Failed Lumbar Surgery Syndrome: The Imperative
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“Basic” Definition of FBSS

- Failed back surgery syndrome (FBSS), is defined as a back pain that persists or appears after a surgery of the spine in the same topographic location
- Failed back surgery syndrome (FBSS) is a condition in which there is failure to improve satisfactorily after back surgery
- Time lapse of maximum improvement post surgery
- Characterized by intractable pain and various degrees of functional disability after lumbar spine surgery
- Estimated to occur in 5% to 10% of patients after spinal surgeries

Failed (Low) Back Surgery Syndrome

- Major causes of FBSS are
  - fibrosis and adhesions
  - spinal instability
  - recurrent herniated disk
  - inadequate decompression

FBSS

- A clinical syndrome in which patients have persistent back and/or leg pain after one or more surgical procedures aimed at correcting lumbosacral disease
- FBSS may result from:
  - incorrect initial diagnosis
  - poor patient selection
  - incomplete decompression
• decompression at the wrong level
• recurrent disk herniation
• segmental spinal instability
• facet joint disease
• permanent nerve root damage
• epidural fibrosis
• arachnoiditis

• In some patients, despite adequate surgical decompression, low back and radicular pain are persistent

• The resultant “failed back surgery syndrome” is characterized by chronic debilitating pain with consequent psychological and social side effects

• The conundrum

  • While, failed back surgery (FBSS) is a nonspecific term that implies that the final outcome of surgery did not meet expectations

  • It is important to delineate the cause of FBSS, because treatment must be individualized according to the cause of the pain

  • Communication is key...

  • Expectations for outcome must vary according to the type of structural problem

  • The physician/surgeon must convey realistic expectations to the patient

**VAS**

• For chronic pain, an improvement in visual analog scale (VAS) score of 1.8 units, equivalent to a change in pain of about 30%, is a somewhat satisfactory result

• An improvement in VAS of 3 or more, equivalent to a change in pain of 50%, is an extremely satisfactory result

**FLBSS Stats and options- 6-7-5**
• Approximately 80,000 patients a year continue to have chronic, disabling back pain after one or more spinal surgeries

• 6 anatomical abnormalities of the spine most commonly result in back surgery

• 7 undesirable outcomes lead to failed back surgery syndrome

• Prevention requires determination of the specific anatomical abnormality responsible for ongoing symptoms, an abnormality that may or may not be related to the initial abnormality for which surgery was performed

• One or more of 5 nonsurgical treatment options* may be useful to prevent the need for further surgery, as each subsequent surgery has a lower likelihood of success
  
  • Non-Surgical Treatment Options
  1) Oral Pain Medications
  2) Physical Medicine (manipulation and physical therapy)

After 6 months of physical medicine
  
  3) Spinal Cord Stimulation
  4) Radiofrequency Neurolysis
  5) Rehabilitation

The rising tide...

• Back surgeries performed to relieve low back pain in the United States rose from 300,413 in 1994 to 392,948 in 2000

• Lumbar fusion surgery increased 220% from 1990 to 2001
  o Best estimates suggest that although 60% or more of initial back surgeries have a successful outcome, many are not successful
• In a retrospective study of 24,882 patients who underwent spinal surgery in Washington State from 1990-1993, 19% required reoperation for pain or complications of surgery over the ensuing 11 years
  
  o Success rates fall to around 30% after a second back surgery, 15% after the third, and to 5% after the fourth surgery

AXIOMS of the PROBLEM

• Internists (non-physical medicine specialists) are generally unfamiliar with the conditions for which back surgery is performed or how to deal with patients with failed back surgery......too harsh, perhaps?

• Best estimates suggest that approximately 40% of back surgeries for low back pain are unsuccessful, and these patients often gravitate to internists.........still too harsh?

• Ninety-five percent of the students failed to show basic musculoskeletal competency. A change in medical curriculum and teaching methods is required to address this problem.

