Failed back spine surgery
Presentation

- Definition
- Etiology
- Prevalence
- Evaluation
- Treatment
- Case study
FBSS: Definition

- A constellation of conditions that describes persistent or recurring low back pain, with or without sciatica following one or more spine surgeries
  - North et al, Neurosurgery, 1991
FBSS: Definition

- The outcome of lumbar spinal surgery does not meet the pre-surgical expectations of the patient and the surgeon.
  - Waguespack et al, Pain Medicine 2002
Epidemiology

• Low back pain
  – Life time prevalence is 60-85%

• Incidence of surgery
  – 1997: 317,000 surgeries
  – 2002: > 1 million spinal procedures
Epidemiology

• Complex surgery (decompression plus)
  – 20002-2007 15 fold increase
  – 1.3/100,000 to 19.9/100,000 surgeries
  – Complication rate 2.3% for simple surgery compared to 5.6% for complex surgery
Surgical success rate

- Nachemson
  - Index surgery 50%, second surgery 30%, third surgery 15% and fourth surgery 5%
- Decompressive surgery success rate 75-80%
Etiology: Preoperative factors

– Psychological factors
  • Depression, anxiety, poor coping, somatization, hypochondriasis
  • Personal injury; worker’s compensation

– Surgical
  • Repeat surgery results in increased instability
  • Poor selection (surgery for axial pain)
  • Wrong level or levels of surgery
  • Wrong surgery
Etiology: Intraoperative factors

• Inadequate or overaggressive surgery
• Wrong level (2.1-2.7%)?
• Inability to achieve surgery
  – Unable to access far lateral disc, etc.
Etiology: Postoperative factors

- Progressive disease
  - Recurrent disc herniation (up to 15%)
  - Progressive changes at adjacent sites following decompression or fusion
  - Post-operative bleeding
- Epidural fibrosis in 20-36% of patients
- New instability/altered biomechanics
Etiology: Postoperative factors

- Surgical complications
  - Disc space infection
  - Hematoma
  - Dural tear/pseudomeningocoele
  - Nerve root damage
    - Nerve retraction, direct damage, arachnoiditis, etc
- Myofascial pain
  - Altered biomechanics, muscular atrophy, weakness
Prevention of FBSS

• Careful discussion about the proposed surgery
  – Set appropriate goals and expectations with the patient
• Optimal decision
• Optimal timing
• Evaluate poor prognosticating factors and risk benefit ratio
Treatment

- Establish differential diagnosis
  - address red flag issues such as infection, fractures, missed diagnosis
  - Decide on further work up
- Evaluate pain and functional levels
- Create short term goals
- Create long term goals: INCLUDE PATIENT in all planning
Treatment options

- Life style
- Medication
- Therapeutic
- Interventional
- Surgery
Evaluate and treat function!

- It is great to be a physiatrist
- You may not always help pain, but you can always address function and suffering
Life style

- Weight loss
- Smoking cessation
- Substance abuse
Therapeutic options

• Physical therapy
• Occupational therapy
• Cognitive strategies
• Biofeedback and relaxation treatment
• Acupuncture
• Manipulation
Exercise

- Cady, L, Program for increasing health and physical fitness of Fire Fighters; Journal of Occupational Medicine, 1985
  - Higher level of physical work capacity, strength and flexibility were inversely related to workers’ compensation costs.
Multidisciplinary rehabilitation

• Intensive multidisciplinary (100 hrs) biopsychosocial rehabilitation with functional restoration produces improvement in pain and function for chronic low back pain

• Contradictory evidence regarding vocational outcomes of intensive multidisciplinary psychosocial rehabilitation

Multidisciplinary rehabilitation

• Subacute low back pain improves with multidisciplinary rehabilitation
  • Karjalainen, KA 2003 Cochrane review

• Mindfulness-based stress reduction may be a useful clinical intervention for patients with FBSS
  • Emer et al, JAOA, 2010
American College of Physicians and American Pain Society

