2. THE ROLE OF THE SACROILIAC JOINT AS A CAUSE OF LOW BACK PAIN AND DYSFUNCTION J.L. SHAW

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INTRODUCTION

Traditionally, the sacroiliac joint has been ignored when assessing causes of low back dysfunction. When the sacroiliac joint (SI joint) is discussed, it is almost always strongly excluded as a probable source of low back pain. It is fair to say that the current conventional wisdom states that the sacroiliac joint is surrounded by massive stabilizing ligaments, and has very little, if any, motion. Therefore, it cannot be a very significant cause of low back pain.
Although very actively studied at one time, study of the role of sacroiliac joints, as a cause of low back pain, was all but abandoned when Dr. 's Barr and Mixter presented, in 1934, the first evidence of herniated discs as a cause for low back pain. Since then, herniated discs have completely dominated thought as the major cause of low back pain.

In the presentation of our material, it will become apparent that an ironic paradox may exist. From our data it seems clear that discs <u>are not</u> a significant cause of low back pain, and that sacroiliac dysfunctions <u>are</u> a very common cause of low back pain.

Additional data presented will relate to the symptoms and physical diagnosis of sacroiliac dysfunction. Specific tests, used to demonstrate the presence of SI dysfunctions, will be illustrated. Also, various biomechanical and clinical consequences of sacroiliac dysfunction will be presented.

In addition, a logical thesis will be presented demonstrating that sacroiliac joint dysfunction may actually be a primary biomechanical cause of degeneration of the lower lumbar disc spaces, leading to herniation of disc material.

Figure 1A. Right ASIS depressed relative to left ASIS before correction of right SI dysfunction.

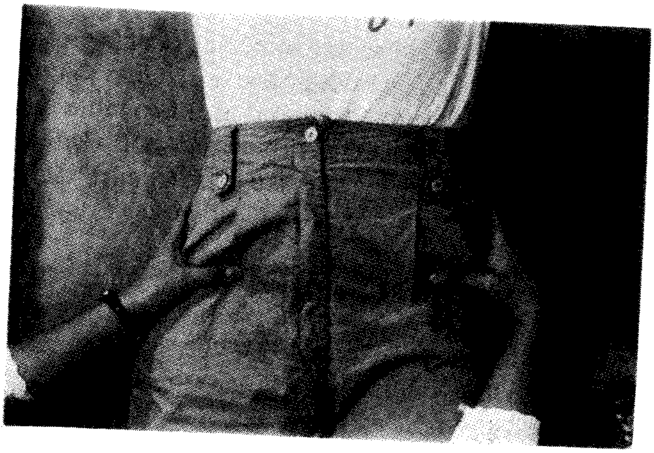

Figure 1B. Right ASIS level with left ASIS after correction of right SI dysfunction.

Figure 2A. Right PSIS high or elevated before correction of right SI dysfunction.

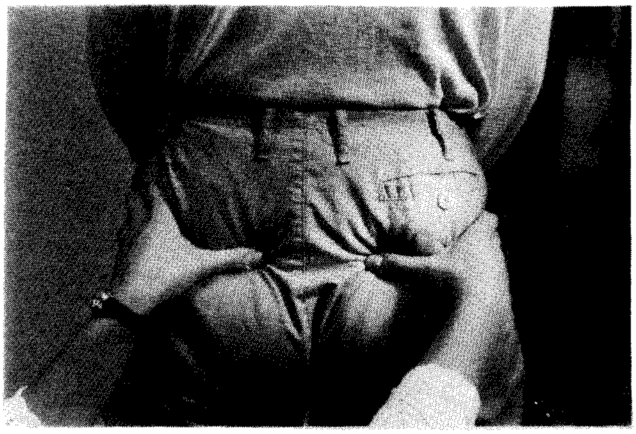

Figure 2B.
Right PSIS level with left PSIS after correction or right SI dysfunction.

Figure 3A.
Right iliac crest lower than left iliac crest before correction of right SI dysfunction.

Figure 3B.
Right iliac crest level with left iliac crest after correction of right SI dysfunction.