• When the minimum passing level as determined by orthopedic program directors was applied to the results of these examinations, 70.4% of graduating COM students (n=54) and 82% of allopathic graduates (n=85) failed to demonstrate basic competency in musculoskeletal medicine.

• Understanding the 6 spinal abnormalities most commonly associated with failed back surgery syndrome is required for adequate clinical management

“The 6”

• Spinal surgery is optimally performed only when the pain and symptoms correlate with a corresponding anatomic abnormality to yield the best outcomes
  
  • Disc herniation
  
  • Spinal stenosis
- Degenerative disc
- Spondylolisthesis
- Degenerative scoliosis
- Spinal instability

Lumbar Anatomical Abnormalities Precipitating Surgery (Initial or Revision)

- Abnormality          Surgical Procedure
- Disc herniation     Discectomy, laminotomy, laminectomy, foraminotomy
- Spinal stenosis      Decompression, laminectomy, foraminotomy
- Degenerative disc    Fusion with instrumentation
- Spondylolisthesis    Decompression and fusion with instrumentation
- Degenerative scoliosis Decompression and fusion with instrumentation
- Spinal instability   Fusion with instrumentation

Modified Macnab Criteria for Post Lumbar Surgery Residuals

Excellent  Free of pain
            No restriction of mobility
            Able to return to **normal work & activities**

Good       Occasional nonradicular pain
            Relief of presenting symptoms
            Able to return to **modified work**

Fair       Some improved functional capacity
            Still handicapped and/or unemployed
Poor Continued objective symptoms of root involvement Additional operative intervention needed at the index level, irrespective of repeat or length of postoperative follow-up

**Hazard Criteria of Recurrent Back Surgery Symptoms**

- **Immediately after surgery**, failure to achieve relief of symptoms or a continuation of preoperative symptoms has been attributed to an initial wrong diagnosis, technical error, or poor patient selection because of psychosocial factors.

- **Temporary relief** after surgery followed by pain recurrence within a few weeks of surgery suggests infection.

- When pain occurs **months after surgery**, re herniation, battered root syndrome (inflammation of the nerve root as a result of surgical manipulation), epidural fibrosis, or arachnoiditis are suspected.

- Failures after several years may be caused by loss of spinal instability or spinal stenosis, either at the previous surgical site or at an adjacent level.

**Most Common Causes of Failed Back Surgery**

With current imaging and diagnostic injections, structural cause of FBSS can be elucidated in over 90% of patients:

- **Foraminal stenosis** 25%-29%
- **Symptomatic degenerative disc disease** 20%-22%
- **Pseudoarthrosis (failure of fusion)** 14%
- **Neuropathic pain** 10%
- **Recurrent disc herniation** 7%-12%
- **Iatrogenic instability** 5%
- **Facet joint pain** 3%
- **Sacroiliac joint pain** 2%
Alarm Signs in Patients with Previous Back Surgery

• **Uncontrolled pain** with analgesics
• **Waking up at night** due to pain
• **Weakness**, shooting pain, and paresthesias in the lower extremities
• **Constitutional symptoms** such as fever, vomiting or unplanned weight loss
• **Loss of bowel or bladder control** often associated with numbness in the perianal and groin areas*

Psychological Factors Influencing Initial and Revision Lumbar Surgery

• Psychological factors in failed back surgery
• Pain is more than sensation, and the outcome of spine surgery is more than correction of abnormal anatomy
• Psychological factors are involved in pain and behavior and are going to play a role in surgical outcome
• Most patients with refractory LBP have symptoms of at least one major psychiatric disorder, most commonly depression, substance abuse disorder or anxiety disorder
• Pure psychogenic pain (pain disorder, psychological type) is rare in patients with FBSS
• All patients have some pain behavior, which may be appropriate or inappropriate

Surgical Predictors and Correlates for Chronic Post Surgical Pain (CPSP)