• Joint Clinical Guideline on low back pain, 2007
• Subacute low back pain
  – Intensive interdisciplinary rehabilitation is moderately effective (includes psychological, physical therapy, social or vocational intervention)
  – Functional restoration with a cognitive–behavioral component reduces work absenteeism due to low back pain in occupational settings
American College of Physicians and American Pain Society

• Joint Clinical Guideline on low back pain, 2007
• Chronic low back pain
  – Moderate effective therapies:
    • Exercise that includes individual tailoring, supervision, stretching and strengthening are associated with the best outcomes
    • Massage, yoga, cognitive-behavioral therapy, progressive rehabilitation, spinal manipulation and intensive interdisciplinary rehab
Medication

- Acetaminophen
- NSAIDS
- Muscle relaxants
- Opioids
- Antidepressants
- Membrane stabilizers
- Topical agents
Medication

• Evaluate short term issues
  – Pain
  – Sleep
  – Address efficacy of current agents
  – Look for cognitive, bowel and bladder side effects

• Set long term goals

• Small steps with polypharmacy
Injections and minimally invasive tx

- Injections
- Spinal stimulator
- Intrathecal analgesia
- Epidural adhesions
Spinal injections

- Epidural steroid
- Z joint: facet injections, medial branch ablations
- Sacroiliac injections
Spinal cord stimulator

- North et al, 1991
- 50 patients with FBSS
- >50% relief in 53% of patients at 2.2 years
- >50% relief in 47% of patients at 5 years
- Patients had lumbar arachnoid and epidural fibrosis
- Compared favorably to other series where patients had repeat surgery or underwent dorsal root ganglionectomy
Spinal Cord stimulator

- North et al, 1991
- Better for radicular pain than axial pain
- Psychological screening critical
Spinal Cord stimulator in FBSS

• Efficacy questioned
  – Taylor et al, systemic review, 2004
  – Turner et al, systemic review, 2004
  – short duration follow-up, poor quality, multicenter, variable indications
  – Effect decreases over time
  – High incidence of adverse reactions
Spinal cord stimulation

- North et al, 2005
  - SCS vs repeat lumbar surgery
  - SCS vs opioid management
  - Mean f/u at 2.9 years
  - Strong evidence for analgesic and functional benefit in predominant radicular pain with SCS
• Kumar et al, 2007
  – SCS vs conventional medical management
  – Significantly greater pain relief in SCS (48% vs 18%) at 12 months
  – SCS improved quality of life and functional capacity (p< 0.05)
  – At 6 months 32% of patients had device related complications
Spinal cord stimulator

• Manca et al, 2008 Eur J Pain
  – Greater health care costs for SCS vs medical management at 6 months

• North et al, 2007, Neurosurgery
  – SCS vs reoperation
  • Costs significantly in favor of SCS in the long term
Spinal cord stimulation

• Cost effective compared to conventional medical management in patients with CRPS, FBSS, Peripheral arterial disease, and Refractory Angina Pectoris in Canadian study
• Probability of SCS being cost effective is 75-95% depending on pathology
• Calculated over 20 year horizon
• Kumar, 2013, Pain Medicine
SCS: Conclusion

• Need screening trial
• Effective for extremity pain
• Need appropriate expectations
  – May still need medication and therapy
  – Duration of efficacy?
  – Future MRI?
• May be cost effective
• Complications and further maintenance must be consideration
Intrathecal Analgesia for FBSS

• Raphael, JH, BMC Musculoskeletal Disorders, 2002
  – 36 patients: retrospective, 24 with FBSS, 12 with chronic low back pain
  – Medication included diamorphine, bupivacaine, clonidine, baclofen
  – Range of .5-9 years (average 4.38 years)
Intrathecal Analgesia for FBSS

• Raphael, et al
  – Significantly improved quality of life measures and pain
    • Work interruption and effect of pain on sex did not improve
  – Chronic back pain improved
    • Trend toward improvement in quality of life measures, but no significant improvement
Intrathecal Analgesia

