Multiple studies have demonstrated that depression is one of the strongest prognostic indicators of a negative outcome after spinal surgery
- Depressed patients generally feel more pain and weakness, possibly due to worsening of central sensitization due to surgery
- Return to work is at significantly lower rates in patients with depression
- Depression, anxiety, and other psychological and social factors may be used to assess whether the patient is a good candidate for spinal surgery
- As a result, the United States Preventative Service Task Force recommends a presurgical psychological screening
- Majority of spinal surgeons do not use such an evaluation

Etiology of FBSS – Socioeconomic Factors

- Economic influences that may act to prevent successful spinal surgical outcomes
- Patients involved in litigation and workers' compensation may create factors such as voluntary and involuntary secondary gain that may hinder the patient's motivation to improve
- Multiple studies have demonstrated that patients receiving workers' compensation respond poorly to spine surgeries compared with nonworkers' compensation in nearly all outcome variables including postoperative pain levels, postoperative opioid use, functional ability after surgery including ability to work, and overall emotional well-being

Etiology of FBSS – Postoperative Factors

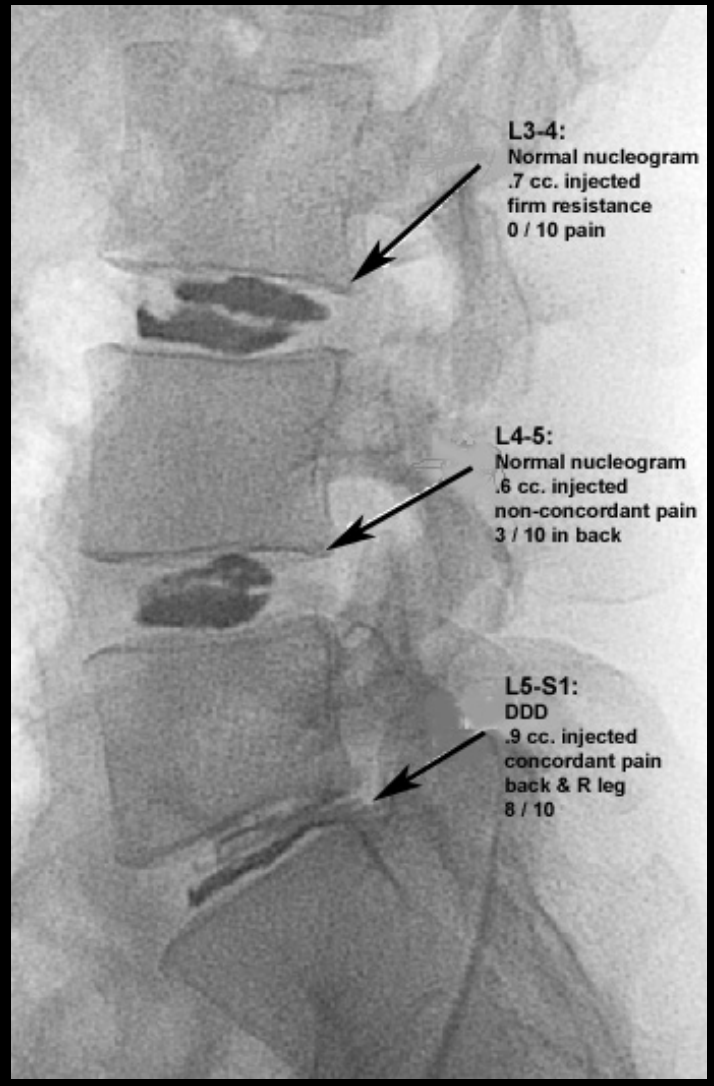
- The recurrence of back pain or the failure of back pain to resolve can be multifactorial in origin
- Diligent postoperative assessment and follow up are imperative
- Pain may result from further degeneration of the spinal column, new onset spinal pathology, or trauma/stress from surgery
- Back surgery often results in biomechanical changes and increased load burden within adjacent structures, which results in stiffness, inflammation, spasms, and fatigue
- This accelerates degeneration above and below the area of surgery
- Fusion of the lumbar spine may lead to sacroiliac joint disease
- Degenerative changes of the spine include facet arthropathy, new onset foraminal stenosis, disc degeneration, new onset herniated disc, and epidural adhesions