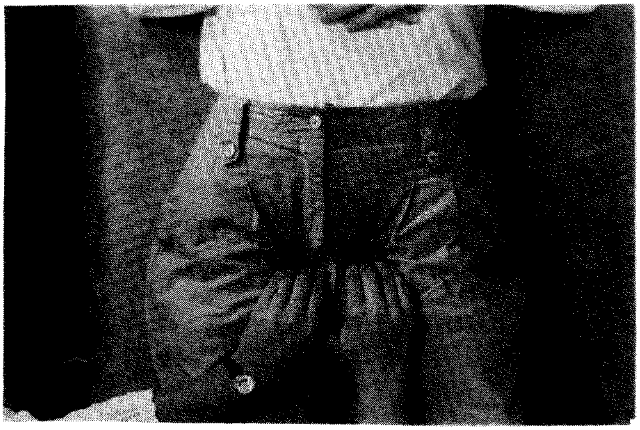

*Figure 4A.
Right pubic ramus low compared to left pubic ramus before correction of right SI dysfunction.*

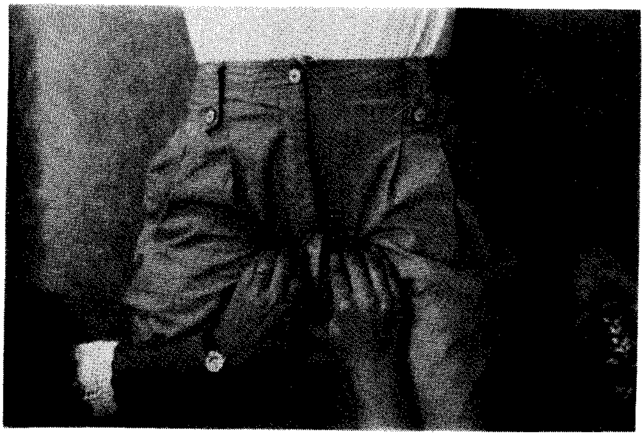

*Figure 4B.
Right pubic ramus level with left pubic ramus after correction of right SI dysfunction.*

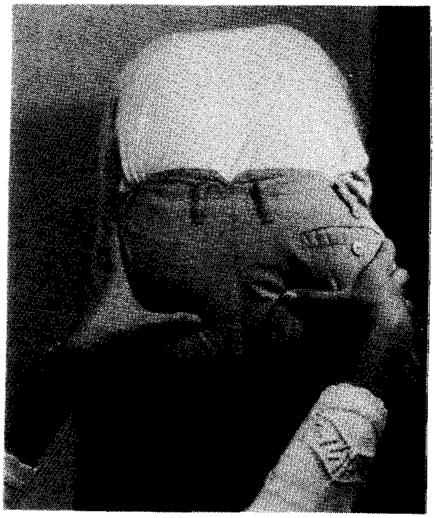

*Figure 5A.
Right PSIS rides high (elevated) on forward flexion before correction of right SI dysfunction.*

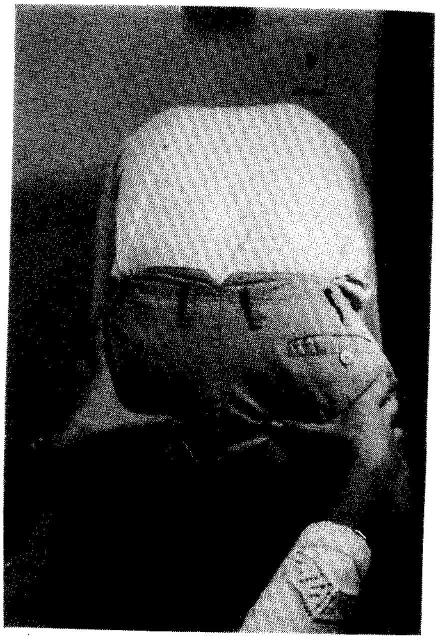

Figure 5B.
Right PSIS does not ride higher (elevate) compared to left PSIS after correction of right SI dysfunction.

