Sacroiliac Joint Pain: Evidence Based Diagnosis and Treatment Options

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*Paid consultant of SI-BONE, Inc.*
Program Overview

• Prevalence of sacroiliac joint pain
• How to establish the diagnosis?
• What are the treatment options?
Prevalence of SI Joint Pain

- 13 - 30% incidence of SIJ pain in LBP patients
  - Schwarzer AC. Spine 1995

- 18.5% incidence of SIJ pain in LBP patients
  - Maigne JY. Spine 1996

- 15-25% of patients with axial LBP have SI joint pain
  - Cohen SP. Anesth Analg 2005

- 27% incidence of SIJ pain in LBP patients

Bernard
Clinical Orthopedic & Related Research
1987
(N=1,293 pts)
Prevalence of SI Joint Pain

Post-Fusion$^1$ 43%

Failed Back Surgery$^2$ 29%

Diagnosing SI Joint Pain
SI Joint Diagnostic Challenges

- Presenting complaints mimic other causes of chronic LBP
  - Evaluate all possible pain generators for the lumbar spine, the hip, and the SI Joint
  - Imaging studies often inconclusive
  - Referral pain patterns for the three conditions overlap
Who Are the SIJ Patients?

• In order to understand who they are…
  – We must be able to recognize the symptoms
  – We must educate our staff
  – We must educate our referring physicians

• Is there clinical evidence for how to diagnosis?
Diagnosing Overview

- History
- Physical exam
- Differential diagnosis
- Current reference standard
History: Potential Causes

**TRAUMATIC**
- Fall
- Motor vehicle collision
- Lifting
- Pregnancy

**ATRAUMATIC**
- Adjacent Segment Disorder
  - Prior Lumbar Fusion
- Cumulative Injury
- Arthritis
- Scoliosis
- Inflammatory Arthropathy
- Infection
Physical Exam: Pain Localization

Fortin Finger Test

- Point to pain while standing
  1. Able to localize pain with one finger
  2. Within 1 cm of PSIS (inferomedial)
  3. Consistent over at least 2 trials

- Ask patient to point to location of primary pain
  - **Below L5**: Consider SIJ
  - **Above L5**: Consider lumbar spine etiologies


SIJ-related pain patterns can be similar to the L5 and S1 dermatome areas.

14% Groin
28% Lower Leg
94% Buttock
48% Thigh
12% Ankle

Primary
Below L5
Pain over PSIS

Sacroiliac Provocation Tests

Provocative Tests
1. Distraction*
2. Thigh Thrust*
3. Compression
4. FABER
5. Gaenslen’s Maneuver

* most sensitive of the tests

Diagnostic Criteria:
• 3 of 5 must be positive
  – At least 1 of 3 being Compression or Thigh Thrust

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<th>Laslett (2)</th>
<th>Szadek (1)</th>
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<tbody>
<tr>
<td>Sensitivity</td>
<td>91%</td>
<td>85%</td>
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<tr>
<td>Specificity</td>
<td>78%</td>
<td>76%</td>
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1. Diagnostic Validity of Criteria for Sacroiliac Joint Pain: A Systematic Review

2. Evidence Based Diagnosis and treatment of the painful Sacroiliac Joint - Journal of Manual & Manipulative Therapy, 2008, Mark Laslett
Diagnostic SIJ Injections

Current Gold Standard

- 22 gauge 5” styletted needle
- 0.25ml contrast medium
- 1.25ml local anesthetic
- Pain Reduction
  - ≥75% test is positive
  - 50-75% may be considered a major contributor to the patient’s pain
Conservative Treatment Options
Treatment Options

• Drugs
  – NSAIDS
  – Oral steroid taper

• Physical Rehabilitation
  – 6-8 weeks duration
  – Manual Therapy
  – SIJ Belt
  – Postural modifications

• Therapeutic Injection
  – 1-4 per year

• Radiofrequency Ablation
Structured Exercise Program

**Patient with Chronic Pain**
- Results after treatment
  - Dramatic Improvement: 65%
  - No or Minimal Improvement: 22%
  - Modest Improvement: 11%

