



Chronic back low back pain and its relationship to the sacroiliac joint.

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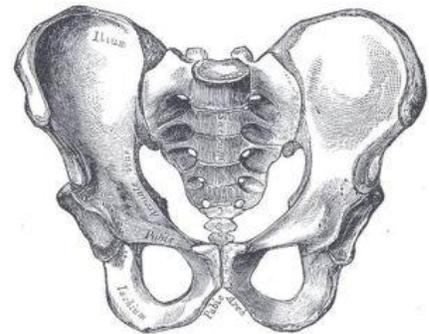
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The Sacroiliac Joint

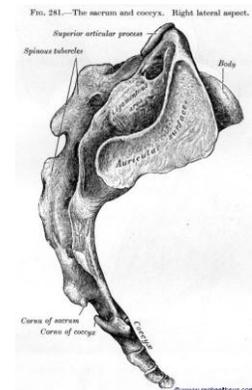
The sacroiliac joint is a relatively common source of both acute and chronic back pain. Pain arising from the sacroiliac joint can mimic "sciatic" type pain and can be often overlooked because an MRI may demonstrate an incidental abnormality that has little to do with the patient's pain. This can direct a physician's attention away from the actual problem when in fact it is the sacroiliac joint that is the source of the pain. We will begin our discussion of the SI joint by a review of anatomy.

ANATOMY OF THE SACROILIAC JOINT

The sacroiliac joint is a large boot shaped joint that sits between the sacrum (a triangular shaped bone noted in the picture to the right) and the two iliac bones also shown to the right. If you take off the ilia and look at the joint surface shown in the picture below you can see the upside down boot shaped joint surface. The joint surface of the sacrum and the ilium is covered with cartilage. There are two different types of cartilage covering this joint. One type covers the iliac portion of the joint the other type covers the sacral surface.



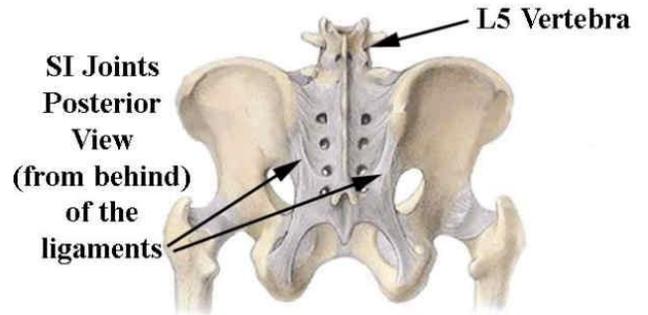
The shape of the joint varies from individual to individual. It is not uncommon to see a patient with two differently shaped sacroiliac joints right compared to left. Which is why one may have persistent pain remaining localized to only one side. An individual may have one side or the sacroiliac joint favors a stable structure and on the other side the joint may be shaped in such a manner that it can predispose the patient to additional stress on the supportive ligaments. This can lead to gradual instability over time and persistent pain. Cumulative stress secondary to excessive weight, posture, abnormal biomechanics or secondary to injuries to the joint can lead to breakdown in the ligamentous support resulting instability of the joint.



The ligaments that support this joint and the function of these ligaments are an important concept to understand pain that arises from the sacroiliac joint. There is a complex array

of ligaments that support the sacroiliac joint as seen in the picture below. These ligaments have several important functions:

1. **Support and motion control:** The support required in the pelvic girdle is quite substantial and these ligaments restrict the motion of the SI joint and allow only a minimal amount of movement. There has been a significant debate over decades about whether or not the joint is even mobile. Some have published research suggesting the sacroiliac joint is not capable of causing pain because it does not move.¹ Fortunately despite a few nay sayers the majority of the medical specialists consider the joint mobile and a common source of mechanical back pain.^{2,3}



Looking at the anatomical picture above one can see how large the ligaments are that support the sacroiliac joint. This is because the amount of stress these ligaments are under to control motion is substantial and the ligament have to be very robust for normal function. Imagine the amount of tension and loads that can support your body weight with bending, stooping, lifting, turning, running, etc. If we are overweight the stress and tension that these ligaments have to endure is even more substantial.

