The Diagnosis And Treatment Of The Sacro-Iliac Joint As A Cause Of Low Back Pain — The Management Of Pain In The Butt

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There is very little written about the Sacro-Iliac joint (S.I.) in medical books on backache. As Orthopaedic and Neurosurgical residents are not taught to consider S.I. dysfunction as a cause of back pain, it is not surprising that surgeons know little of diagnosis and treatment. The structure of the S.I. joint is confusing; the upper posterior ligamentous portion is a space in which the sacrum and ilium are not in contact, while the anterior and lower half is a typical synovial joint lined with hyaline cartilage. It is neither hinge nor ball and socket, rather, a sliding joint with motion too small to measure, so it is overlooked as a moving joint, vulnerable to injury. Its nerve supply is from L2 to S3 and pain may be well localized with referral to the groin, or distally into the leg as an ill-defined sensation radiating to the toes.

Much is written about the S.I Joint in Physical Therapy literature and that is how I became interested. A local senior P.T. who regularly treated my patients asked why I consistently overlooked physical signs she could elicit and I was challenged to find orthopaedic solutions when disabling symptoms persisted after prolonged focal P.T. treatment. I soon discovered why the diagnosis of sacro-iliitis had been so completely discarded following the publication by Mixter and Barr in 1934 of their concept of radiculopathy caused by herniation of the inter-vertebral disc. The diagnosis of herniated nucleus pulposus (H.N.P.) is relatively simple whereas the S.I.J. mimics conditions of the hip and spine. In practice, although clinical examination can give a strong presumption of S.I.J. injury, the differential diagnosis has to exclude other causes of pain, and the examiner has to be open-minded that lumbar disc and S.I.J. injury may coexist.

Orthopaedic literature reported that in a series of over 1200 patients, 22.5% had SI pain as their primary source, coexisting with facet joint and discogenic pain. Radiologist Charles Aprill reported that in 500 patients, about 8% with non specific back pain, the SI joint was thought to be the primary and dominant source of symptoms. SI joint pain in pregnancy is physiological and rarely persists after delivery.

History

Direct trauma to the buttock, such as a fall off a ladder landing on one side, may cause S.I.J. injury. Being rear ended in an auto accident may damage the S.I.J. as may a head on crash with the foot pressed on the brake. Twisting the trunk with the foot locked — indeed all the incidents that may cause disc injury — may damage the S.I.J.

Symptoms may provide clues to the interested examiner. Buttock pain while turning over in bed is quite consistent and so is the need to sit on the opposite buttock. These are not typical symptoms of herniated disc. Many patients state that the hip feels unstable or has given way, and as a result, some patients have fallen and suffered other injuries. Pain radiation into the groin or anterior thigh is very common and led to suspicions of calculi and even lower thoracic disc herniation as possible etiology. Intermittent symptoms of mild sciatica occur all the way to the toes, usually affecting the S 1 distribution.

Examination

The examination begins with the patient standing and finger pointing to the location of their pain. Many will indicate the S.I. sulcus, below the iliac crest. Facet induced pain is often felt above the crest and true sciatica follows a radicular path. Pain is felt on side bending and extending as this stresses the posterior elements, but this will also be positive in facet syndrome. Other spinal movements may be reduced, but flexion will not cause sciatica as in H.N.P. The patient will often be reluctant to hop on the affected side, fearing that they will fall.

Sitting exam will show no reflex, motor or sensory signs in the legs, and the straight leg raising (S.L.R.) will be 90°, unlike a herniated disc. With the patient supine, next examine the flexed hip for signs of acetabular disease. The flexed, abducted, externally rotated hip (Patrick's Test), at the end of range is painful, but beware of pain from shortened adductors. The posterior pelvic thrust test is done by quickly applying force to the knee towards the couch when the hip is flexed at 90°. Pain is felt over the S.I.J. With the patient prone, compare discomfort from pressure over the lumbo-sacral supraspinous ligament with comparable pressure over the S.I. sulcus.

Differential Diagnosis

1) Spinal causes for buttock symptoms include facet joint injury and lateral fissure in the lumbar disc. In older patients lateral recess stenosis and degenerative spondylolisthesis may cause buttock pain.

2) Pain arising in the hip may mimic SI joint syndrome, especially as it also appears in the groin. In young, active patients consider avascular necrosis, which may have a positive Patrick's Test and positive pelvic thrust.

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3) Muscular or myofascial syndromes can arise in gluteus maximus and medius, quadratus lumborum, and the soleus muscle, all producing strong referral patterns of pain in the region of the SI joint. This diagnosis can be established by injecting local anaesthetic into the documented trigger point followed by therapeutic passive stretching to return the muscle to its normal resting length, breaking the cycle of pain.

4) Piriformis syndrome is poorly understood. The documented pain pattern is typically in the posterior thigh and hamstring region, an ill-localized deep aching sensation, typically causing the patient to stand with hip externally rotated. It does not usually cause buttock pain.

5) The possibility of SI joint infection, tumor, or inflammatory disease must be considered, but symptoms are usually continuous and not relieved by postural change.

Management

Physical therapy provides the front line treatment with spine stabilizing and muscle energy techniques most helpful. If localized trigger points are identified, treatment by compression and passive stretching is indicated. S.I. belt bracing can be used, and in the acute phase a period of non-weight bearing on crutches may relieve severe symptoms. Nonsteroidal anti-inflammatory drugs (N.S.A.I.D.s) and ice are useful. Failure to improve with such measures after about six weeks should lead to non-invasive imaging to exclude other causes of buttock pain.