Diagnosis of FBSS

- Diagnosis always begins with a thorough history and physical examination
- This information, compared to the patient's presurgical information, can help elucidate a differential diagnosis
- Longstanding pain after surgery may not be as emergent as in the acute phase but is often more difficult to assess
- Physical examination findings may help create a differential diagnosis, but they are often not reliable in establishing a clear diagnosis
- The only clinical examination finding that correlates with facet arthropathy is paraspinal tenderness, which can be positive in even myofascial pain
- Discogenic pain may also present as either radicular or nonradicular pain
- Because of these limitations, rely on other diagnostic modalities as well

Diagnosis of FBSS - Imaging

- X-rays are a simple first step, including flexion and extension
  - Limitations of plain film X-rays include its inability to show the spine in three dimensions and inability to display soft tissue
- Gold standard is MRI
  - Gadolinium-enhanced T1-weighted MRI allows for differentiation between disc herniation from postsurgical fibrosis
- CT is helpful in visualizing osseous changes and dimensions of the canals
- CT myelography may be needed with hardware interferes with images
- Discography may be needed to assess discogenic pain



Management of FBSS

- Involves conservative management followed minimally invasive procedures, followed by surgical options
- Revision surgeries are not associated with improved pain scores and have a higher rate of comorbidities and mortality
- Careful consideration of the type of therapy
- Careful consideration of the risks and benefits

Management of FBSS – Conservative Options

- Physical therapy
- Medication management
- Psychotherapy
- Stress reduction
- Cognitive behavioral therapy
- Acupuncture
- Diet
- Exercise

Management of FBSS – Pharmacological

- Oral pharmacological treatment of FBSS is multimodal and controversial
- Treatments include
  - Antiepileptics
  - Non-steroidal anti-inflammatories (NSAIDS)
  - Oral steroids
  - Antidepressants
  - Muscle relaxants
  - Opioids

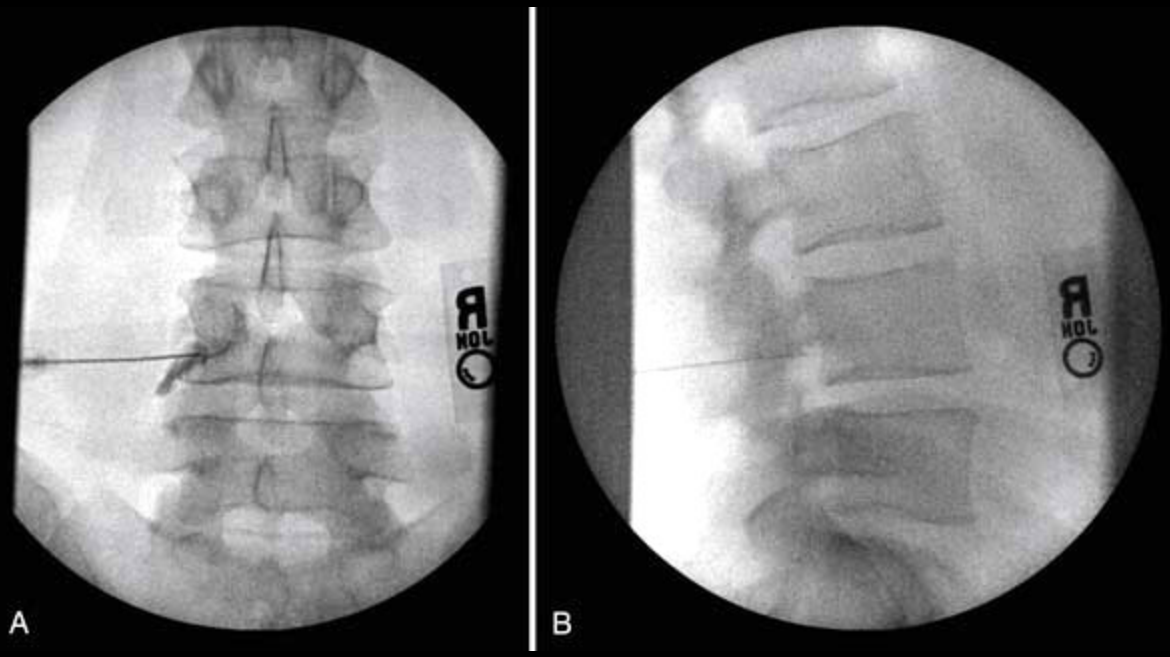
Diagnosis of FBSS – Diagnostic Procedures