2. **Storage and release of elastic energy:** This is a rather interesting function of the ligaments of the pelvis and sacroiliac joint. This concept was popularized by one of my mentors in orthopedic medicine Thomas Dorman, MD.⁴ As you walk the ligaments of the sacroiliac joint tighten and wind up then relax and assist the pelvis in the swing of your leg while you walk. This is one of the reasons the human bipedal gait is so efficient and requires little energy in the normal individual to walk. In fact in the early history of man it allowed us to be “nomads” and walk for thousands of miles if needed.

Does the Sacroiliac Joint Move?

It is my contention that the SI joint does move. That concept has been an issue of debate even today as ridiculous as that sounds. This question was even addressed by Hippocrates in the first century B.C. He related that the joint is capable of motion during childbirth but otherwise was not mobile. Some orthopedic surgeons still to this day do not believe the SI joint moves other than with childbirth.⁵ In anatomy we have classified this joint as a “diarthrodial joint” which is similar to other joints in your body that move. This was done as early as 1864 by Von Luschka. We began to have a better grasp of the axis of motion of this joint by the turn of the 20th century by Goldthwait and Osgood⁶ in 1905. Since that time most have considered this joint mobile. There are those that have spent a great deal of their lives research activity on the subject of motion of the SI joint.⁷ Nonetheless, the unsubstantiated opinion of a number of clinical experts still view the mobility of the SI joint to be absent in the sacroiliac joints in adults (outside of the pregnant state). They state that if there is motion is present it is immaterial.⁸ Most

clinicians like myself are convinced the joint is mobile and is an important source of back pain.^{9,10} In fact motion of the sacroiliac joints can sometimes be maintained even in advanced age¹¹

It is interesting that so many spine orthopedic surgeons do not recognize the SI joint as a source of back pain when there are other orthopedic surgeons do fusions of the SI joint and surgical instrument companies that make devices designed to pin and fuse the joint because it moves too much!

So now if we start from the premise that the joint moves and is important for walking and function let us take a closer look at the function of these supportive ligaments that stabilize the joint. One of the interesting discussions of the function of these ligaments is the storage and release of elastic energy.¹² What that means is that when your hip moves backward for example when you are walking the motion of the hip puts tension in the pelvic ligaments thus, when your leg swings forward these ligaments spring back and assist the hip in the forward motion. The human gait is quite efficient actually and requires very little energy for walking. When we have reduced integrity of these ligaments we must then use greater muscular effort to walk.¹³ Weakening of the pelvic joint ligaments may lead to fatigue and intolerances for prolonged walking.

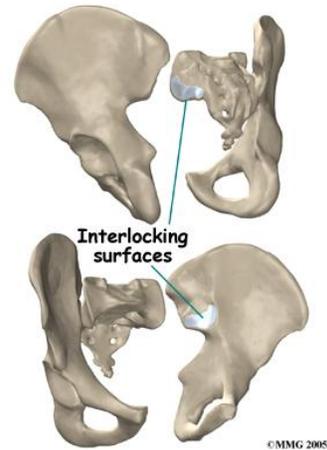
In my opinion and clinical experience the sacroiliac joint moves and is a relatively common source of back pain. The motion of the sacroiliac joint should be very minimal and limited by the supportive ligaments. Because of an individual's anatomical variability there are some individuals more predisposed to greater movement of the joint, mechanical dysfunction and ligamentous instability. Because of the individual anatomical variability between different people the sacroiliac is capable of a number of different biomechanical dysfunctions.¹⁴

If you happen to be a patient suffering with chronic back pain secondary to sacroiliac pain, it is very possible that the surgeon or specialist you are seeing may believe that the sacroiliac joint cannot be a source of pain and overlooked this syndrome as a potential source of your pain. There is an old saying that states "you find what you seek". If you do not believe a condition cannot exist you will not search for it as a possible cause of pain. You can figure out rather quickly whether or not your surgeon does not believe the SI joint can be a potential cause of low back pain. How could you make this determination you ask? Just ask him! That's right, if you ask him he will probably be happy to share his view points on this very quickly for you. Now if you are seeing such an individual that does not mean you have to run out and abandon his or her care. It just means that you will need to be aware of his or her views on the subject and if you feel that the SI joint needs to be taken into consideration in your case then you may have to work with a second physician that can help you sort that out for you. This should be done by someone who is knowledgeable about this subject and knows how to do injections at this joint to block it and determine whether or not it may be contributing to your pain.