Imaging

An AP X-ray of the pelvis is needed by 6 weeks to exclude bony pathology in the hip or pelvis (Figure 1). The S.I.J. cannot be usefully studied by M.R.I. or bone scan; however lumbar M.R.I. is needed to exclude obvious H.N.P. The difficulty is that M.R.I. is only 90% reliable in identifying intradiscal pathology and buttock symptoms can be caused by annular damage, which can only be diagnosed by discography, usually recommended prior to surgery.

Figure1. C.T. scan of Discogram showing left lateral fissure in patient with left buttock pain.

After prolonged disability resistant to conservative measures, the major contribution of imaging is S.I. arthrogram (Figure 2) and injection of marcaine and steroid. It is essential that the needle be inserted at the inferior tip of the synovial portion of the joint for this test to be reliable. Injection of the fibrous joint is valueless. Typically the contrast flows around the perimeter of the joint and it may leak posteriorly, frequently flowing towards the S 1 foramen, explaining the symptoms of pseudo-sciatica. Significant relief of pain following the block is needed for positive diagnosis and patients may note improvement for several days. This test may be repeated for consistency before deciding to operate and fuse the painful joint.

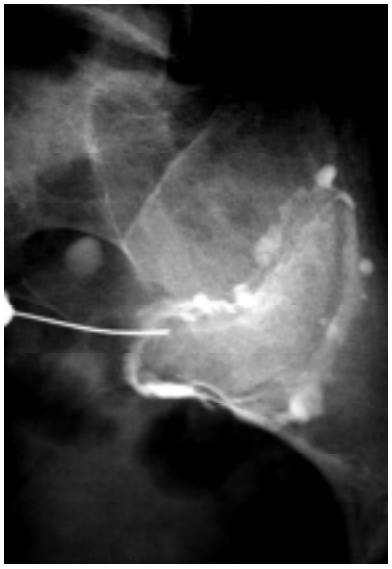

Figure 2. Right Sacroiliac Arthrogram.

Surgical Treatment

In those cases where surgery is required (as with spinal fusions) all patients must stop smoking before surgery because nicotine has been shown to impair incorporation of bone graft. They are also advised not to take aspirin or N.S.A.I.D.s which have a similar effect.

Fusing the S.I.J. may be done as described by Smith-Petersen in 1926, cutting vertically through the pelvis into the joint, curetting out the joint surfaces and impacting the bone block back into place. Using this procedure, in 6 cases only 3 fused, and 3 had to be revised. A direct posterior approach requires curetting out the joint surfaces and packing morcellated iliac crest bone chips into the decorticated joint, and using 2 cancellous lag screws carefully placed in the S1 and S2 pedicles to stabilize against rotation (Figures 3 and 4). This produced an 87% healing rate; 56% rated results as good while 31% rated results as fair. One final modification has been to pack the most anterior part of the joint with bone chips, but to fashion a thick bone block to span the more dorsal part of the joint, again stabilized with screws. The patient is kept non-weight bearing until S.I.J. pain sitting and sleeping has disappeared usually at 5 to 6 months. The results of this technique is quite promising and may approach lumbar fusion healing rates.

After radiographic evidence of healing, some patients still complain of pain due to chronic compensatory muscle

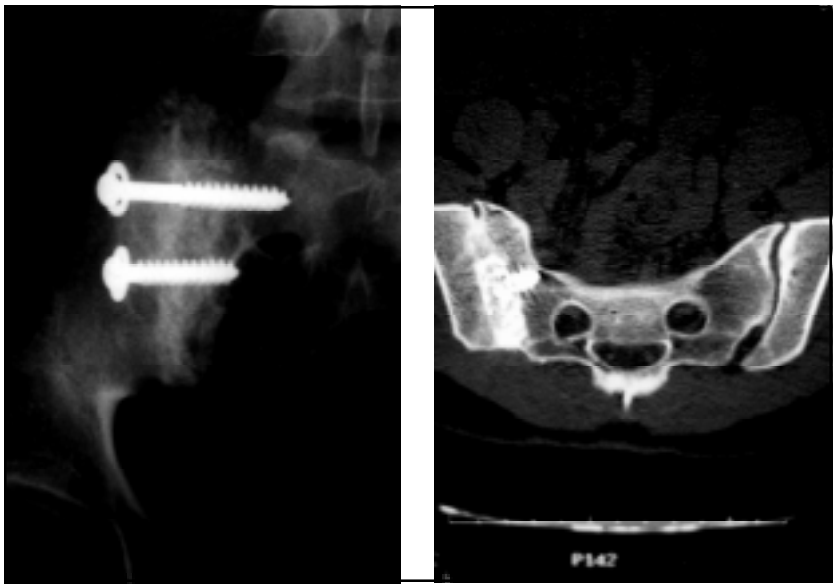

Figure 3 (Left). Right Sacro-iliac Arthrodesis. **Figure4 (Right).** C.T. scan of right Sacro-iliac Arthrodesis.

dysfunction. Long-term hip hiking may have caused mechanical pelvic obliquity, easily alleviated by muscle and fascial stretching programs.

Conclusion

Sacro-Iliac pain is a difficult condition to diagnose and treat. The informed Physical Therapist and Radiologist play a crucial role in establishing the diagnosis. Postoperative therapy may be needed to produce optimal pain relief. In the best traditions of rehabilitation it takes a team to get the job done.

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