- Diagnostic nerve blocks

- Nerve Blocks can be diagnostic and therapeutic
- Selective nerve root blocks
  - Mode of diagnosis
  - Can be more accurate than EMGs
- Sacroiliac joint injection
  - High rate of false negative
  - Medial and Lateral Branch block has a lower rate of false negative
- Facet joints
  - Intraarticular vs medial branch block (MBB)
  - Medial branch block (MBB) is a superior approach, less traumatic, and more predictive for Radiofrequency ablation (RFA)

Management of FBSS – Interventional

- Epidural injections
- Epidural steroid injections (ESIs) are the most commonly performed procedure in pain clinics around the world
- Administered via three approaches
  - Transforaminal (TFESI)
  - Interlaminar
  - Caudal



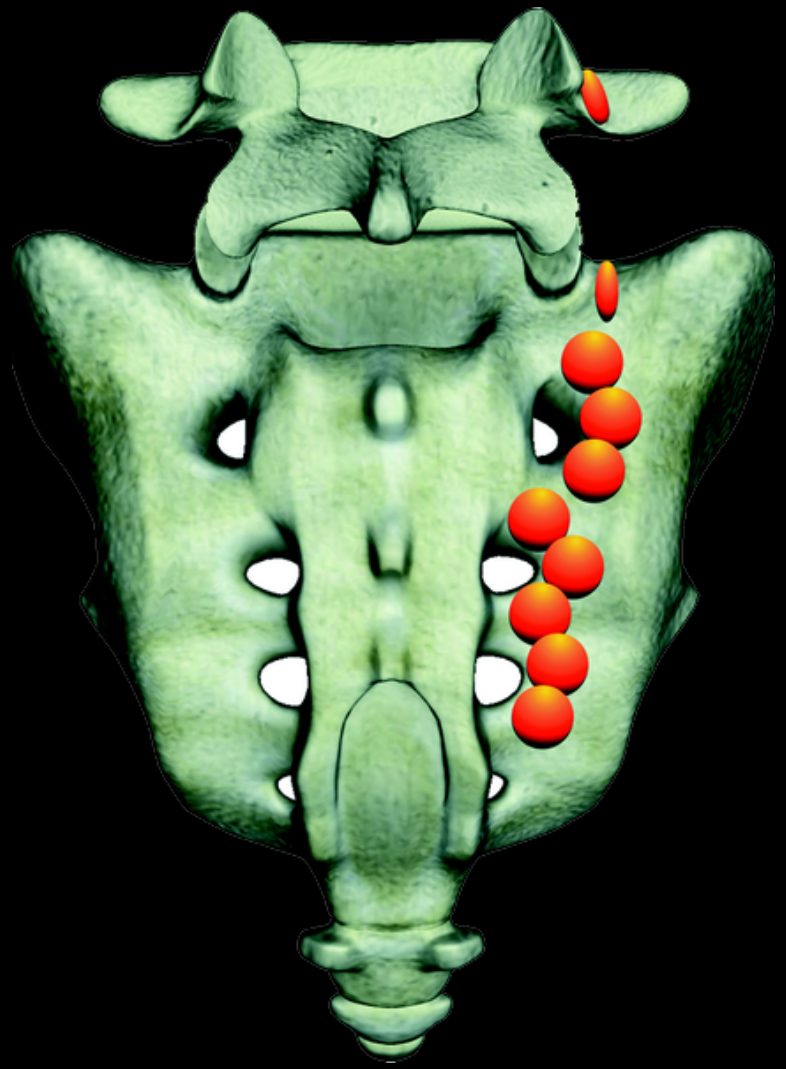
Management of FBSS – Interventional

Epidural injections