Additional anatomic characteristics of the SI joint:

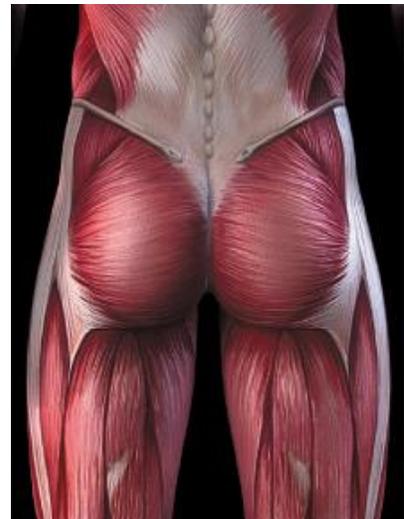
There is some additional information in that we need to cover with regard to the sacroiliac joint before discussing various syndromes of the SI joint and treatment.

When you are born years the articular surfaces of the sacroiliac joint are rather flat. As we age the surface of the sacroiliac joint becomes more curved and interdigitated. As the two articular surfaces of the sacroiliac joint begin to change shape with age it enhances the stability of the joint. In fact as we reach our sixth and seventh decade of life the joint is often fused by fibrous tissue connections and is completely immobile especially in the men. Women have a more relaxed pelvic girdle and sacroiliac joint. The reason that women have more relaxed ligaments and pelvic joints is obviously for the purpose of childbirth. It is also why it is more common that women have chronic SI joint problems than men. We will discuss the changes in the female pelvis during pregnancy in a later section of this chapter.



When the sacroiliac joint surfaces become curved and interdigitated it assists the sacroiliac joint in closing like a clutch when you take a step and bring the weight of your body over your leg. As you step on one leg and the sacroiliac joint closes and the clutch engages the joint is stabilized by both the ligaments as well as the curved surfaces closing together. When you step onto your foot and weight is shifted through the SI joint the joint closes like a clutch. On the opposite side your leg is swinging it disengages as the leg swings. As we walk the sacroiliac joint engages and disengages repeatedly.⁴ We take about 70 million steps a decade in the average person. Because of the individual variability from person to person as previously discussed, sometimes the articular surfaces on one side of the sacroiliac joint of an individual may remain more flat or planar, while the other side is more curved or roughened.¹⁵

This creates an imbalance between the two sides. The more curved or interdigitated side is going to be able to close and “clutch together more efficiently whereas the flatter side will rely more on the ligaments that supports the joint. This in turn will repeatedly place more stress on the ligaments which can break down secondary to fatigue and wear. If this individual is also carrying too much body weight (obesity) the problem is compounded. These individuals begin to experience episodes of re-occurring back pain that are often temporarily relieved with manipulation. This is why they have to keep going back to the chiropractor. These individuals who have sacroiliac instability can in fact, result in a dependency on manipulative therapy and



medications and other forms of care for a lifetime. This does not need to be the case. For most patients with this malady there is a rather simple fix to the problem. We will cover the treatment for this later.

INTRODUCTION TO SACROILIAC DYSFUNCTION:

It is felt by most manual therapist that the sacrum is wedged between the two ilia and the ilia can move slightly in relation to the sacrum as previously discussed.¹⁶ Occasionally the ileum can become fixed on the sacrum or the sacrum can move and become fixed on the ilium.¹⁴ The exact mechanism of how the sacroiliac joint can develop these mysterious dysfunctions is not known. It may be a function of the ligaments failing to restrict the motion of the joint allowing some type of entrapment. It may be a function of muscle imbalance. There may be other mechanisms involved. Whatever the mechanism may be, manual therapists all over the world have been trained to recognize specific signs and symptoms of SI joint dysfunction and use various types of manual therapy to correct these dysfunctions.