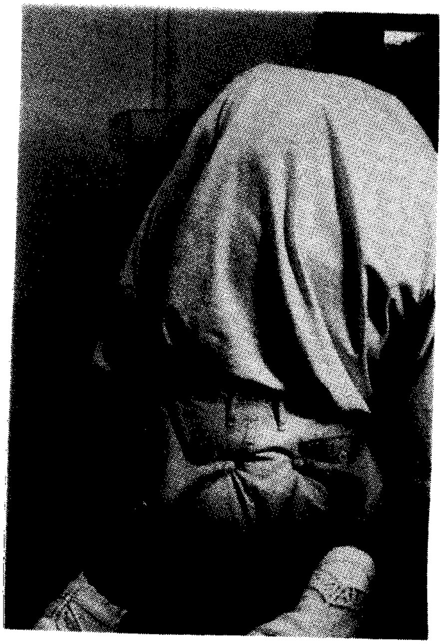

Figure 6A.
Right PSIS remains level on right side-bending before correction of right SI dysfunction.

Figure 6B.
Right PSIS dips down or depresses normally after correction of right SI dysfunction.

Figure 7.
Right pubic ramus depressed relative to left pubic ramus, in the presence of a right innominate anterior fixed rotation.

Figure 8.
Superior right iliac crest anteriorly rotated, compared to left iliac crest, in presence of right innominate anterior fixed rotation.

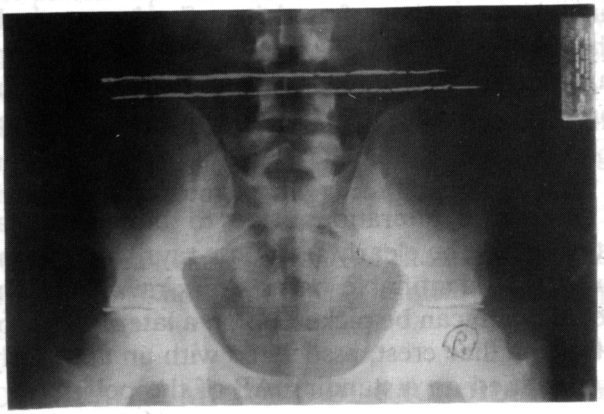

Figure 9.
Right iliac crest low, compared to left iliac crest, in the presence of a right innominate anterior fixed rotation.

PHYSICAL DIAGNOSIS OF SACROILIAC JOINT DYSFUNCTION

A sacroiliac joint dysfunction is very easily diagnosed. In the standing position, several anatomical landmarks are grossly altered and easily identified. The most common sacroiliac dysfunction is an anterior rotation of the right innominate bone around its transverse axis through the sacroiliac joint. This anterior rotation displaces the anterior superior iliac spine (ASIS) inferiorly, displaces the posterior superior iliac spine (PSIS) superiorly, and causes the right iliac crest and right pubic ramus to be lower than their counterparts. The right buttocks will not be as prominent, or full, as the left buttocks.
Tests can also demonstrate restricted SI motion. On forward flexion at the waist, the right PSIS will ride up in position relative to the left PSIS, rather than remain stationary, as normally expected. The right PSIS will remain stationary on side-bending at the waist, rather than becoming depressed caudally, as normally expected.

These physical alterations are all very easy to identify, indicating a right innominate anterior rotatory fixation. After treatment, all of these changes revert to a balanced normal alignment. The accompanying photographs (# 1, 2, 3, 4, 5 & 6) clearly demonstrate the physical findings described pre- and post treatment.

Although the right innominate anteriorly rotated fixation is the most common sacroiliac joint dysfunction, many others exist and have been clearly described. The left innominate is sometimes found in a fixed posteriorly rotated position, around the transverse axis of the SI joint. The sacrum, itself, is also subject to dysfunctions of lateral tilts, and anterior or posterior rotatory fixations. Sacral torsions, around transverse or oblique sacral axes are also found.

