Sacroiliac Joint Pain

Essay submitted for Master Degree of Orthopadic Surgery

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Abstract

Sacroiliac joint pain

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The sacroiliac joint is a synovial articulation between the sacral and iliac articular surfaces. The sacroiliac joint (SIJ) has been implicated as the primary pain source in 10% to 25% of the patients with low back pain. The International Association for the Study of Pain (IASP) has proposed criteria for making the diagnosis of symptomatic SIJ and are: (1) 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 and (3) selectively infiltrating the symptomatic joint with local anaesthetic completely relieves the patient of pain The main causes of sacroiliac joint pain are seronegative spondyloarthropathies, infection, tumors, pregnancy and trauma. Treatment of sacroiliac joint pain depends upon the cause. Any underlying condition would receive treatment specific for that disease. Treatment modalities include medications, physical therapy, bracing, manual therapy, injections, radiofrequency, denervation, and arthrodesis.

Key Words: Sacroiliac joint pain, Sacroiliac joint instability, Sacroiliac joint dysfunction, Low back pain, Spondyloarthropathies, Sacroiliac joint tumours.

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Abbreviation

AAOS	American Academy of Orthopedic Surgeons
ANA	Antinuclear antibody
AS	Ankylosing Spondylitis
APC	Anteroposterior compression
CM	Combined mechanical
CRP	C- Reactive Protein
CT	Computed Tomography
DCP	Dynamic compact plate
DMARD	Disease Modifying Anti-Rheumatic Drugs
DNA	Deoxynucleotideaminoacid
ESR	Erythrocyte sedimentation rate
ESSG	European Spondylarthropathy Study Group
FABER	Forced abduction and external rotation
HLA-B27	Human leukocyte antigen-B27
IASP	International Association for the Study of Pain
IBD	Inflammatory Bowel Disease
LBB	Lateral branch blocks
LBP	Low Back Pain
LC	Lateral compression
MRI	Magnetic Resonance Imaging
NSAIDs	Nonsteroidal Anti-Inflammatory Drugs
OCI	Osteitis condensans ilii
PSA	Prostate Specific Antigen
PSIS	Posterior Superior Iliac Spine
RF	Rheumatoid Factor
RFD	Radiofrequency denervation
SIJ	Sacroiliac Joint
SIJS	Sacroiliac Joint Syndrome
SpA	Spondyloarthropathies
SPEP	Serum Protein Electrophoresis
T B	Tuberculous Bacilli
Tc-99	Technetium-99
TNF	Tumors Necrosis Factor
US	United states
UPEP	Urine Protein Electrophoresis
VS	Vertical shear

WBC	White blood cell

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Intoduction

The sacroiliac joint (SIJ) has been implicated as the primary pain source in 10% to 25% of the patients with low back pain. Pain at the SIJ may arise from various etiologies. Conditions may affect the SIJ including; inflammatory disease, infections, tumors, metabolic disorders, degenerative diseases, iatrogenic conditions, referred pain, and trauma. Ankylosing spondylitis is the most common inflammatory condition that affects the SIJ. A febrile course in a patient with sacroiliac signs may be indicative of infection, particularly in a patient with a history of intravenous drug abuse. Primary or metastatic disease to the region of the SIJ will generally manifest with radiographic changes. The SIJ is a synovial joint and may be affected by metabolic conditions such as gout or pseudogout. Osteoarthritis may affect the SIJ and has a typical radiographic appearance. Degenerative changes on the radiograph are often coincidental because the discomfort produced by osteoarthritis is generally far less impressive than are the radiographs. Iatrogenic conditions include SIJ pain following bone graft harvesting procedures (***Zelle et al., 2005).***

Some clinicians believe that SIJS may also occur spontaneously without a precipitating event. However, the precipitating factors for SIJS have been well established in the published literature. To date , no studies have been published that assess the inciting events leading to the development of SIJS .Although the concept of the SIJS as a primary source of low back pain has gained widespread acceptance among interventional physiatrists and spine physicians , the evidence supporting this hypothesis is only empiric. As yet, there are no pathognomonic clinical histories or physical examination findings that unequivocally prove the diagnosis of SIJS. Without such evidence, the diagnosis previously depended only a suggestive history and / or examination ***(Chon et al., 2005).***

As well, radiological findings have been unable to consistently identify patients with SIJS, thereby falling to serve as a definitive diagnostic tool. In

addition; the clinician's reliabilities in the interpretation of radiographic finding of scurrilities are poor. Attempts have been made to utilize nuclear medicine testing. Bone scan has demonstrated a poor sensitivity, 12-46%, in diagnosing SIJS. Interestingly, even for a known inflammatory disease such as sacrollitis, appositive bone scan has not been proven to be specific.