- ESI are indicated for radiculopathy (which can sometimes be incomplete)
- Radicular symptoms may be secondary to herniated disc, postoperative adhesions, ligamentum flavum hypertrophy, spondylolisthesis, and osteophyte formation
- Properly performed TFESI can be diagnostic and therapeutic
- Up to one-half of patients considering surgery for spinal pain can avoid it in the short term with ESI
- Evidence is even stronger in patients who have not had prior surgery
- In a separate study, up to 43% of patients had at least 50% pain relief after TFESI

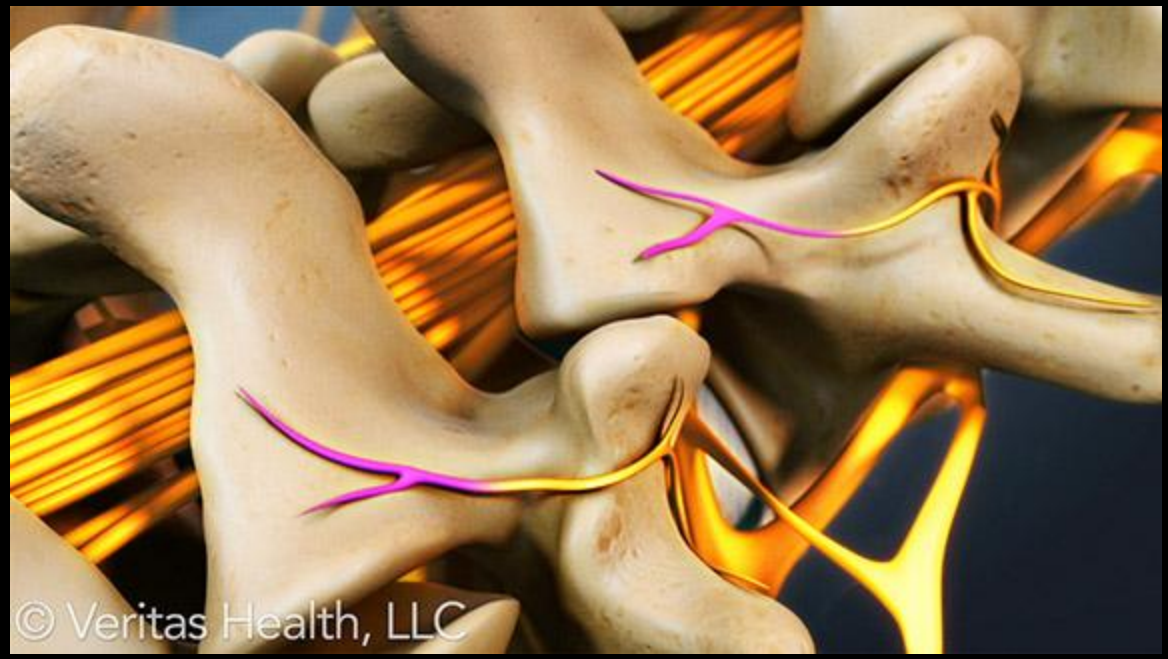
Diagnosis of FBSS – Interventional

- Sacroiliac joint injection
  - Intraarticular SI Joint injections have a high rate of false negatives
  - Medial and Lateral Branch block has a lower rate of false negatives and a higher rate of true positives
  - SI MBB and LBB are more predictive for Radiofrequency ablation (RFA)