There is a significant number of individuals referred to our pain medicine service who have been given the diagnosis of sacroiliac joint pain when in fact after investigation of other condition turn out not to have sacroiliac joint pain at all.¹⁷ The reason for this that typical orthopedic tests designed to evaluate the sacroiliac joint is unreliable. Even palpation over the joint for tenderness is unreliable.^{18,19}

What this means is that you could have pain and tenderness over the sacroiliac joint and also have a few orthopedic examination tests that would suggest sacroiliac dysfunction and pain and it is possible that the pain may not be due to sacroiliac dysfunction at all. Sometimes it looks like an SI problem but is really something quite different. For example a annular tear in the L4-5 disc can refer pain over the SI joint and mimic SI joint pain as described later in this article.

Treatment of sacroiliac dysfunction:

If one has a simple sacroiliac dysfunction that is the source of their problem and the ligaments and supportive structures around the SI joint is relatively normal it is my opinion that manipulation is by far the most effective method of treatment of the condition I have ever encountered. A master of manipulative therapy can often resolve this problem in one or two treatments. I cannot tell you how many times I have seen frustrated patients enter the clinic tired of seeing doctors and therapist and with one or two quick manipulation treatments to the SI joint their pain has either resolved or at least has been substantially reduced.

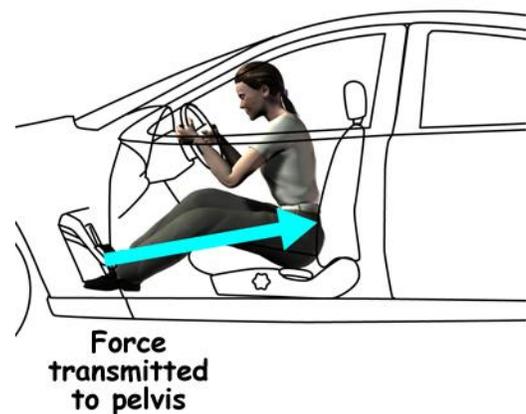
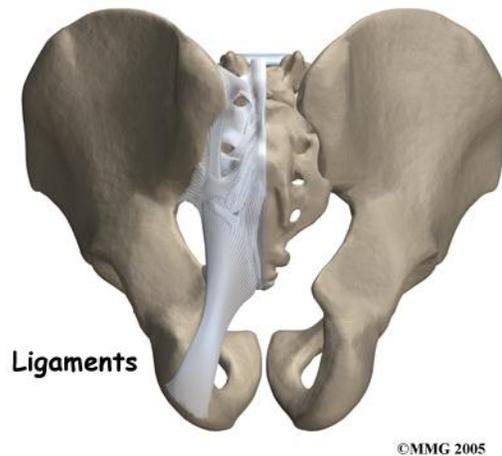
If there has been a presumptive diagnosis of sacroiliac joint dysfunction made by the provider one of the easiest ways to confirm the diagnosis is to have the patient undergo a brief trial of manipulation. A dramatic response to manipulation can often confirm the diagnosis and resolve the problem at the same time. The primary problem with providers that do manipulation is that they fail to recognize other potential sources of back pain that masquerade as a sacroiliac joint problem when in fact the pain is coming from another

structure. It does not take 50 treatments of manual therapy to correct sacroiliac dysfunction. You should know whether or not the provider of manual therapy is going to be able to resolve your problem within a few visits. If you see a provider of manual therapy and he immediately indicates that you are going to require a course of countless visits or provides a schedule of treatments even before the response to such intervention has been monitored, then you are probably in the wrong place. There are many masters of manual therapy and they are really not that hard to find in the chiropractic, osteopathic community. Today it is also not uncommon to find skilled manual therapists in the physical therapy disciplines as well. I am certainly not saying that all manual therapists (chiropractors, physiotherapists and osteopaths) should be able to solve everyone's problem in one to three visits but you should see progress. One can use good judgment as to whether you are on the right course of care or not. Just be aware of being sold a "course of care" that seems too excessive.