These clearly identifiable anatomical alterations, due to biomechanical malalignment of the SI-joints, can also be clearly seen on x-ray. The inferior displacement of the pubic ramus is identifiable on an AP x-ray. The right innominate anteriorly rotated fixation can be picked up on a lateral x-ray of the pelvis. The lower height of the iliac crest, associated with an anteriorly rotated innominate, can be identified on a standing AP of the pelvis.

These changes associated with an anteriorly rotated innominate fixation are illustrated in photographs # 7, 8 & 9.

Clearly, the presence of sacroiliac dysfunctions can be identified by both physical and radiographic diagnoses. Furthermore, after treatment of sacroiliac dysfunctions, all of the abnormal anatomical and radiographic findings are corrected with all anatomical landmarks equally balanced and aligned side to side.

It is also of interest, and significance, that the abnormal pelvic anatomical findings will vary, or alter, depending on the position in which the patient is examined. Dysfunctions found in a standing position will be considerably altered when the patient is examined in other positions, such as sitting, lying supine, or lying prone.

For example, the usual standing pattern for the right innominate dysfunction would be a fixed anterior rotation. This dysfunctional position corrects in the sitting position, only to turn into a posterior innominate fixed rotation in the supine position. Then, in the prone lying position, the innominate once more becomes fixed in an anteriorly rotated position. If the patient stays in the prone position, after a minute or two, the right innominate will frequently revert back to a fixed posterior rotation.

These variations, of the sacroiliac alignment vary depending on the patient's position, and are very important to recognize. It's not unusual to find a treater assessing a patient's findings in the standing position, and then treat them in a recumbent position. It is clear that, in many instances, the biomechanical dysfunction will have shifted, or altered, in the changing of the patient's position. Therefore, the proposed treatment, determined by the findings established in the standing position, may not be appropriate for the altered biomechanical changes presenting themselves in the recumbent position. Diagnosis and treatment are position dependent and should be carried out with the patient in the same position for both procedures.

In summary, it is easy to establish that very significant, clearly diagnosed dysfunctions occur at the sacroiliac joints.

Now we shall explore some of the more significant consequences of these dysfunctions, both in terms of clinical symptom patterns and biomechanical alterations.

CLINICAL SYMPTOMS OF SACROILIAC DYSFUNCTION

The majority of patients with sacroiliac dysfunction have pain either specifically in the area of the restricted sacroiliac joint, or in the vicinity of the opposite sacroiliac joint, which has become overworked and symptomatic in response to the fixation on the restricted side. In addition, it's very common to have pain in the region of the gluteus maximus, often extending throughout the posterolateral buttocks and posterior thigh. Pain is sometimes found extending to the knee, or down the calf and into the ankle. This pain pattern may often be misinterpreted as 'sciatic ' pain.

If the pain is at the level of the iliac crests, or more superiorly, it is due to fascial and articular restrictions in the thoracic and lumbar region, rather than sacroiliac dysfunction. Sacroiliac dysfunction symptoms are almost always below the level of the iliac crest and lumbosacral junction.
Depending on the specific biomechanical dysfunction, a patient may have more pain sitting or standing. In the sitting position, forces are transmitted through the ischial tuberosities to the sacroiliac joints. Thus, sitting causes certain specific SI dysfunctions to be strained more significantly, and therefore more painful.

In contrast, other sacroiliac dysfunctions are more symptomatic while standing with the forces coming through the femur and across the SI joint from the opposite direction. In addition, significant pain noted when getting up from a sitting position or on backward bending, may be due to a posteriorly rotated sacrum which causes impingement, or restriction of extension of the lumbar spine. A forwardly rotated sacrum, in contrast, impinges on lumbar flexion and causes pain on forward bending.

In short, the patient may note more strain and symptomatic findings when standing, sitting, getting up from a sitting position, or on forward bending, depending upon which biomechanical dysfunction exists.

THE EFFECT OF SACROILIAC DYSFUNCTION ON LEG LENGTH MEASUREMENTS

The presence of an abnormally fixed rotation of the sacroiliac joint dramatically effects one's capacity to measure true leg length inequalities. The presence of a right innominate anteriorly rotated fixation causes the right ASIS to be lower or inferiorly positioned, relative to the left ASIS. Consequently, the ASIS to medial malleolus measurement will be shorter on the right leg, when compared with the left leg.