• Anxiety
• Depression
• Female gender
• Full-time employment
• Health status and well-being
• Higher pain relief expectations
• Hospital where surgery performed
• Household size
• Income
• Late or failed return to work
• Litigation/compensation
• Low education
• Low mental health care
• Marital status
• Neuroticism
• Patient’s decision-making
• Psychological aspects of work
• Psychological vulnerability
• Race
• Return to work at home/social activity
• Self-control
• Self-perception of recovery
• Sense of control over health
• Social support
• Stress
• Surgeon (Consultant) performing (i.e. experience)
• Type of Surgery
• Vitality
• Younger age
• Depression

• The most severe cases of CPSP after one year appeared in those patients with the most severe levels of pre-operative depression
• Patients with CPSP use more psychotropic drugs (e.g. antidepressants) before surgery than patients without CPSP
• Pain relief after lumbar discectomy is associated with decreased pre-operative depression levels

**Late or Failed Return to Work/Activities of Daily Living**

• Chronic pain is the major reason for not returning to work.
• Chronic Post-Surgical Pain
• Chronic post-surgical pain (CPSP) is a common phenomenon and has been the focus of increased international research since the beginning of the 1990s
• With incidence ranging from 10% to 50%, it is a prevalent complication after surgery
• Chronic pain both impacts patients’ quality of life and increases the costs of healthcare
• Chronic pain is often defined as pain lasting for at least 3–6 months
• CPSP is pain that develops after surgery and persists for at least two months
• Other causes and pre-existing problems must also be excluded
• The development of chronic pain is influenced by physical, psychological and social factors
• In the case of spine surgery, psychological factors have an even greater impact on outcome than medical ones
• Chronically stressed patients are at higher risk for poor surgical outcomes
• Psychological Vulnerability
  • …a reaction readiness defined by a low threshold for being influenced and a risk of in-expedient reactions in social interaction and health-related behavior…
  • …a strong correlation between pre-operative psychological vulnerability and persistent pain
• Stress
  • A normal score on the Distress and Risk Assessment Method (DRAM) is an important predictor for a positive outcome
  • Patients with failed back surgery have higher pre-operative stress levels and blunted HPA axis reactivity
Chronically stressed patients show alterations in their physiological stress-reactions and are therefore at higher risk for developing persistent pain

- Type of Surgery

**Pre-FBSS Surgery Types**

(General)

- In general terms,
  1. Surgeries for leg pain (Discectomy, laminotomy, laminectomy, foraminotomy)
  2. Surgeries for LBP (Decompression and fusion with/without instrumentation)

- If the surgery was appropriate...
  1. Technical success
     1. residual foraminal stenosis
     2. residual herniated nucleus pulposus [HNP])
  2. Technical failure
     1. Pseudoarthrosis
     2. Complications
        1. infection, instability, misplaced instrumentation, neuropathic pain

- Loss of stability can result from excessive bone removal during decompression surgery
- Resection of 50% or more of the facet joint affects the stability of the spine
- Spinal instability also can occur at an adjacent level after fusion surgery, due to increased motion as the adjacent segments compensating for the loss of motion at the fused segment
- Spinal instability increases from 12% after one operation, to 50% after 4 or more revision surgeries
• Risk factors for reoperation are spinal fusion with the surgery, age <60 years, and workers’ compensation claims

**Myofascial Pain Syndromes in Failed Back Surgery Syndrome...the perfect storm**

• Myofascial pain syndromes are poorly understood chronic pain syndromes

• Diagnostic criteria for fibromyalgia are based on the presence of tender points at specific locations, including those in the back

• The prevalence of these syndromes in failed back surgery syndrome is unclear

• If present, symptoms seem best approached by evaluation and treatment of sleep disorders, warm-water-based exercise programs, and antidepressants

• Other factors that can contribute to musculoskeletal back pain include poor posture, pes planus, leg length differences, reduced strength of the muscles in the lower torso, lack of oxygen in the back tissues caused by smoking, and psychosocial factors