Pain may be referred from other sites of sacroiliac joint including lumbar radiculopathy, lumbar facet joint pain, lumbar central or lateral recess stenosis, lumbar discogenic pain, hip diseases, and myofascial pain as piriformis syndrome and sacral causes as sacral stress fractures 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 (***Smith, 2006).***

Treatment of sacroiliac joint pain depends upon the cause. Any underlying condition would receive treatment specific for that disease. Treatment modalities include medications, physical therapy, bracing, manual therapy, injections, radiofrequency, denervation, and arthrodesis ***(Dreyfuss et al., 2004).***


Anatomy

The sacroiliac joint (SIJ) is a synovial articulation between the sacral and iliac articular surfaces **(Fig.1)** although often termed plane, is nearly flat only in infants; in adults the surfaces are irregular, often markedly so, and sometimes sinuous. The sacral side is lined by thick hyaline cartilage and the ilial side is lined with fibrocartilage. The anterior fibrous capsule is well formed but the posterior capsule is thinner and may have multiple plications. These are thought to result from degenerative changes over time. Five Ligaments affecting stability of the joint include the intraarticular, periarticular, and accessory ligaments.

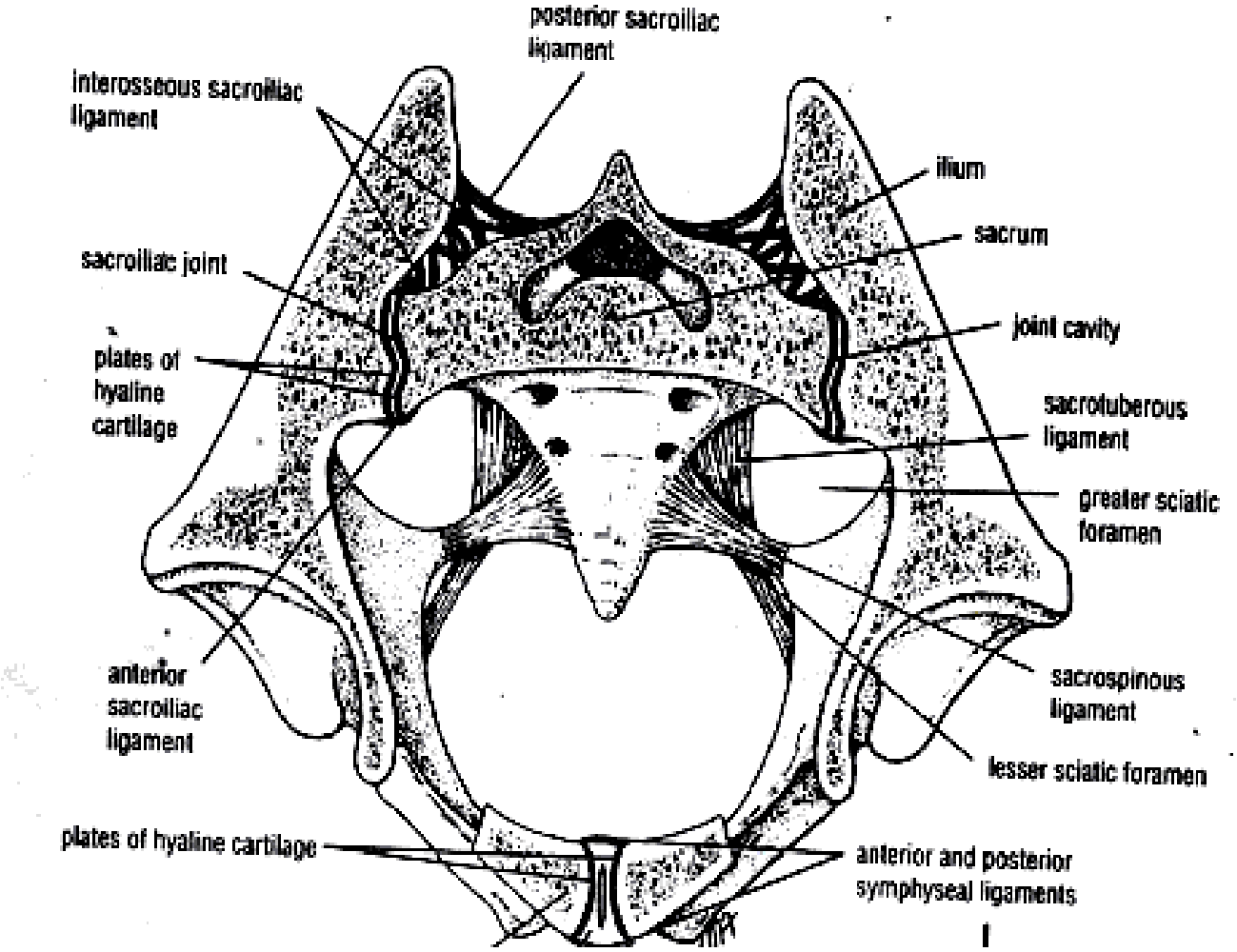

Fig 1- Horizontal section through the pelvis showing the sacroiliac joint ***(Prather and Hunt, 2004)***.

