Original Article

Sacroiliac Joint Syndrome

Sacroiliac Joint Syndrome in the Differential Diagnosis of Low Back Pain and Sciatica

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ABSTRACT

Background: Sacroiliac Joint syndrome (SIJS) is an extraspinal cause of low-back and lower-extremity pain that can present in so many different ways. The constellation of symptoms attributed to SIJS includes pain referral to numerous anatomic regions. Specific pain referral zones reported include the Posterior superior Iliac Spine (PSIS),(1) lower Lumbar Region,(2,3,4,5,6,7) Buttock,(3,,4,7,13,14,21) Groin and Medial Thigh(13,21), Posterior Thigh(8,13,14,22) Lower Abdomen (9,14), Calf and foot.

Objectives: To determine the origin of pain of the sacroiliac joint and to differentiate it from pain due to degenerated lumbar disc disease.

Study Design: Long term, prospective study

Place and Duration of Study: This study was conducted in the Department of Neurosurgery, Women Medical College, Abbottabad from August 2006 - July 2013

Materials and Methods: Fifty Three patients who satisfied clinical criteria and demonstrated a positive diagnostic response to sacroiliac joint injections were included in an attempt to solve the dilemma in neurosurgical patients when differentiation between discogenic pain and one origination from sacroiliac joint(Sacroiliac joint syndrome - SIJS) is difficult. Clinical and radiological differentiation were not so remarkable between two conditions and based on these the diagnosis can go either way. Each patients' pre-injection pain description was used to determine areas of pain referral and then sacroiliac joint was blocked by injections to see whether patients are still experiencing the Discogenic pattem of LBP and sciatica.

Outcome Measures: To block sacroiliac joint by injection and then Invoking patients' pain by clinical tests to see the origin of pain.

Results: Seventeen men (36.0%) and 36 women (64.0%) were included with a mean age of 42.5 years (range, 20 to 75 yrs) and a mean symptom duration of 18.2 months (range, l to 72 months). Twenty patients (37.73.0%) described buttock pain and 33 patients (62.26%) described lower lumbar pain. Groin pain was described in 7 patients (13.20.0%). Twenty-five patients (47.16%) described associated lower-extremity pain. Fourteen patients (26.41.0%) described pain distal to the knee, and 6 patients (11.32%) reported foot pain. A statistically significant relationship was identified between pain location and age with younger patients more likely to describe pain distal to the knee. It was possible to identify a patient population consisting 15 patients (28.30%) who were actually suffering from SIJS and their treatment streamlined accordingly. After treating the sacroiliac joint and restoring symmetrical hip rotation, these patients no longer complained of low back pain.

Conclusion: Pain referral from the sacroiliac joint does not appear to be limited to the lumbar region and buttock. The variable patterns of pain referral observed may arise for several reasons, including the joint's complex innervation , sclerotomal pain referral, irritation of adjacent structures, and varying locations of injury with the sacroliasjoint.

Key Words: Low back pain, sacroiliac joint syndrome(SIJS), sacroiliac joint block. Diagnostic Accuracy, Intra articular Injection.

INTRODUCTION

The relationship between the sacroiliac joint (SIJ) and low back pain and sciatica is not new and some regard SIJ pain as a major contributor to the low back pain problem with others regarding it as unimportant or irrelevant.[2] About 13% of patients with persistent low back pain have the origin of pain confirmed as the SIJ.[3] Movement and positional abnormalities of the SIJ and their treatments have appeared in the manual therapy, manual medicine, osteopathic, and chiropractic literatures from the 19th century onwards.[4,5] The prevalence of these disorders is reported as being about 20% in college students[23] and between 8 and 16% in asymptomatic individuals.[24] There is a need to clarify the distinction between anatomical and biomechanical abnormalities, ie.SIJ dysfunction, and pain arising from the SIJ, and its relation to the common complaint of low back and referred pain into the buttock, pelvis, and lower extremity and this becomes more important from the perspective of neurosurgical community.

The evidence favoring the perspective that mechanical SIJ dysfunctions are related to the experience of back and referred pain is convincing. The range of motion in

the SIJ is small, less than 4 degree of rotation and to 1.6 mm of translation.[14,21]

There are two clinical perspectives to consider: SIJ as a load-transferring mechanical junction between the pelvis and the spine that may cause either the SIJ or other structures to produce painful stimuli, and the SIJ as a source of pain. The first perspective proposes that the joint is malfunctioning in some manner and the word dysunction is commonly used to encapsulate the complexity of aberrations believed to occur.