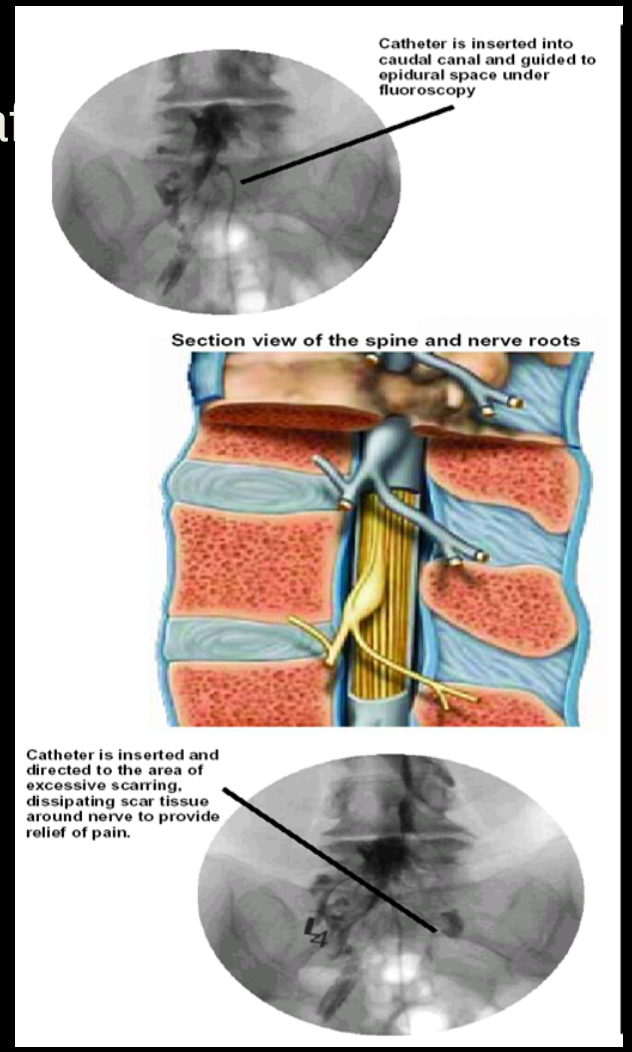
Diagnosis of FBSS – Diagnostic Procedures

- Facet joints
  - Intraarticular vs medial branch block (MBB)
  - Medial branch block (MBB) is a superior approach, less traumatic, and more predictive for Radiofrequency ablation (RFA)