• Long term evidence is uncertain
• Potential complications
  – Urinary retention, constipation, nausea, pruritis, equipment malfunction, catheter granuloma
  – Tolerance
Percutaneous epidural adhesiolysis

• Goal
  – Decrease epidural fibrotic tissue
  – Improve delivery of epidural drugs
• Epter et al, 2009, Pain Physician
  – Systematic review of percutaneous adhesiolysis
  – FBSS
  – 3 RCT, 4 observational studies met methodological quality
Percutaneous Adhesiolysis

- Epter et al
  - Adhesiolysis with or without hypertonic saline neurolysis provides effective tx for FBSS
  - Best reserved for patients with FBSS who have failed other treatment for radicular symptoms including epidurals
Adhesiolysis: Complications

- Well tolerated
- Local pain
- Potential complications
  - Nerve root irritation/damage
  - Blindness secondary to high epidural hydrostatic pressure causes excessive subarachnoid pressure with retinal perfusion or macular bleed
  - Dural tear, infection
Fusion for FBSS

- Arts et al, 2012; Acta Neurochir
  - 82 patients with instrumented fusion for FBSS
  - At 15 months 35% of patients had good outcome and 65% had unsatisfactory outcome
Case Discussion

- 79 year old female with remote L4-5 fusion
- Chronic cervical and lumbar pain
- Exacerbated back on 6/23 after fall
- Back pain radiates into left anterolateral thigh to knee
- Paresthesias in left knee and anterior thigh
- Failed L45 interlaminar injection and PT
- Left tibialis anterior and extensor hallucis longus 4/5, limited lumbar flexibility
Case 1: Preoperative x-rays
Case 1: Preoperative MRI
Case Presentation

- 2/14 seen by PM&R
- 2 months post L2-4 post anterior and posterior fusion
- Pain persists in same distribution
- Back 8/10, left anterior thigh is 4/10
- PMH: anxiety and insomnia
- Meds: Klonopin HS
- Lives alone, independent with ambulation/ADLS
- 4/5 left hip flexors, limited hip rotation
Postoperative MRI
Postoperative x-rays
Impression

- S/P L2-L4 fusion, anterior and posterior
- Lumbar disc degeneration and leg pain
- R/o hip djd
- Depression
- Anxiety
- Sleep disorder
What do you want to do?

- Work up
- Lifestyle
- Medication
- Therapy
- Injections
- Surgery
Treatment

- Physical therapy
- Psychotherapy
- Sleep center
- Tens
- Voltaren Gel
- Failed neurontin, lyrica, trazodone, pamelor
- Wants to get off of klonopin
Pain persists

- Hip, pelvis MRI negative
- No infection
- Remains depressed anxious and angry at surgeon
- High pain levels
- Remains functional
How do you wish to proceed?

• Spinal cord stimulator?
• Meds?
• Therapy?
• Supportive care?
Where did we go wrong?

• Preoperative factors
  – Depression, anxiety, sleep disorder
  – Personal injury issues?
  – Adequate discussion?
  – Proper surgical candidate?

• Surgical factors
  – A lot of surgery, too much?
Never argue about the patient’s perceived pain!!!!!!!
Conclusions: Preoperative

• An ounce of prevention......
  – Set realistic expectations with the patient
  – Operate on leg pain with compressive etiology
  – Make sure that the treatment is not worse than the cure
  – Identify potential contributing problems
Conclusions: Perioperative

- Infection
- Bleed
- Recurrent disc herniation
- Nerve root injuries
Conclusions: Postoperative

• Address red flags
  – Malignancies, fractures, visceral lesions
• Make sure that the diagnosis is correct
  – Hip or knee pathology, diabetic neuropathy, plexopathy, vascular insufficiency
• Treat the pain that you can treat; address function and suffering
• Establish a treatment plan in combination with the patient
Questions?