

Surgical Techniques Evolution and Indications for Sacroiliac Joint Fusion

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ABOUT THE STUDY

Sacroiliac (SI) joint fusion is a surgical procedure intended to alleviate pain and improve the stability of the sacroiliac joint, where the sacrum (the triangular bone at the base of the spine) connects to the iliac bones of the pelvis. The fusion procedure involves the permanent joining of the bones of this joint to prevent movement that may cause pain or discomfort. The surgery is typically recommended after conservative treatments, such as physical therapy or injections, have been exhausted.

The primary goal of sacroiliac joint fusion is to eliminate motion at the SI joint, which can often be a source of chronic lower back pain. Given the important role of the sacroiliac joint in transferring weight between the upper body and legs, SI joint fusion surgery focuses on stabilizing this junction to reduce inflammation, pain, and other complications related to joint instability.

Surgical techniques evolution

Although the early history of sacroiliac joint fusion has been omitted, contemporary techniques have seen significant advancements. Today, minimally invasive techniques have become the preferred method due to shorter recovery times, reduced risk of complications, and improved outcomes compared to open procedures. These modern approaches utilize smaller incisions and specialized instrumentation to position implants within the joint. The development of imaging technologies like intraoperative fluoroscopy has further contributed to the precision and success of these surgeries.

Indications for SI joint fusion

Though we are not discussing the specific causes of SI joint dysfunction, SI joint fusion is typically considered for individuals with persistent, debilitating pain that has not responded to non-surgical treatment. The decision to proceed with surgery depends on a comprehensive evaluation of the patient's medical history, physical examination, and imaging results. Surgeons assess various factors, such as the degree of joint instability, wear, and degeneration, to determine whether surgery is the most appropriate treatment.

Patient evaluation and diagnostic considerations

Proper diagnosis is critical to the success of sacroiliac joint fusion surgery. Given the complex and multifactorial nature of lower back pain, distinguishing sacroiliac joint dysfunction from other potential sources of pain (such as lumbar spine issues or hip pathology) can be challenging. Diagnostic tools that are often used in evaluating SI joint dysfunction include physical examination maneuvers, imaging studies (such as X-rays, CT scans, and MRI), and diagnostic injections.

Diagnostic injections, where anesthetic is injected into the SI joint, serve as an important tool for confirming the joint as the pain source. If the patient experiences temporary pain relief after the injection, it is indicative that the SI joint may be the cause of the discomfort. This confirmation helps guide the decision to proceed with fusion surgery.

Surgical tools and instrumentation

Minimally invasive sacroiliac joint fusion procedures rely on advanced surgical tools designed for precision and safety. Some of the tools and implants used in the procedure include:

Guidance systems: Modern surgical techniques often employ intraoperative fluoroscopy or other imaging technologies to help the surgeon precisely locate and place the implants.

Cannulated instruments: These are specialized tools that allow the surgeon to create a small, accurate path to the SI joint through which the implants can be placed.

The use of cannulated instruments and advanced imaging reduces the risk of damage to surrounding tissues and improves the accuracy of implant placement.

Benefits and advantages of sacroiliac joint fusion

Sacroiliac joint fusion provides numerous benefits for patients suffering from chronic SI joint pain, especially when other treatments have failed to provide long-term relief. Some key advantages include:

Reduction in pain: The primary benefit is the alleviation of pain caused by abnormal movement or instability in the SI joint. By fusing the joint, motion is eliminated, and inflammation is reduced.

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Improved mobility: Although fusion limits movement at the SI joint, many patients experience improved overall mobility because their pain is significantly reduced or eliminated, allowing them to resume physical activities that were previously limited.

Considerations in implant selection

The choice of implant material and design is an important consideration in sacroiliac joint fusion. The implants must be biocompatible and promote osseointegration, the process by which the bone grows into and around the implant, creating a stable fusion. Titanium is often used because of its strength, durability, and biocompatibility. Additionally, some implants are coated with materials designed to improve bone growth and promote faster fusion.

Implants may come in different shapes and sizes, allowing surgeons to choose the most appropriate option for each patient based on their anatomy and the extent of joint damage. The

implant design can influence how well the fusion progresses and how much stability it provides during the healing process.

Rehabilitation and postoperative care

While the focus here excludes detailed recovery protocols, rehabilitation plays a key role in the success of sacroiliac joint fusion surgery. Patients are typically encouraged to gradually resume activity, and physical therapy may be recommended to help improve mobility and strength in the lower back and pelvic region. Rehabilitation is customized based on the patient's overall health, the extent of the surgery, and the surgeon's recommendations.

Postoperative care involves the management of pain, inflammation, and other symptoms. Patients may require bracing or other assistive devices in the early stages of recovery to protect the fusion site and promote healing. Physical therapy often focuses on strengthening the surrounding muscles and improving the patient's overall stability and posture.