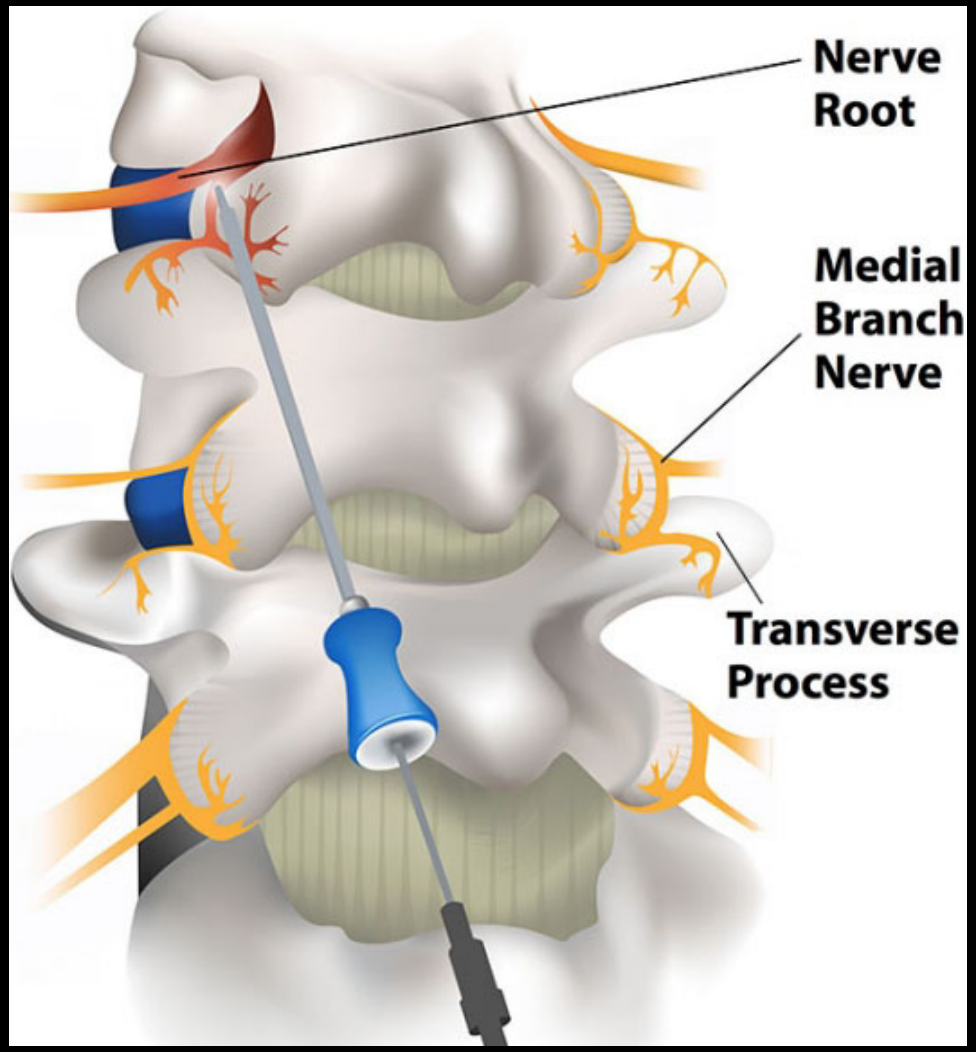
Management of FBSS – Interventional

- **Adhesiolysis**
  - Postoperative scar formation is a natural part of tissue healing a
  - Adhesions may cause back and leg pain
  - Adhesions may contribute to cause 20%–36% of FBSS cases
  - Adhesions compromise the efficacy of ESI
  - Adhesions can theoretically be lysed



Management of FBSS – Interventional

- Radiofrequency ablation (RFA)
  - RFA is used to provide longer term relief
  - Heat vs pulsed vs cooled



Management of FBSS – Interventional

- **Neuromodulation**
  - Spinal cord stimulation (SCS), Dorsal Column Stimulation (DCS), and Dorsal Root Ganglion Stimulation (DRG)
  - SCS has been around for about 50 years
  - SCS-induced analgesia occurs by its effects on the spinal cord, supraspinal components of the central nervous system, descending inhibitory pathways, and inhibiting pain facilitation
  - Studies state that SCS implantation would be cost-effective in 80%–85% of patients
  - SCS may improve loss of productivity, costs associated with disability, emergency room visits, imaging costs, and costs of medications and hospitalizations
  - Newer innovations include burst technology, higher frequency stimulation, dorsal root ganglion stimulation, and peripheral nerve field stimulation

Management of FBSS – Surgical

- Surgical revision for FBSS is associated with a high morbidity with corresponding low rates of success
- Arts et al demonstrated only a 35% success rate 15 months after an instrumented fusion for the treatment of FBSS
- These poor results demonstrate that the surgical option for the treatment of FBSS should be limited to last line therapy
- Loss of bowel or bladder function, motor weakness, progressive neurological impairments from spinal cord injury, severe incapacitating radiculopathy, pseudoarthrosis, instability, and surgical hardware malfunction necessitates surgery

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