A large number of clinical tests have been proposed to assess movement or asymmetry of the SIJ. While some are sensitive, others are highly sensitive.

Sensitivity is the proportion of patients with the disease in question who have positive tests. Specificity is the proportion of patients without the disease in question who have negative tests.

A test with high sensitivity and low specificity cannot beused to make a diagnosis because of the high proportion of with positive tests but negative to the reference standard: there is a high false positive rate. A test with high specificity and low sensitivity is useful in making the diagnosis, but large proportion of cases positive to the reference standard will have negative tests; i.e., there is high false negative rate.[19,20] Consequently, if making the diagnosis of SIJ dysfunction is the objective, tests for dysfunction need to have high specificity with respect to an acceptable reference standard.

A reference standard for diagnosing SIJ pain was recommended in 1994 by the International Association Society for the Study of Pain (IASP).[17] IASPs three diagnostic criteria were:

l. Pain is present in the region of the SIJ.

2. Stressing the SIJ by clinical tests that are selective for the joint reproduces the patient's pain.

3. Selectively infiltrating the symptomatic joint completely relieves the patient of the pain.

The optimal technique of injection was established in 1992 (48) and is described in the current edition of the practice guidelines issued by the International Spine Intervention Society."[16] Diagnostic blocks are appropriate for confirming a possible diagnosis or differentiating between the two diagnoses confusing the clinician. In this paper, an attempt is made to use this knowledge in simplifying the clinical picture when SIJS is a possible clinical entity in the differential diagnosis of Lumbar Disc Degenerative disease.

MATERIALS AND METHODS

Fifty three cases underwent Sacroiliac joint blockade by Lidocaine/Bupivacaine +/- corticosteroid Injection Therapy between August 2006 - July 2013 by the author for Low back pain targeted at the sacroiliac joint and are part of this long term study. Patients with electrodiagnostic evidence of an acute lumbosacral radiculopathy or peripheral neuropathy or radiographic evidence of spondylolisthesis or lumbar instability were excluded.

RESULTS

Age Incidence: The mean age was 21.5 years. Out of 53 patients, 3 were under 15 years, and another 18 were between 16 and 34 years.

Sex Incidence: out of the 53 patients, 17(32.07%) were male and 36(67.92%) were female (ratio 14:2). Weight of the patients was between 45 to 76 kg with the mean weight of 62.78 kg.

Clinical Features: Seventeen men (36.0%) and 36 women (64.0%) were included with a mean age of 42.5 years (range, 20 to 75 yrs) and a mean symptom duration of 18.2 months (range, l to 72 months) . Twenty patients (37.73.0%) described buttock pain and 33 patients (62.26%) described lower lumbar pain. Groin pain was described in 7 patients (13.20%). Twenty-five patients (47.16%) described associated lower-extremity pain. Fourteen patients (26.41.0%) described pain distal to the knee, and 6 patients (11.320%) reported foot pain. (Table 1).

Table No.1: Patient's Data

Total Study Population	53
Duration Of Study	April 2006-July 2013
Age	
Range	13-66 years
Mean	42.5 years
Sex	
Male	17
Female	36
Pain Distribution	
Buttock	20
Lower Lumbar	33
Associated Groin	07
Associated Lower Extremity	25
Associated Distal to the knee	14
Associated Foot	06
Pain Duration	
Range	18.2 Months
Mean	1-72 Months

All patients were subjected to following non-invasive clinical testing for SIJ pain after SIJ blockade to see whether these tests still provoked usual or familiar pain of which the patient complains. These tests have been shown to possess acceptable levels of reliability provided that they are highly standardized.(7,13,22)

1. The distraction test (testing right and left SIJ simultaneously)

2. The sacral thrust test (testing right and left SIJ simultaneously).
3. The drop test (testing the left SIJ).

Management

Diagnostic Injections: Those who failed to improve following at least 4 weeks of the conservative Analgesia, rest and physiotherapy regimen underwent a diagnostic sacroiliac joint block (SIJB) which was done in all 53 patients. Approximately 15 minutes before this procedure, a pain drawing and visual analogue scale (VAS) rating was completed.

Injection technique: Diagnostic sacroiliac joint injections were performed using the technique of Hendrix. During each injection, blood pressure and pulse were recorded. Patients were prepped and draped in the usual sterile manner. In all cases, a small amount of the substance in question was injected subcutaneously to test the patients reaction to exposure. There were three patients excluded due to proven allergy to Local Anesthetic drugs (Figure 1).

