



Analysis of 2 Years of Sacroiliacal Joint Fusions, Does the Patient Selection Matter?

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Abstract

Background: Lumbar fusion surgery and multiple operative segments are interdependent risk factors for postoperative Sacroiliac Joint (SIJ) pain. For patients with chronic low back pain originating from the SIJ, minimally invasive SIJ-fusion with triangular titanium implants is a management option for relieving pain. The aim of our study is to analyze the complications, comorbidities and overall result of pain in patients undergoing sacroiliac joint fusion.

Material and Methods: With a percutaneous minimal invasive technique were treated 30 patients over a 2 years period, 22 women and 8 men with a mean age of 45 years (range 25 to 86).

Results: The VAS pre- and postoperatively showed for pain a p-value = 0.045, with 95% CI (0.237, 0.542) revealing a statistically significant systematic improvement in pelvic pain. At follow-up 18 patients reported a higher quality of life and those they were sleeping better than pre-operatively. One patient had a haematoma that required evacuation, one patient developed a paralytic Ileus which improved under conservative management after 3 days and one patient had a superficial abscess related to the closure stitches.

Conclusion: The SI-Joint fusion is a minimal invasive procedure that helps in the treatment of hypermobility or arthrosis in the SI-Joint. However it is of great importance to carefully select the patients before performing this procedure.

Keywords: Sacroiliac joint fusion; Minimal invasive; Pain relief

Background

Lumbar fusion surgery and multiple operative segments are interdependent risk factors for the postoperative Sacroiliac Joint (SIJ) pain. The incidence of postoperative SIJ pain also increases in patients with lumbar stenosis compared with lumbar disc herniation and lumbar spondylolisthesis [1]. For patients with chronic low back pain originating from the SIJ, minimally invasive SIJ-fusion with triangular titanium implants was safe and more effective than conservative management in relieving pain, reducing disability, and improving patient function and quality of life. A challenge in this kind of procedure is how to identify patients with presumed SIJ joint pain within the low back pain group [2-6]. The aim in this study is to analyze the complications, comorbidities and overall result of pain in patients undergoing sacroiliac joint fusion.

Methods

Over a 2 year period there were treated 30 patients, 22 women and 8 men with a mean age of 45 years (range 25-86). All patients had undergone long periods of treatment including physiotherapy, manipulation, needling, pelvic belt, massage and chiropractic without success, and 10 had been operated on various spinal diagnoses without improvement. The patients underwent thorough neurological investigation, plain X-ray and MRI of the spine and plain X-ray of the pelvis. In addition, all patients underwent a percutaneous mechanical provocation test and extra-articular local anesthetic blocks against the posterior part of the SI joints. The patients were operated using the percutaneous minimal invasive iFuse Implant System[®] from the SI-Bone[®] company. The entire procedure was performed through a small incision (approximately 5 cm to 6 cm long), between the side of the ala and the longitudinal axis from the sacrum (Figure 1). During the procedure, fluoroscopy was used to facilitate precise placement of the implants. Normally three implants were used, depending on the size of the patient. We utilized the program JMP-7. Analysis of descriptive statistics was completed obtaining measures of central tendency and dispersion of all the variables.

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Figure 1:



Figure 2:

For the comparative analysis, we used the Student's t-test for continuous variables with normal distribution and the Wilcoxon/Kruskal-Wallis test for continuous variables without normal distribution [7]. The patients rated their level of pelvic and leg pain with the Visual Analogue Scale (VAS, 0-10).

Results

At follow-up 18 patients reported a lower level of pelvic pain than before surgery, 8 the same level and 4 a higher level. The VAS pre- and postoperative showed for pain a p-value = 0.045, with 95% CI (0.237, 0.542) revealing a statistically significant systematic improvement in pelvic pain. At follow-up 18 patients reported a higher quality of life and reported that they were sleeping better than pre-operatively. In most patients the character of the pelvic pain was dull and aching, often accompanied by a stabbing component in connection with sudden movements. Referred pain down the legs even to the feet and toes was noted by 20 patients. One patient had a haematoma that required evacuation, one patient developed a paralytic Ileus which improved under conservative management after 3 days and one patient had a superficial abscess related to the closure stitches.

Discussion

In this 2 year study, 60% of the patients described an improvement of the pelvic, lumbar and leg pain. The main point for success in the procedures was the challenging patient selection. Moreover a third of the patients underwent another spinal procedure such as lumbar spine fusion with screw-rod system and even a Central Spine Cord Stimulation System (CSSS) maybe due to a misdiagnosis in the past (Figure 2). However an improvement of pain was reported in the VAS as being rather just a discomfort mainly in patients with higher age and longer duration of SIJ-pain. Nonetheless patients who smoked or had used > 1 year predicted a lower degree of improvement. Both factors are well known as predictors for chronic back pain [8-12]. In the study there was cautiously selected the patients for this kind of procedure based in their medical history avoiding patients who had used opioids > 1 year or patients who smoked [12]. Furthermore this

percutaneous procedure affords pain relief in a minimal invasive procedure with short hospital stays in patients suffering hypermobility or arthrosis in the SI-Joint. A disadvantage of this technique is in the case of an infection the difficulty in removing the implanted hardware [8]. However the complications following this procedure were (16%) and therefore considered as relative safe manoeuvre SIJ- pain relief. No hardware was needed to be removed in our study. The overall results showed an improvement in pain after minimal invasive SIJ-Fusion. Patients who smoke or have need opioids > 1 year should be avoided for this kind of treatment and should be preferred to be further treated conservatively [8-12].

Conclusion

The SI-Joint fusion is a minimal invasive procedure that helps in the treatment of hypermobility or arthrosis in the SI-Joint. However it is of great importance to select carefully the patients before performing this procedure because of the presence of comorbidities such as smoking and opioid use > 1 year that predict a bad outcome in pain relief.

Declarations

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent: Informed consent was obtained from all individual participants included in the study.

Competing interests

All authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing

arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

Authors' contributions

VRJ: Carried out main manuscript writing, data collection as well as literature research.

MGF: Contributed with figures and tables as well as manuscript writing.

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