The iliolumbar ligament also affects the joint by preventing anterior translation and rotation of L5. There is great variability in external contours of the SIJ articular surfaces. They are generally auricular in form, tending to be more of a C-shape in males and an L-shape in females. With two lever arms that meet at the second sacral level where it interlocks ***(Prather and Hunt, 2004).***

Generally, the sacral surfaces are longer and narrower than the iliac surfaces. The articular surface spans from the S1 to S3 levels in both men and women, sometimes extending to S4. The joint surfaces at the S1 level are the largest, while at the S3 surfaces are smallest. Each entire SIJ surface demonstrates a surface area of approximately17.5cm^2 **(Fig. 2)**, allowing for shock absorption and a transfer of large bending forces. ***(Phillip et al., 2002).***

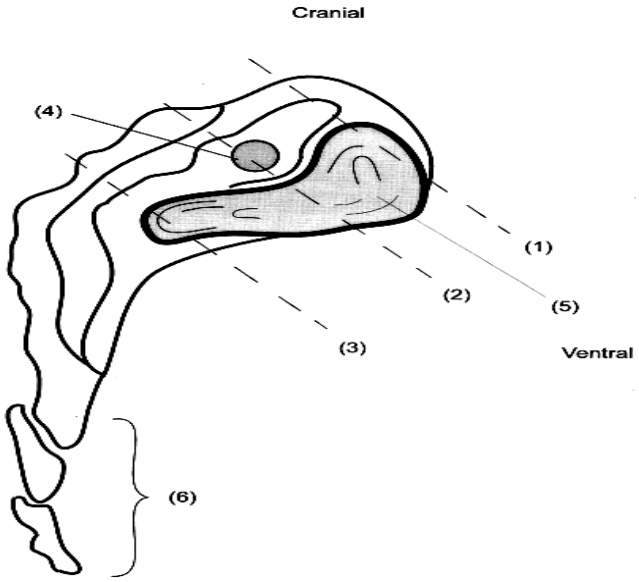

Fig. 2- Lateral view of the sacrum. (1) S1 level; (2) S2 level; (3) S3 level; (4) Location of the axial joint; (5) Sacral articular surface of the sacroiliac Joint; Note the inverted auricular shape; (6) Coccyx. ***(Phillip et al., 2002).***

Ligaments of sacroiliac joint

There are 5 Ligaments affecting stability of the joint including the intraarticular, periarticular, and accessory ligaments:

1-The anterior sacroiliac ligament:

The anterior sacroiliac ligament consists of numerous thin bands, which connect the anterior surface of the lateral part of the sacrum to the margin of the auricular surface of the ilium and to the preauricular sulcus **(Fig.3).** It restraints the external rotation of the hemipelvis ***(Williams 1995).***

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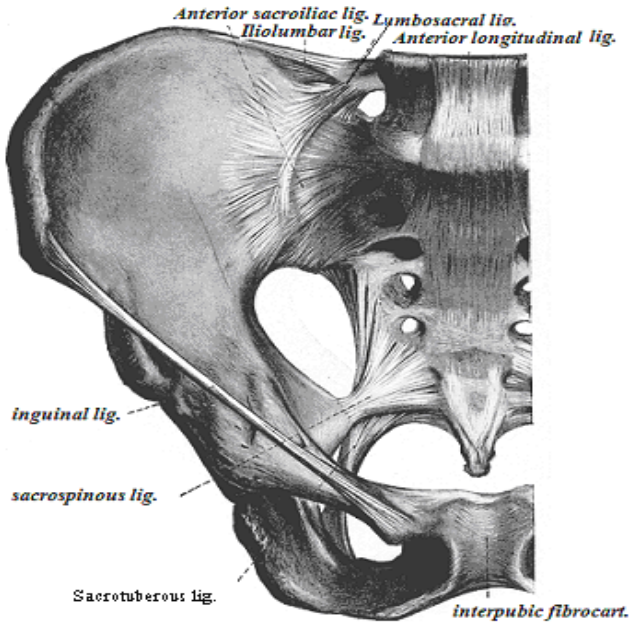

Fig. 3- Ligaments of sacroiliac joint. Anterior view ***(Williams 1995).***

2-Interosseous sacroiliac Ligament:

This ligament lies deep to the posterior ligament, and consists of a series of short, strong fibers connecting the tuberosities of the sacrum and ilium. It is the major and strongest bond between the bones, filling the irregular space posterosuperior to the joint. Its deeper part has superior and inferior bands