



# Is minimally invasive sacroiliac joint arthrodesis the treatment of choice for sacroiliac joint dysfunction?

M. Burhan Janjua<sup>1,2</sup>, Sumanth Reddy<sup>1</sup>, William C. Welch<sup>2</sup>, Peter G. Passias<sup>3</sup>

<sup>1</sup>Department of Pediatric Neurosurgery, UT Southwestern Medical Center, Dallas, TX, USA; <sup>2</sup>Department of Neurosurgery, University of Pennsylvania Hospital, Pennsylvania, PA, USA; <sup>3</sup>Department of Orthopedic Surgery, NYU Langone Health, New York, NY, USA

*Correspondence to:* M. Burhan Janjua, MD. Neurosurgery Fellow, Division of Pediatric Neurosurgery, Department of Neurosurgery, UT Southwestern Medical Center, 1935 Medical District Drive, Dallas, TX, USA. Email: mburhanj@gmail.com.

*Provenance:* This is an invited article commissioned by the Section Editor Ai-Min Wu (Department of Orthopaedics, The Second Affiliated Hospital and Yuying Children's Hospital of Wenzhou Medical University, Key Laboratory of Orthopaedics of Zhejiang Province, The Second School of Medicine, Wenzhou Medical University, Wenzhou, China).

*Comment on:* Dengler J, Kools D, Pflugmacher R, *et al.* Randomized Trial of Sacroiliac Joint Arthrodesis Compared with Conservative Management for Chronic Low Back Pain Attributed to the Sacroiliac Joint. *J Bone Joint Surg Am* 2019;101:400-11.

Submitted May 20, 2019. Accepted for publication Jun 11, 2019.

doi: 10.21037/jss.2019.06.01

**View this article at:** <http://dx.doi.org/10.21037/jss.2019.06.01>

Among causes of low back pain, sacroiliac joint pain has historically been neglected in terms of understanding, diagnosis, and available treatment options. Sacroiliac joint dysfunction is a significant source of disability and functional impairment in elderly, and research suggests that the impact on quality of life may be comparable to other surgically treated conditions, including lumbar spinal disease and hip osteoarthritis (1,2). Furthermore, several studies have determined that lumbar/lumbosacral fusion is associated with the development of sacroiliac joint dysfunction (3-5). Recent scientific and technical advances have increased our collective understanding of sacroiliac joint dysfunction and inspired new efforts to define optimal treatment approaches (6,7).

In the present study, Dengler *et al.* report the two year follow up results from a prospective, open-label, multicenter randomized control trial examining the efficacy of sacroiliac joint arthrodesis with triangular titanium implants (8). The 52 patients who underwent the minimally invasive operation had significant improvements in low back pain (visual analog scale) and back dysfunction (Oswestry Disability Index) compared to the 51 patients who underwent conservative management with 6 months of physical therapy. Importantly, the investigators measured other adjunctive measures of pain and function at the two year follow up. This included lower rates of opioid use,

improvement in functional outcome measures such as walking distance and work status, and improvements in quality of life in the SIJ arthrodesis group compared to the conservative management group.

Notably, over one-third of patients in this study had a history of prior lumbar arthrodesis, which is consistent with the notion that lumbar/lumbosacral fusion is a risk factor for the development of sacroiliac joint dysfunction (3-5). However, patients who had undergone a spinal operation within 12 months of the screening evaluation were excluded from this study. Although it is unclear how many potential participants were excluded due to recent lumbar arthrodesis, further evaluation into the safety and efficacy of early SIJ arthrodesis may be warranted given the higher prevalence of sacroiliac joint degeneration in this specific population.

After 6 months, 21 patients in the conservative management group (43%) crossed over to the sacroiliac joint arthrodesis group, with comparable levels of improvement to the patients who were originally assigned to the operation. The subsequent analysis for the conservative management group was performed using a last-observation-carried-forward approach. This could have significantly skewed the follow up results of the conservative management group, either strengthening or weakening the relative impact of the conservative therapy on the primary and secondary outcomes. However, the authors assert

that patients in the conservative management group who did show clinical improvement in low back pain started showing improvement “as early as the first three months.” In contrast, patients who crossed over to sacroiliac joint arthrodesis “had almost no mean improvement in pain and the ODI by 6 months”. This evidence suggests that patients who crossed over were unlikely to show further improvement with conservative management, and the last-observation-carried-forward approach did not likely skew the results in favor of the treatment group.

