

## Does ipsilateral SIJ fusion lead to contralateral increased stress?

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May 13, 2017



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## Sacroiliac joint fusion



*SI joint fusion using iFuse system. Photo credit spinemd.com*

- ♦ **Sacroiliac (SI) fusion may be recommended when nonspecific low back pain responds to injection of single SI**
- ♦ **Effect on contralateral stress is poorly described**
  - Reoperation rates
  - Patient satisfaction
  - Rates of union
  - Radiographic evidence of contralateral increased stress
  - Clinically, contralateral stress can not be directly ascertained



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## Overview

- ♦ **In vitro studies of SI joint**
  - Biomechanics of the SI joint
- ♦ **Retrospective reviews of SI joint fusion**
  - iFuse System
  - Open surgery
- ♦ **Review of literature**
  - Spiker et al 2012: Review of literature comparing injections versus surgical fusion and comparing rates of reoperation/satisfaction
  - Zaidi et al 2015: Review of SI joint fusion in MIS versus open surgery and comparing patient satisfaction, reoperation and complication rates



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**Yu et al. 2009**

♦ **Biomechanical effects of transverse partial sacrectomy on the sacroiliac joints**

- Cadaveric studies of partial sacrectomies to examine axial compressive and torsional stiffness
- Model of tumor resection
- 1/2 of SI joint is required to reduce compressive instability
- However no clear evidence to determine percentage contribution of ligaments/etc to the overall stability of the sacrum




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**Retrospective review of unilateral fusion**

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**Rudolf 2012**

♦ **Sacroiliac Joint Arthrodesis-MIS Technique with Titanium Implants**

- 50 patients, retrospective review
- Minimally invasive fusion using iFuse system (SI-Bone); plasma coated titanium implants
- Improvement in quality of life
- 5 patients underwent bilateral fusion
- No reported increased contralateral stress

Table 4. Results: Quality of Life Outcomes

	Baseline		3 Month (n=40)		6 Month (n=41)		12 Month (n=27)		ANOVA p
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Pain	7.6	0.92	2.75	0.76	2.66	0.76	4.29	0.75	<0.001
Light activities	5.8	2.09	2.90	2.44	2.72	2.61	2.81	0.81	<0.001
Moderate activities	7.8	1.88	3.59	3.5	3.61	3.61	2.59	0.81	<0.001
Vigorous activities	8.9	1.29	3.54	2.87	4.08	3.50	4.32	0.991	
Stair	4.8	0.17	3.18	3.28	3.07	3.09	3.77	3.77	<0.001
Walking	9.9	0.41	3.71	0.03	3.08	0.09	4.26	0.326	
Overall happiness	6.3	1.91	3.68	2.49	3.32	2.39	3.37	0.922	
Social function	5.2	0.32	3.96	0.39	4.22	0.36	4.18	0.498	
Pain effect on social function	7.1	0.43	3.68	0.87	3.37	0.82	3.86	0.86	<0.001

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**iFuse Implant System**  
Minimally Invasive Sacroiliac Joint Surgery

**It's time to get your life back.**

**Patients**

Don't let lower back pain stop you from living your life. Did you know that up to 25% of chronic lower back pain is caused by the sacroiliac joint? If you're having symptoms that may be related to your sacroiliac joint, talk to your doctor about your options including the iFuse Implant System® ("iFuse"), an option for some causes of SI joint pain or dysfunction. SI joint treatment using the patented triangular design of the iFuse Implant™ has produced unparalleled clinical results. More than thirty published, peer-reviewed articles demonstrate safety and effectiveness of the iFuse Implant. The iFuse Implant is the only SI joint fusion device with multiple clinical studies demonstrating that treatment improved pain, patient function, and quality of life.\*

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**Buchowski et al. 2005**

♦ **Functional and radiographic outcome of sacroiliac arthrodesis for the disorders of the sacroiliac joint**

- 20 consecutive patients undergoing modified Smith-Petersen osteotomies
- Significant improvement in SF-36 scores
- 85% fusion rate
- No comment on contralateral symptoms or contralateral revision surgery



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**Literature Reviews**

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## Spiker et al. 2012

### ♦ Surgical versus injection treatment for injection-confirmed chronic sacroiliac joint pain

- Review of the literature 1970-2012
- 12 articles included; 7 surgical, 5 injection related (botox, steroids, prolotherapy)
- Limited in ability to compare across studies due to the different scoring systems
- Very low return to work rate
- 82.4% of patients with marked/severe pain at 39 months after SI joint fusion
- Did not comment specifically on rates of contralateral stress or if the reoperations were due to contralateral joint stress

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## Spiker et al. 2012

Compare pain, functionality, quality of life, and return to work for surgical vs injection treatment of injection-confirmed sacroiliac joint pain.

Outcomes	Strength of evidence	Conclusions/comments
1. Improvement in pain		Regardless of the type of treatment, most studies reported over 40% improvement in pain as measured by VAS or NRS score
2. Improvement in functionality		Regardless of the type of treatment, most studies reported over 20% improvement in functionality
3. Return to work		Two fusion and one injection study reported over 40% of patients returning to work at follow-up

Compare complications for surgical vs injection treatment of injection-confirmed sacroiliac joint pain

Outcomes	Strength of evidence	Conclusions/comments
1. Treatment related		Most complications were reported in surgical studies, including infections, numbness, further surgery, and intraoperative fracture. Only one injection study reported complications (flu-like symptoms in the Botalinum toxin arm of the study)

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## Zaidi et al. 2015

### ♦ Surgical and clinical efficacy of sacroiliac joint fusion: a systematic review of the literature

- 16 journal articles
- 131 patients open surgery, 299 MIS
- Patient satisfaction, reoperation rates, complications, rates of fusion
- Scales/scoring varied widely across groups for all measures
  - VAS vs. ODI vs. SF-36 for satisfaction
  - Reviewed plain radiographs and CT scans
- Reoperation rates
  - Open surgery: 0-65%
  - MIS: 0-17%
- Patient satisfaction rates
  - Open surgery: 18-100%
  - MIS: 73-100%

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## Zaidi et al. 2015

TABLE 6. Major complications in 299 patients treated with MIS

Complication	No. of incidents (no./100 cases)
New-onset facet joint pain	8 (2.7)
Trochanteric bursitis	7 (2.3)
Deep wound infection	5 (1.7)
New-onset low-back/buttocks pain	5 (1.7)
Worsening leg/knee pain	5 (1.7)
Superficial cellulitis	4 (1.3)
Radiculopathy	3 (1.0)
Large hematomas	3 (1.0)
Vascular necrosis of hip	2 (0.7)
Priformis syndrome	2 (0.7)
Implant penetration into sacral neural foramen	2 (0.7)
Peripheral neuropathy	1 (0.3)
Non-displaced fracture	1 (0.3)
Pulmonary embolism	1 (0.3)
DVT	1 (0.3)

DVT = deep vein thrombosis.

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## Summary

- *In vitro* biomechanical studies support the concept of increased compressive stress when an SI joint is compromised in the setting of bony resection
- Retrospective case studies focus on outcome of index joint with little data on contralateral joint symptoms
- Literature review data is limited due to variations in data collection and scoring used for outcomes
- **CONCLUSION:** *There is no high-quality evidence to support the theory that unilateral SI joint fusion leads to contralateral increased stress*

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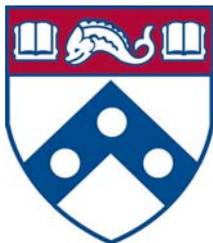
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