**Disability due to Low Back Pain**
- Results after treatment
  - No disability after treatment: 73%
  - Some or no change after treatment: 27%

**2 year outcomes:**
- Physical therapy exercise produced good long-term results
- Chronic or Disability due to LBP saw no to modest improvements
- This subset could be due to an underlying disruption

**SI Joint Injections**

**Maugars 1996**
- Only randomized control study
- Spondylarthropathy patients diagnosed with sacroiliitis

SI Joint Injections

Hawkins 2009

- 4 or more injections: 23%
- One injection: 34%
- 2-3 injections: 43%

Average duration between injections: 8.5 months

RF for SI Joint Pain

Patel, et al. 2011

- 51 Patients randomized 2:1

* $P < 0.05$ comparing means between treatment and sham groups

RF for SI Joint Pain

Cheng et al. 2012
- 88 patients
  - 30 traditional RF
  - 58 cooled RF

Cohen et al. 2008
- 28 patients

“...benefit constrained by nerve regeneration to between 6 months and 1 yr.”
Treatment Options

Recurrent Pain?

– May have underlying disruptions

• Disruptions can cause instability through:¹
  – ligamentous laxity
  – tearing of the joint capsule
  – up to 61% of patients had capsular tears²,³

• Is there another option?

¹ Laslett, M. Evidence-Based Diagnosis and Treatment of the Painful Sacroiliac Joint. J Man Manip Ther. 2008; 16(3): 142–152.
Sacroiliac Joint Fusion
SI Joint Fusion

- Minimally Invasive iFuse Implant System®

- Vs. Open SI Fusion:
  - Small incision
  - Reduced blood loss
  - Short procedure length
    ~ 1 hour
  - No need for bone grafting
Why the unique triangular design?

- Cannulated screw may loosen \(^1,2,3\)

Design: Triangle vs. Round

- Porous titanium plasma coating allows for biologic fixation
- Larger surface area designed to stabilize and fuse the heavily loaded SI joint
- 3X stronger than screw \(^4\)

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1. The Effects of Cyclic Loading on Pull-Out Strength of Sacral Screw Fixation: An In Vitro Biomechanical Study
iFuse Procedure Outcomes

3 year: Early and Sustained\(^1\)

Pain Scores

*How much pain are you in at this time?*

\(0=\text{No pain}; \ 10=\text{Worst pain imaginable}\)

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Patient satisfaction

82% at 40 Months

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* Dr. Rudolf is a paid consultant and has an ownership interest in SI-BONE, Inc.
iFuse Procedure Outcomes

Improved Back Function
(ODI mean %)

-37.5 point drop

Baseline (n=18) 6 wk (n=5) 3 mo (n=10) 12 mo (n=18)

89%

Achieved Substantial Clinical Benefit (SCB)


*Paid consultant of and conducts clinical research for SI-BONE Inc.
iFuse Procedure Outcomes

Multiple Studies: High patient satisfaction


*Paid consultant of SI-BONE, Inc.; †Conducts clinical research for SI-BONE Inc.; §Ownership interest in SI-BONE Inc.; ±Recipient of an SI-BONE research grant.
Indications & Risk Statement

Indications:
• The iFuse Implant System is intended for sacroiliac joint fusion for conditions including sacroiliac joint disruptions and degenerative sacroiliitis.

Risk Statement:
• As with all surgical procedures and permanent implants, there are risks and considerations associated with surgery and use of the iFuse Implant. Please review the iFuse Instructions for Use for a complete discussion of contraindications, warnings, precautions, and risks.
Summary

• Prevalence – 15 to 30% of all LBP
• Diagnosis – Battery of tests and SI joint injection
• Treatment options:
  – Conservative care:
    1. Physical Therapy
    2. SI joint injections
    3. RF Ablations
  – MIS SI Joint Fusion:
    1. iFuse Implant System