Despite these promising results, the generalizability of this data is unclear due to lack of information regarding baseline degree of SI joint degenerative disease process and the patient comorbidities. Although the results have been stratified based on smoking status, the impact of chronic medical conditions such as diabetes, osteoporosis, and cardiovascular disease on the safety of SIJ arthrodesis and the durability of postsurgical outcomes is necessary to further validate these results. Similarly, participants were excluded from this study if there were any other sources of lower back pain during the initial evaluation. However, it is unclear if and how these exclusion criteria were applied uniformly between institutions.

This is the second prospective randomized control trial to report favorable outcomes two years after sacroiliac joint arthrodesis with triangular titanium implants, and both studies were sponsored by the manufacturer of the iFuse Implant System, SI-BONE (9). Similar to this study, the prior study by Polly *et al.* had a very high crossover rate (89%) at the six-month visit, and the analysis did not account for the impact of comorbid medical conditions on pain and functional outcomes (10). Conversely this study magnifies the adverse events or complications in SIJ arthrodesis like any other surgical procedure. These avoidable complications were related to the study device or the procedure like gluteal muscle hematoma or nerve impingement or hardware loosening. We also have observed similar complications from our experience and can be avoided. Care has to be taken to avoid excessive manipulation through the gluteal musculature. Violation of the sacral canal or the sacral hiatus should be avoided which could result in neural impingement. Hardware loosening mandates removal and requires SIJ arthrodesis with long iliac screws through the posterior approach. Unavoidable complications listed were low back due to the disc herniation, or lumbar facet arthropathy, hip pain due to trochanteric bursitis, and recurrent SIJ pain or contralateral SIJ degenerative arthritis. Despite the promising results

of these two studies, these limitations prevent the results from being generalizable to the larger subset of patient population. Prior to widespread adoption, future studies with a bigger patient sample must further clarify the ideal target population of this surgical technique.

## Acknowledgments

None.

## Footnote

*Conflicts of Interest:* The authors have no conflicts of interest to declare.

*Ethical Statement:* The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

## References

1. Cher D, Polly D, Berven S. Sacroiliac joint pain: burden of disease. *Med Devices (Auckl)* 2014;7:73-81.
2. Cher DJ, Reckling WC. Quality of life in preoperative patients with sacroiliac joint dysfunction is at least as depressed as in other lumbar spinal conditions. *Med Devices (Auckl)* 2015;8:395-403.
3. Yoshihara H. Sacroiliac joint pain after lumbar/lumbosacral fusion: current knowledge. *Eur Spine J* 2012;21:1788-96.
4. Katz V, Schofferman J, Reynolds J. The sacroiliac joint: a potential cause of pain after lumbar fusion to the sacrum. *J Spinal Disord Tech* 2003;16:96-9.
5. Ha KY, Lee JS, Kim KW. Degeneration of sacroiliac joint after instrumented lumbar or lumbosacral fusion: a prospective cohort study over five-year follow-up. *Spine (Phila Pa 1976)* 2008;33:1192-98.
6. Eno JJ, Boone CR, Bellino MJ, et al. The prevalence of sacroiliac joint degeneration in asymptomatic adults. *J Bone Joint Surg Am* 2015;97:932-6.
7. Sembrano JN, Polly DW Jr. How often is low back pain not coming from the back? *Spine (Phila Pa 1976)* 2009;34:E27-32.
8. Dengler J, Kools D, Pflugmacher R, et al. Randomized Trial of Sacroiliac Joint Arthrodesis Compared with Conservative Management for Chronic Low Back Pain Attributed to the Sacroiliac Joint. *J Bone Joint Surg Am* 2019;101:400-11.

9. Duhon BS, Bitan F, Lockstadt H, et al. Triangular Titanium Implants for Minimally Invasive Sacroiliac Joint Fusion: 2-Year Follow-Up from a Prospective Multicenter Trial. *Int J Spine Surg* 2016;10:13.
10. Polly DW, Swofford J, Whang PG, et al. Two-Year

Outcomes from a Randomized Controlled Trial of Minimally Invasive Sacroiliac Joint Fusion vs. Non-Surgical Management for Sacroiliac Joint Dysfunction. *Int J Spine Surg* 2016;10:28.

**Cite this article as:** Janjua MB, Reddy S, Welch WC, Passias PG. Is minimally invasive sacroiliac joint arthrodesis the treatment of choice for sacroiliac joint dysfunction? *J Spine Surg* 2019;5(3):378-380. doi: 10.21037/jss.2019.06.01