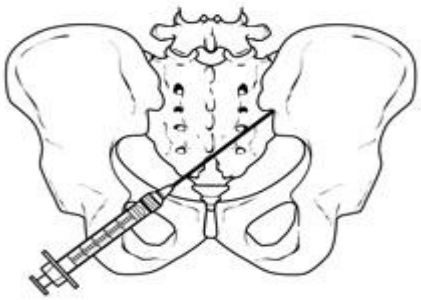

Figure No.1: Direction of Approach to Sacroiliac Joint

A skin weal was raised with I% Xylocaine at the needle insertion site. A 3.5-in 22-gauge needle was advanced in a media direction to achieve joint entry at the medial aspect of the medial or posterior joint line where 2cc of 2% Lidocaine hydrochloride was injected (Figure 1).

Within 30 minutes of the SIJ block, each patient completed a post injection VAS under supervision. Immediately preceding completion of this VAS, the patient was required to assume any position or perform any maneuver that typically provoked low-back pain and/or leg pain. A minimum reduction of 80% in the VAS rating was required to be considered a positive response, indicating SIJS. Following pain referral zones were recognized: Posterior superior Iliac Spine (PSIS), lower Lumbar Region, Buttock, Posterior Thigh, Calf and foot in our set of patients.

Those patients demonstrating a positive diagnostic response were then referred for Physiotherapy and the negative response patients joined the work up for Lumbar degenerative disc disease.

Corticosteroid injections were given as these are minimally invasive and appear to be effective in a proportion of cases of SIJ pain especially if there is imaging evidence of sacroilitis.

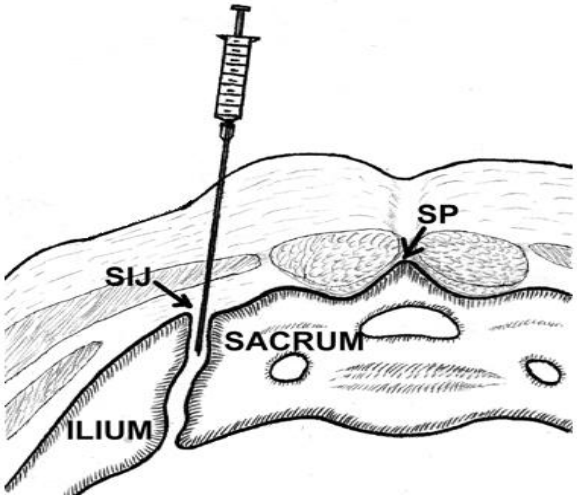

Figure No.2: Change Of Direction Once Inside the Joint

Outcome: Purpose of this study was to Invoke patients pain post injection block of SIJ to see the origin of pain. Eight patterns of pain referral were observed. A statistically significant relationship was identified between pain location and age, with younger patients more likely to describe pain distal to the knee. It was possible to identify a patient population consisting of 15 patients (28.30%) who were actually suffering from SIJS and not from Lumbar Disc Degenerative disease and their treatment streamlined accordingly. After treating the sacroiliac joint and restoring symmetrical hip rotation, these patients no longer complained of low back pain.

DISCUSSION

Sacroiliac joint syndrome (SIJS) is an extraspinal cause of low back and lower-extremity pain that can present in different ways. The constellation of symptoms attributed to SIJS includes pain referral to numerous anatomic regions. Specific pain referral zones reported include the posterior superior iliac spine (PSIS),[1] lower lumbar region[2,3,4] buttock,[3,4,21], groin and medial thigh,[21], posterior thigh[14], lower abdomen[9,14] calf, and foot.

There are several potential explanations for the apparent varied pain complaints presenting in SIJS which confuses it with lumbar disc degenerative disease pain. The sacroiliac joints variable innervation has been previously described and may result in complex symptom referral.[10] Varying sclerotomal pain[11,12] referral patterns may also arise from injury to distinct locations in the sacroiliac joint.[15] Additionally, the Piriformis muscle situated in close proximity to the sacroiliac joint, may be affected by intrinsic joint pathology, resulting in pain of muscular origin and/or associated sciatic nerve irritation.[7]

Previous descriptions of sacroiliac joint pain referral zones have been based upon a diagnosis of SIJS established through history and physical examination findings. Using provocative intra-articular injections, the pain referral patterns of the sacroiliac joint in asymptomatic individuals has been demonstrated.[1] Patterns of pain referral, encompassing the entire lower limb, have also been described in symptomatic individuals responding to intra-articular diagnostic injections.[9]