SACROILIAC INSTABILITY AND CHRONIC BACK PAIN:

I have prepared you to some degree for this discussion by reviewing some basic mechanics of the sacroiliac joint and important highlights with regard to the anatomical features of the joint itself. As we have discussed previously, the sacroiliac joint is not as supported by muscles as it is by ligaments and connective tissue (called fascia). As we have also discussed the architecture and shape of the joint also contributes to the stability of this important articulation. The ligaments supporting the sacroiliac joint can become damaged or altered in one of two ways. The first way in which they can become damaged is through exposure to cumulative stress or repeated micro-trauma on the ligament tissue over a long period of time. Lifestyle, obesity, multiple pregnancies, gait abnormalities, heredity and individual variations in anatomy and architecture of the joint are just a few things that can contribute to this problem. With the exposure of continued stress on the ligaments and supportive soft tissues these structures undergo relaxation from structural fatigue. The ligaments become incompetent and lose their ability to hold the sacroiliac joint stable while you go through your normal daily activities.

Another way in which one can develop sacroiliac instability is secondary to injury. Traumatic sprain to the supporting ligaments and soft tissue of the sacroiliac can lead to permanent ligamentous instability. A specific injury(s) or traumatic episode(s) can overstress these supportive ligaments and connective tissues and render them incompetent.

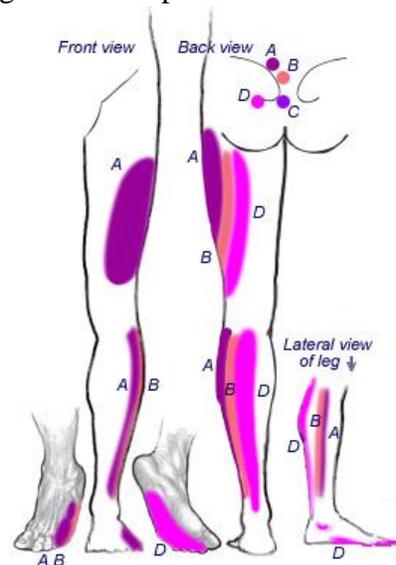


This is especially true if sufficient force or shear stress is applied to the supporting ligaments. This type of injury could occur in a slip and fall onto the buttocks. One can also injure themselves with a stressful lifting episode. Another method of sustaining this type of injury is in motor vehicle accidents. This commonly occurs in head-on motor vehicle collisions where an individual extends their leg out to support themselves on the floorboard of the car just before impact. As an individual attempts to brace themselves during impact with the leg on the floorboard this causes forces to be transmitted through the leg into the pelvis. Since it is more common to brace with the left leg during impact it is therefore more common to see left-sided sacroiliac joint pain after motor vehicle accidents. The sacroiliac ligaments are sheared and sprained and become compromised. It is not uncommon for an individual to have a delay of onset of pain until the next day.

Whether the problem developed over a period of years due to cumulative stress on the pelvic girdle or whether the problem developed out of a specific injury does a matter the results are the same. The individual begins to suffer from chronic mechanical back pain secondary to instability of the sacroiliac joint. The patient with sacroiliac instability will notice several painful phenomena. The first is a low-grade ache that generally persists throughout the day that will vary depending on postural position and activity. They will experience a difficult time remaining in one position for a prolonged period of time.²⁰ They will often have to change positions from standing to sitting to remain comfortable through their workday. Another pain phenomenon that patients with sacroiliac instability will experience is the episodic sharp or stabbing pain that can occur with movement. In addition, the stress of weight-bearing on the incompetent ligaments of the sacroiliac joint causes pain to be referred into the buttocks or lower extremity. This often simulates sciatica and can be misinterpreted as nerve root pain or sciatica caused by a herniated disc. Each of the ligaments in the sacroiliac joint and pelvic girdle have specific known referred pain patterns.

An example of some of the referred pain patterns are depicted in the figure noted to the right. Notice that some of the patterns such as the sacrotuberous ligament (noted in pink) pattern refer directly down the back of the leg. This looks very much like sciatic pain. There are other supportive ligaments of the sacroiliac joint such as the iliolumbar ligament that refers into the groin. It is not uncommon for patients in back pain to have pain that radiates into the groin for this reason.

