Minimally Invasive Sacroiliac Joint Fusion

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Disclosures

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Sacroiliac Joint

- Pair of large joints connecting sacrum to pelvis
- Surrounded by strong ligaments and muscles
- Very stable with very limited range of motion
Sacroiliac Joint Pain

• Causes of pain
  – Trauma
  – Tumor
  – Infection
  – Degenerative arthritis
  – Inflammatory arthritis
  – Postpartum instability
  – Adjacent segment degeneration after lumbar fusion
  – Injury after aggressive posterior iliac crest bone graft harvesting.
Sacroiliac Joint Pain

- Degenerative sacroiliac joint pain is thought to be responsible for 10-26% of chronic low back pain\(^1,2\)
- It is frequently misdiagnosed or under-diagnosed.
Sacroiliac Joint Pain

• Diagnostic workup
  – Rule out instability, tumor, infection
    • Xray, MRI, Bone scan
  – In degenerative conditions imaging can be normal but often see sclerotic bone changes and osteophyte formation
Sacroiliac Joint Pain

• Rule out other common sources of pain that can mimic sacroiliac joint pain
  – Lumbar stenosis/spondylosis/spondylolisthesis/DDD
  – Hip joint arthritis
  – Muscle strain
  – Trochanteric bursitis
Sacroiliac Joint Pain

• Physical Exam
  – Pain on weightbearing – antalgic limp
  – Pain while sitting on affected side
  – Tenderness to palpation
  – Pain reproduced on compression test (FABER) – 20% false positive test
Treatment

- Physical therapy
  - Main treatment, very effective
  - Stabilizes the joint by strengthening the muscles around it
  - Manipulation can “relocate” if subluxation occurred
Treatment

• Injections
  – Can be therapeutic and diagnostic
  – Must be done under fluoroscopic guidance
    • 50% miss rate if no imaging used
• Radiofrequency ablation
  – Somewhat controversial, Success rate 70%
Treatment

- Surgery is considered ONLY after failure of all non-operative options.
- The goal is to eliminate motion through the joint.
- Was initially performed through an open posterior approach.
Treatment

- Smith-Peterson approach
  - Initially described in 1925
  - Significant muscle dissection required
  - Lengthy recovery
  - Shown to be effective in eliminating SIJ pain
Treatment

• Recent advances in imaging and instrumentation allow for this procedure to be performed via minimally invasive, percutaneous lateral approach.
• Lateral approach is safe – no nerves or blood vessels in the way. No need for extensive dissection or neuro-monitoring.
• Proper fluoroscopic guidance is critical.
MIS SIJ fusion

- Pre-incision xrays localize entry point for the screws
MIS SIJ fusion

- Dissect soft tissue bluntly down to bone
- Under fluoroscopic guidance or computer navigation, a guidewire is inserted across the SI joint to establish screw trajectory.
- Path for the screw is created by drilling over the guidewire
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• Screws are sequentially inserted using fluoroscopic guidance
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• Local bone autograft from bony reamings is used to achieve bony fusion while screws are stabilizing the joint.
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MIS SIJ fusion

• Animation: http://www.globusmedical.com/portfolio/si-lok/
MIS SIJ Fusion

- Surgery can be outpatient, but overnight stay may be needed for pain control and physical therapy (for crutches training)
- If done at ACS, should have overnight stay capability
- Usually no drains required
- Toe-touch weight bearing on the operative side for 2 weeks to allow for soft tissue healing.
MIS SIJ fusion

- Very favorable early to mid-term results\textsuperscript{4,5}
- Long-term outcome studies pending
- One prospective multicenter cohort study now has 2-year results\textsuperscript{7}:
  - 172 patients at 26 sites
  - Triangular titanium implants used
  - Pain and ODI scores decreased from 79.8 to 26.0 and 55.2 to 30.9 points respectively
  - 97% fusion rate at 1 year per CT scan
  - 8 (4.7%) needed revision surgeries.
MIS SIJ Fusion

- Private insurance coverage very poor at this time for degenerative conditions
- Covered by Medicare as of 4/1/2016
- Economically more effective than non-operative treatment for chronic SIJ pain$^6$
ASC Considerations

• Implant costs are significant – need to work out a package with the payor or as a self-pay bundle

• Experienced RT is needed to handle intraoperative fluoroscopy (need to quickly change between inlet, outlet, and lateral views)

• Jackson table or a radiolucent table with Wilson frame is needed for prone positioning.
Case Example

- 59 y.o. male presents with 1.5 yr. history of low back and right buttock pain
- Anti-inflammatory medications, full course of physical therapy, trigger point injections, and osteopathic manipulations did not resolve the pain
- Sacroiliac joint injections under fluoroscopic guidance provided 100% relief of the pain for several weeks
Case Example

• Physical exam:
  – Antalgic gait to right side
  – Tenderness to palpation over right sacroiliac joint
  – Positive reproduction of pain with FABER test on right side only
  – No neurologic deficits or pain on hip or lumbar range of motion
Case Example

• Xray:
  – Mild lumbar spondylosis
  – Inferior osteophytes in right SI join

• MRI:
  – No stenosis
  – Mild facet arthropathy
Case Example

• Patient failed all reasonable non-operative options
• Minimally invasive sacroiliac joint fusion was offered
• Patient was cleared from medical standpoint
Case Example

• At 6 weeks postoperatively patient reported no pain, was off all pain medications and was released from physical therapy.
• Patient was released to full activity with no restrictions at 3 months after the surgery.
Case Example
Case Example #2

- 62 y.o. female presents with history of right buttock pain after work injury ~1.5 yrs ago
- Slipped and fell on ice (right leg folded under her) while walking in the parking lot of her place of employment.
- She was initially treated for right knee pain.
- Right hip joint pathology was ruled out by a total joint surgeon.
Case Example #2

- Two fluoroscopically-guided sacroiliac joint injections were done and resulted in significant relief for 1-2 weeks.
- SI joint radiofrequency ablation provided partial long-term relief
- Presented to my office with persistent right buttock pain that was interfering with ability to be active or sit for prolonged period of time (has a desk job with a lot of sitting).
Case Example #2

- On physical exam the patient has pain while seating or right buttock, pain on weight bearing on right leg, tenderness to palpation over the posterior right SI joint, and concordant pain with FABER mauever.
- Xray showed some degeneration in the right sacroiliac joint. CT scan showed right SIJ degeneration.
- Lumbar spine xray was age-appropriate.
Case Example #2
Case Example #2

• At presentation to my office the patient has already failed all reasonable non-operative options (PT, injections, medications).
• Minimally invasive Sacroiliac joint fusion was performed.
• Patient was discharged home on POD1
• The buttock pain has improved significantly at the first postoperative visit.
Case Example #2
Case Example #3

- 78 y.o. male presents with history of chronic right buttock pain that is worse on weight-bearing.
- Prior history of extensive right iliac crest bone graft harvesting to treat tibia fracture non-union.
- Excellent but short-term response to fluoroscopically guided right SI joint injections
Case Example #3
Case Example #3

- Patient underwent uneventful right SIJ percutaneous fusion
- He was discharged on POD1 with immediate significant resolution of right buttock pain
- Patient did not take any pain medications after discharge from the hospital
- He was full weight-bearing on RLE in 2 wks postoperatively
Case Example #3
References


THANK YOU