Abstract

Title: *Novel Surgical Technique for Sacroiliac Joint Fusion in Persistent Chronic Low Back Pain*

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Introduction: Sacroiliac joint pain can be a source of debilitating low back pain and has been well documented to be a component of chronic low back pain with a prevalence of 15-30% [1-5]. Moreover, it has been reported that 32-43% of patients with persistent or new-onset low back pain after receiving lumbar fusion surgery attribute the pain to the sacroiliac joint [6-9]. One potential explanation for this could be due to adjacent segment degeneration as a result of increased strain in the region post-lumbar fusion. Studies have shown that 75% of post-lumbar fusion patients showed sacroiliac joint degenerative changes on CT scan 5 years after vs. only 38% in age- and gender-matched controls that did not undergo lumbar fusion [10]. Diagnosing sacroiliac joint pain can be done clinically. A complete history, a positive Fortin Finger Test, and a positive result to 3 out 5 provocative tests (Distraction, Thigh Thrust/Shear, FABER, Compression, Gaenslen's) are indicative of a positive diagnosis of sacroiliac joint pain. Historically, treatment has ranged anywhere from physical therapy, to injections, to operative management. As time has progressed, surgical techniques have greatly improved as well, from large open procedures to percutaneous pinning to the minimally invasive fusion techniques we use today.

Case Description: We present a 76 year old Caucasian female with a history of chronic low back pain and several lumbar fusion procedures, down to the sacrum, that complains of worsening low back/sacroiliac pain in addition to left lower extremity pain. The patient underwent an extensive course of non-operative treatment that included activity modification, home exercise and physical therapy, as well as sacroiliac joint injections that have only provided minimal relief and have failed to last greater than 6 months. On physical exam, the patient demonstrated positive findings consistent with sacroiliac joint dysfunction including positive SI compression, shear, and Gaenslen's test, as well as a positive Fortin Finger Test. CT Scan of the pelvis revealed advanced degenerative changes of the left sacroiliac joint. Surgical management was deemed to be the most beneficial management at this time.
In the operating room, the patient was positioned prone and the left sacroiliac joint was prepped and draped using appropriate sterile technique. Intraoperative fluoroscopy was then used to localize the joint. The skin and subcutaneous tissues were anesthetized. A pin was placed in the right PSIS and the tracking array was secured to the pelvis for intraoperative navigation. CT guided navigation was utilized to assist in localization of the joint. Incision was then made posteriorly and the posterior SI joint was decorticated. A guide pin was placed within the left SI joint and intraoperative navigation was used to confirm the position within the joint. Through a separate fascial incision, morselized iliac crest bone graft was obtained and packed intra-articularly within the joint. Next, an allograft bone dowel was then impacted into the SI joint under direct visualization. Attention was then turned to the left lateral trans-iliac fixation. Again using intraoperative navigation, three guidewires were inserted traversing the left SI joint. Once appropriate trajectory, length, and position were achieved, trans-iliac sacral fixation was inserted across the SI joint in a trajectory to allow for cortical fixation of the outer ilium in addition to fixation across the SI joint and sacral ala.

Discussion: This case demonstrates a novel minimally invasive technique to sacroiliac fusion in the setting of persistent low back pain. The use of the bone dowel provides better fixation as well as a true fusion of the joint in comparison to simply percutaneous pinning. Post-operatively, our patient was neurovascularly intact and hemodynamically stable, with pain well controlled. Her recovery involved using a rolling walker for 3 weeks and she was able to return to full activity, with no restrictions, in only 6 weeks demonstrating improved patient outcomes relative to past techniques.

Sources:

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