Other sacroiliac dysfunctions cause similar measurement error. Therefore, in the presence of an SI dysfunction, clinical tape measure assessment of true leg length inequalities will usually be inaccurate.

One would think that a standing AP x-ray of the pelvis, measuring the heights of the femurs, would give an accurate true leg length measurement. However, these measurements are also inaccurate in the presence of sacroiliac dysfunction.
CT scan, orthoretinogram and MRI measurements for true leg length inequalities are also dependent on measurements through the transverse plane of the body. They too are inaccurate in the presence of sacroiliac rotational fixations. This is true because the sacroiliac rotation also rotates, or angles, the associated femur anteriorly. This causes the femur to appear short relative to the opposite femur when viewed in the transverse plane. Therefore, in the presence of sacroiliac dysfunctions, there appears to be no means of obtaining accurate true leg length measurements. One can only obtain accurate apparent leg length discrepancies, not true leg length discrepancies.

True leg length measurements can be determined only after correction of the innominate rotatory fixation, and restoration of the normal innominate position. The inaccurate nature of leg length measurements, in the presence of a SI dysfunction, especially innominate rotations, must also be considered when prescribing heel lift therapy.

RELATIONSHIP TO RESTRICTED SACROILIAC JOINT FUNCTION TO DEGENERATIVE DISC DISEASE

The sacroiliac joints have a reciprocal rotatory movement on about a 45 degree angle from the AP plane of the pelvis. This movement absorbs much of the torque and rotatory forces during ambulation. When this motion is restricted unilaterally or, particularly, bilaterally by SI dysfunction, there is a need for some other focus of dissipation of these rotational and torque movements of ambulation. The logical location for this to take place, in the absence of sacroiliac joint motion, is in the disc spaces of the lower lumbar vertebra.

Biomechanically, this results in a rotatory and torque like motion around the longitudinal axis of the intervertebral discs. The logical consequence of this excessive rotatory motion of the disc material is eventual delamination or separation of the concentric layers of the disc material. Since rotatory torque is maximum at the L4/5 disc space, maximum delamination should occur there, and next most frequently at the L5/S1 disc space. This is, in fact, what you see in the dominant pathology associated with disc herniation. As the delamination progresses, fragmentation, or fissuring eventually occurs, allowing the nucleus pulposa to ultimately extrude or rupture.

The conventional wisdom is that herniated discs are responsible for low back pain, and that sacroiliac joints do not move significantly and do not cause low back pain or dysfunction.
The ironic reality may well be that sacroiliac joint dysfunctions are the major cause of low back dysfunction, as well as the primary factor causing disc space degeneration, and ultimate herniation of disc material.

However, as you shall see in the following data, herniation of disc material is not a significant cause of low back dysfunction, in any case. In our studies, in fact, disc herniation is a very minor cause of low back pain.

TREATMENT OF SACROILIAC DYSFUNCTION AND ITS EFFECT ON LOW BACK SYMPTOMS

In our study of 1.000 consecutive patients presenting with low back pain, 98% of the patients had a mechanical dysfunction of the sacroiliac joints as a major cause of their low back pain. The most common finding was a right innominate anteriorly rotated fixation with locking, or diminished motion, in the associated sacroiliac joint. Treatment of these patients, by resolution of the dysfunction and restoration of full sacroiliac joint motion, along with correction of other dysfunctions, led to relief of symptoms in almost all cases.
A most remarkable datum was the absence of need for surgery in these patients. In our series of the 1.000 patients, only 2 patients needed surgery for treatment of herniated or protruded discs. This represents a surgical instance of 0.2%, 20 times less than the national norm of approximately 4% incidence of surgery in similar series. These statistics are good and invite immediate thought and question as to their veracity. I would like to note that there is an old Chinese Proverb that states "The protruded nail gets pounded down". Consequently we would not consider presenting this material without extremely thorough analysis, the data of which is open for anyone's review and assessment.

