Sacroiliac Joint Fusion

Minimally invasive sacroiliac (SI) joint fusion is indicated for low back pain from the SI joint that is due to degenerative sacroiliitis and/or sacroiliac joint disruption. This technique is safe and effective in relieving pain uncontrolled by nonoperative management1-4. There is some controversy, but there continues to be increasing evidence of effectiveness.

Description: This procedure is performed, with the patient under general anesthesia and in the prone position, using fluoroscopy or 3-dimensional (3D) navigation such as cone-beam computed tomographic (CT) imaging. After navigation setup, a navigated probe is used to approximate the desired location of each implant and trajectory. These positions are marked on the skin, and the skin is incised. A 3 to 5-cm lateral incision is made. The gluteal fascia is bluntly dissected to the outer table of the ilium. A guide pin is passed across the SI joint and into the center of the sacrum lateral to the neural foramina, which is confirmed with imaging. This is then drilled and broached. Triangular titanium rods are placed. Typically, 3 implants are placed, 2 in S1 and 1 in S2. Multiplanar postplacement imaging of the pelvis is obtained. The wound is irrigated and closed in layers.

Alternatives: Nonsurgical alternatives have been reported to include pharmacological therapies, such as nonsteroidal anti-inflammatory drugs, therapeutic SI joint blocks5, and physical therapy, such as core stabilization, orthotics (SI belts), and radiofrequency ablation1,2,6-8. The surgical alternative is an open anterior or posterior approach with SI joint arthrodesis. The anterior approach differs by the resection of the SI joint cartilage, the use of a plate or screws across the joint for stabilization, and the packing of bone graft to facilitate fusion9. These are more morbid and have a much longer recovery.

Rationale: Conservative management for SI joint pain is inadequate for all patients. Having 3 of 5 positive physical examination maneuvers7, having confirmatory diagnostic block(s)10, and ruling out the hip or spine as the pain generator provide a success rate of >80%. These patients have early and sustained clinically important and significantly improved outcomes across varying measures compared with conservative treatment1-4,11,12.

Expected outcomes: Patients can expect to experience decreased pain, reduced disability, increased daily function, and improved quality of life soon after the procedure is performed. These patients typically have an improvement of ≥50% in the Oswestry Disability Index score and a clinically significant decrease in visual analog pain scores13. The procedure appears durable through at least 5 years14. Complete pain relief is rare, but clinically important improvement is typical.

Important tips: Proper setup of the navigation system or fluoroscopy is needed to ensure accurate starting points.For 3D navigation, use a reference pin in the contralateral posterior superior iliac spine.Although navigation is used, radiographic images are made periodically to confirm proper placement of guide pins and implants. Images provide the greatest benefit when establishing navigation, after guide-pin placement when an outlet view allows for evaluation of pin depth, and after implant placement to confirm proper placement.Blood loss is generally low, but care should be taken to avoid vascular injury. Although rare, improper placement has led to injury of the superior gluteal artery15 and iliac artery16. This can be avoided by staying in bone.Proper placement of the implant is imperative in this procedure. There is the potential for nerve injury with improper placement of the implant: an L5 nerve injury if the implant is too ventral or an S1 or S2 nerve injury if the implant is too deep and into the foramen. Revision surgery is commonly due to nerve root impingement and/or malpositioning.Preoperative 3D imaging is indicated when it is necessary to rule out differential diagnoses that mimic SI joint pain. This enables the surgeon to rule out intrapelvic pathology, assess sacral bone density17, and identify dysmorphic sacra or transitional vertebrae [1)].

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Polly DW Jr, Holton KJ. Minimally Invasive Sacroiliac Joint Fusion: A Lateral Approach Using Triangular Titanium Implants and Navigation. JBJS Essent Surg Tech. 2020 Oct 19;10(4):e19.00067. doi: 10.2106/JBJS.ST.19.00067. PMID: 33204578; PMCID: PMC7665262.