1 Operative Management of Common Spinal Conditions
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2 Overview
   What was I thinking?
   • Herniated Disc
   • Stenosis
   • Spondylolisthesis
   • Low Back Pain
   • Neck Pain
   • Compression Fractures
   • Sacroiliac Joint Dysfunction

3 Keep it Simple
   • Essentially 2 operations we can do
     • Or in combination
     • Decompress nerves
     • Fuse bones together
     • Decompress and fuse

4 If its so simple why does spine surgery have such a bad wrap?
   • Poor patient selection
   • Wrong operation
   • Patient expectations

5 However, there are home run operations!
   • Herniated discs
   • Stenosis
   • Spondylolisthesis
   • Insufficiency Compression fxs
6 Herniated Discs
   • Natural history
     • Most get better within 6 weeks
       • Outcome similar at 10 years with or without surgery
   • Indications for surgery
     • Incapacitating pain after 6-12 weeks conservative care
     • Progressive weakness
     • Cauda equina
     • Myelopathy

7 Herniated Discs
   • Cervical Spine
     • Radicular arm pain, weakness
   • Anterior Cervical Discectomy and Fusion
   • Posterior laminoforaminotomy
   • Arthroplasty

8 Herniated Disc Cervical

9 Cervical Arthroplasty
   • Maintains motion
   • Decreased stress on adjacent segments
   • 10 year outcomes same as fusion
   • No risk for pseudarthrosis

10 Cervical Arthroplasty

11 Herniated Discs
   • Lumbar spine
     • Leg pain, buttock pain, weakness,
     • Back pain
     • Cauda equina syndrome
       • EMERGENT
   • 60-80% improve with conservative care
   • Microdiscectomy
- 95% favourable outcomes
- Failed revision = fusion

12 □ Cauda Equina Syndrome

13 □ Cauda Equina Syndrome

14 □ Stenosis
- Narrowing of the spinal canal
- disc collapse and bulging
- disc osteophytes
- redundancy and infolding of ligaments

15 □ Zone of Stenosis

16 □ Cervical Stenosis
- Causes cord impingement
  - Myelopathy
  - Nerve root impingement
  - Early myelopathy is hard to recognize
    - Vague pain
    - Hyper reflexive
    - Gait disturbance
    - Bowel and bladder disturbance
    - weakness
    - lose fine motor skills - loss of dexterity

17 □ Cervical Myelopathy
- poor prognostic factor is hyper intensity of cord on T2 and hypo intense on T1

18 □ Lumbar Stenosis
- Nerve root impingement
  - leg pain
    - foraminal worse with sitting
    - numbness/tingling
• Neurogenic claudication
  • Walking intolerance
  • Shopping cart sign
  • Pain with standing
    • Classically radiates around from buttocks to lower legs
  • Hallmark- gets better with sitting
    • Vascular claudication will get better at rest without sitting
  • Pseudoclaudication

19 Stenosis Operative Management
  • Decompression
    • Laminectomy with/without fusion
    • Corpectomy
    • Discectomy and fusion
  • Uniformly good results for relief of claudicant pain
  • Myelopathy has varied results depending on severity of cord damage
    • Goal is to prevent worsening
    • Most see improvement on symptoms

20 Posterior Cervical Fusion and Decompression

21 Corpectomy

22 Discectomy and Fusion

23 Spondylolisthesis
  • Slippage of one vertebra on another
  • 2 main etiologies
    • Degenerative
    • Lytic

24 Degenerative

25 Lytic

26 Spondylolisthesis
  • Leg pain with or without back pain
• Instability
• Decompress and fuse
• Best operation we do in the lumbar spine
• Overall good results and high patient satisfaction

27 Spondylolisthesis
• restore stability
• restore alignment
• decompression

28 Low Back Pain
Operative Management?
• Very controversial
• Success Rates of 65% to 75%
• Eliminate motion by fusing to stop pain
• Preserve motion with artificial disc
• Patient selection is of utmost importance
• Do we fully understand back pain?
• Adjacent segment degeneration

29 Black Disc Disease
30 Fusion Prognostic Test
• abnormal nucleogram
• normal control level
• reproduce pain
  • concordancy

31 Back Pain Operative Management
• 6 months to a year of symptoms
• Treatment based on cause of symptoms
  • Disc, facets, deformity, instability
  • Complex
• Fuse motion segments
  • Procedure tailored to disease and patient
Anterior, posterior, minimally invasive
- Adjacent segment degeneration
- Artificial disc
  - Very select patients, no facet arthritis
  - Typically younger patients with limited disease

32 **Anterior Lumbar Fusion**
- Vessel injury
- Retrograde ejaculation
- Bowel injury
- Ureter injury
- Sympathetic injury

33 **Posterior Lumbar Fusion**
- Dural tear
- Nerve injury

34 **Xtreme Lateral Interbody Fusion**
- Numbness in thigh
- Pseudoherniation
- Transient hip flexion weakness

35 **Neck Pain Operative Management**
- Controversial
  - Better outcomes than low back pain
- Best results when there is limited disease
  - 1 to 3 level degenerative discs
  - Referred pain from discs
  - Worsening pain with flexion

36 **Neck Pain**
- Generally ACDF to remove pain generator
- Rarely PCF > 3 levels
- Risk of nonfusion increases with each additional level added
- Not recommended in smokers
Arthroplasty recommended for 1 and 2 level disease without facet arthrosis

37  Cervical DDD
38  Cervical DDD
39  Cervical DDD
40  Compression Fractures

• High incidence in elderly population
• Can be debilitating and lead to the spiral to the end of life
  • 54% mortality rate at 3 yrs
• Kyphoplasty uses balloon and bone cement to stabilize the fracture and stop pain
  • May decrease kyphotic deformity
  • Extremely high patient satisfaction
  • Immediate pain relief and return to function
• Vertebroplasty
  • no use of balloon
  • risk of cement extravasation

41  Compression Fractures
• MRI - hypointense on TI, hyperintense on T2
  • “freshness” typically lasts for 3 mths

42  Compression Fractures
• isotense on T2
• Kyphoplasty will not help

43  Compression Fractures

44  Complications
• cement embolization - vertebroplasty
• extravasation into spinal canal
  • make sure no defect in posterior cortex
  • exothermic reaction - damage nerves

45  Sacroiliac Joint Dysfunction
• Unrecognized and undertreated cause of low back pain
  • 18%-25% of low back pain caused by SI joint
  • Felt to be leading cause of LBP until 1934
    • 1934 first paper published on lumbar disc as a cause of back pain
    • Faded into the collective conscious of medicine
  • Arises from SI sulcus, can radiate down leg
  • Tricky to examine and diagnose
  • Often misdiagnosed and mistreated
  • Injection confirms diagnosis

46 [Si jt Pain]
  • SI jt sulcus tenderness
  • Positive FABER test

47 [Si jt Pain]
  • confirmation by injection

48 [Sacroiliac Joint Dysfunction]
  • Causes
    • OA
    • Trauma
    • Adjacent segment degeneration
      • Below a lumbar fusion
  • Recent interest in the SI joint as a source of pain has led to new treatments

49 [SI joint OA]

50 [SI Joint Dysfunction]
  Operative Management
  • Open fusion
    • Large operation with significant recovery
  • Minimally invasive fusion
    • Percutaneous fusion using dowels across the joint
      • High success rate
      • Excellent patient satisfaction