It is also interesting that, in long term follow up, only 5% of our patients with low back pain come back with recurrent low back dysfunction. This is true, if they stay on our prescribed maintenance program, which only requires 10 minutes of their time per day.

THE ROLE OF FASCIA AS AN INTEGRATING STRUCTURE AND ITS ROLE IN MUSCULOSKELETAL DYSFUNCTION

One final concept that needs presentation involves the realization that our bodies are made all of the same fabric. The body has to be assessed, evaluated and treated as a total entity and not just by focusing on one specific dysfunction.

It's our belief that the major cause of musculoskeletal dysfunction relates to fibrous tissue, or fascial connective tissue restrictions. We feel that, in particular, fibrous tissue restrictions in and about muscle prevents the normal stretching of muscle. When something is pulling on the muscle, the muscle is tethered by these restrictions and incapable of elongation or stretching. Therefore, when pulled on, the muscle becomes painful and stiff.

We also believe that the restricted muscle, will cause restriction of motion of its associated joint. The joint, itself, then becomes tethered, or jammed, with limited motion, and abnormal stresses. Consequently the joint also becomes painful and stiff.

In summary, fibrous tissue, or fascial, restrictions prevent stretching of muscle, and, therefore, muscle becomes painful and stiff. Restriction of the muscle, in turn, restricts joint motion and the joint becomes painful and stiff. Following this reasoning release of these fibrous tissue restrictions should lead to return of flexibility, normal muscle and joint motion and alleviation of pain and stiffness.
This is, in fact what we find. All of our treatment methods are designed specifically to release these fascial, or fibrous tissue, restrictions throughout the body and, thus, bring the body back into more anatomically neutral and balanced alignment. Flexibility is returned and pain and stiffness are resolved.

Time does not permit extensive review of our treatment methods. To the casual observer, they look much like massage, stretching, and range of motion exercises, but differ, in that they are able to get in touch with the fibrous tissue restrictions, and release them, promptly and effectively. Restrictions tend to recur, and it may take 4 or 5 treatments by a physician, as well as several treatments by other therapists, to gain lasting balance. Once lasting balance is obtained and the patient stays on a rehabilitation program, consisting of stretching exercises to be done 10 minutes a day, the patient will usually stay free of recurrent restrictions. If the patients follow through with their rehab program, we have less than 5% of our patients return with recurrent low back pain on a long term follow up.

We have come to realize that, in our clinic, we find almost every patient with low back pain to also has significant mechanical dysfunction of the cervical spine, as well as dysfunctions of the thoracolumbar spine. In addition, it is very common to have dysfunctions of the lower extremities. This is perhaps the most important and vital concept to understand in diagnosis and treatment of musculoskeletal dysfunctions - the whole musculoskeletal system needs to be treated, balanced and freed of fascial restrictions.

It is important to realize that restriction of motion, or fixation, of joints is a secondary phenomena. The primary cause of joint dysfunction lies in the fibrous tissue restrictions, throughout the body, which unbalance and jam various joint motions. Only by resolving this primary fibrous tissue restriction can we restore full, balanced joint motion. Too often, we fixate on the specific painful joint, neglecting these primary causes.

SUMMARY

1. Sacroiliac joint dysfunction is the major cause of low back pain in 98% of our patients.
2. In our studies, herniated disc material is a rare cause of low back pain, representing only a 0.2% surgical incidence.
3. Fibrous tissue, or fascial restrictions, throughout the musculoskeletal system, are the primary cause of sacroiliac joint and other joint dysfunctions causing low back pain.
4. Clinical relief of low back pain as best accomplished by release of fibrous tissue or fascial restrictions. Release of facial restrictions provided relief of low back pain in 98% of our patients.
5. We have developed a simple, safe, nonsurgical technique to release fascial restriction and relieve low back pain.
6. If our patients stay on a simple stretch program, the incidence of long term recurrence of low back pain is less than 5%.
7. The role of fascial restrictions as a cause of sacroiliac joint dysfunctions and low back pain needs to be more thoroughly appreciated, studied and understood.