Tests that stress the SIJ in order to provoke familiar pain can reliably identify extra-articular sources of pain. Three or more positive pain provocation SIJ tests have sensitivity and specificity of 91% and 78%, respectively. Specificity of three or more positive tests increases to 87% in patients whose symptoms cannot be made to move towards the spinal midline, ie centralize. In chronic back pain populations, patients who have three or more positive provocation SIJ tests and whose symptoms cannot be made to centralize have a probability of having pain of 77% and in pregnant populations with back pain, a probability of 89%. This combination of test findings could be used in research to evaluate the efficacy of specific treatments for SIJ pain as well as differentiate it from Discogenic lumbar and leg pain. Treatments most likely to be effective are specific lumbopelvic stabilization training and injections of corticosteroid into the intra-articular space. Non-invasive clinical testing for SIJ pain rests on pain provocation tests that stress the SIJ structures and provoke the usual or familiar pain of which the patient complains. The key tests (distraction, compression, thigh thrust, and sacral thrust) have been described in detail in previous publications.[22]

1.The distraction test (testing right and left SIJ simultaneously)

2.The sacral thrust test (testing right and left SIJ simultaneously)

3. The drop test (testing the left SIJ)

These test possess acceptable levels of reliability provided that they are highly standardized. Neural blockade and similar injection procedures often are prescribed for therapeutic benefits however, they also can be useful for diagnostic, prognostic, or prophylactic indications, or for a combination of these purposes.

Diagnostic blocks often help the treating practitioner determine the anatomic origin of the patient's pain. These procedures also may facilitate differentiation of a local from a referred somatic pain source, a visceral from a somatic pain source, or a peripheral from a central etiology. Selective blocks can help determine which peripheral tissues are primary pain generators.

Practitioner criteria; A practitioner who intends to perform these injections should be qualified by education, training, and experience to diagnose and manage the specific disorder(s) to be treated. Knowledge of the natural history and expected clinical disorders are compulsory pre requisite. The treating practitioner should be aware of alternative or accessory therapies that can be applied before or following procedural intervention, and which may enhance the efficacy of treatment.

Procedure: The optimal technique of injection is described in the current edition of the practice guidelines issued by the International Spine Intervention society".[16] Prior to performing or even scheduling injection procedures, the practitioner is obliged to assess the patient thoroughly and all such information should be documented. He should inform the patient fully regarding technique, indications for the procedure, operative complications, typical time for convalescence, and cost.

Further objective and meaningful information can be obtained using preoperative and postoperative visual analogue scales (VAS), pain and disability scales, quality of life measures, and injection-specific questionnaires. Furthermore, the use of adjunctive guidance such as electromyography (EMG), ultrasound, and radiologic studies is recommended in some cases.

Local infiltration for neural blockade of a joint was accomplished by using dilute concentrations of LAs, as they rapidly penetrate the various tissues around targeted nerve endings.

Epinephrine is the agent most often combined to prolong or modify the action of LAs, which have a short to moderate duration of action.

The latency of onset of anesthetic action, concentration, total dose, distance between the injection site and target, and relative penetrance of the compound were considered when choosing the type of LA used in this study. Lidocaine was used mostly in our case because of its rapid onset, and tissue penetration. Bupivacaine was also used in some patients due to an advantage that altering the concentration of bupivacaine can elicit a separate sensory or motor neural blockade, ie, lower concentrations primarily induce a sensory block whereas higher concentrations cause motor blockade but with precaution in patients with cardiac history.

Corticosteroids are among the most commonly used active substances for spinal intervention. Particulate steroids were not used as when injected into foraminal spinal artery, can cause paralysis, even death.(28) Adverse reactions from corticosteroid injections like dizziness, nervousness, facial flushing, insomnia, and transient increased appetite were monitored by us and other researchers.[29]

CONCLUSION

Neurosurgical dilemma of differential diagnosis between SIJS and Low Back pain with Sciatica can be solved by invoking patients' low back pain and sciatic component by SIJ stress tests after blocking the joint post injection. We were able to identify a patient population in this way, consisting of 15 patients

(28.30%) who were actually suffering from SIJS and their treatment streamlined accordingly. At least five patterns of pain referral were observed. A statistically significant relationship was identified between pain location and age, with younger patients more likely to describe pain distal to the knee. After treating the sacroiliac joint and restoring symmetrical hip rotation, these patients no longer complained of low back pain.

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