A patient with sacroiliac instability can be exercise intolerant. A well-intended physical therapist or other healthcare provider providing a patient with an exercise rehabilitation program may find that regardless of the alterations and modifications of the exercise program that may implement, the patient flares and feels worse. This becomes an even more complex problem. In modern orthopedics and rehabilitative medicine therapists and doctors are taught to prescribe movement to exercise universally and often are not trained to know which type of



exercises can be done with sacroiliac instability exists. Implementing exercise in patients with sacroiliac instability requires a sophisticated rehabilitation program. Even then, rehabilitation strategies may fall short if you do not directly target the instability of the joint itself as we will describe in the later section of this article. Specific treatment directed to the SI joint instability will typically result in rapid response and the patient will then gain the exercise tolerance that they have been searching for. Once the instability is corrected the physical rehabilitation program can be successful.

Patients with sacroiliac instability often become "the chiropractic junkie". The reason for this is that the patient with sacroiliac instability often finds significant relief from chiropractic or osteopathic manipulation only to have the pain recur. The patient experiences such a significant degree of relief even though it is temporary, is motivated to return in hopes that it will eventually resolve if they just keep going. I work closely with many chiropractors and osteopathic physicians who recognized this phenomenon and we integrate our care. It is the integration of regenerative medicine injections and manual medicine in combination with rehabilitation that works the best in these patients.

HORMONES AND PREGNANCY IN SACROILIAC INSTABILITY;

Before we address treatment of sacroiliac instability we also need to discuss the effect of hormones on the SI joints. Hormones have a profound effect on the ligaments of the pelvic girdle in the female. An important influence on pelvic girdle laxity is the effect of pregnancy. During pregnancy the corpus callosum which is found in the ovary after the ovum is released, secretes a hormone called relaxin. Relaxin is an amazing chemical. Its job is to relax the ligaments of the pelvis and to dissolve and loosen the pubic symphysis which is the cartilage between your pubic bones. By relaxing the structures its net effect is to loosen the entire pelvic girdle to allow for vaginal delivery of a child during labor.²¹ After pregnancy the effect of relaxin subsides in most females and they regain the stability back to the ligaments of the sacroiliac joints and pelvis. Occasionally the pelvic girdle remains lax resulting in reoccurrence of sacroiliac dysfunction and some of these individuals can develop chronic pain. Multiple pregnancies can occasionally have a permanent effect on the pelvic ligaments.

Another fascinating phenomenon that I have seen in clinical practice is female patients that have no mechanical back pain symptoms whatsoever until the few days before their menses. These patients will experience often rather severe mechanical back pain symptoms for days and generally not for more than a week and then the pain disappears mysteriously. During this period of the menstrual cycle they will describe symptoms of sacroiliac instability. This can be confused as menstrual cramps referring to the back. The auditing about this particular phenomenon is that it is a "mechanical pain" caused by the temporary effect of estrogen on the ligaments.

What effect does the menstrual cycle have to do with these patients back pain? Estrogen has profound effects on collagen and the proteins of ligaments and soft tissues.^{22,23} Estrogen hydrates collagen and softens the proteins. Estrogen slowly rises until it reaches a certain level at the premenstrual period which represents the time when the ligaments become lax and predispose the sacroiliac joint to dysfunction. This would explain why

some individuals have worse mechanical back pain at "that time of the month".

TREATMENT OF SACROILIAC INSTABILITY:

Over the course of 20 years I have employed a myriad of techniques in an attempt to help patients with chronic sacroiliac pain. This has included manipulation, sacroiliac belts (picture to the right) as well as numerous supportive devices, stabilization exercises and proprioceptive training, steroid injections into the sacroiliac joints and ligaments, acupuncture, nutritional remedies, etc. Although many of these modalities can provide transient relief they have not provided a long-term remedy to the pain associated with sacroiliac instability.



Searching for answer to this problem I stumbled onto a method of treatment to have actually been around for many years. Conceptually it seemed to produce the effect I was looking for. It involved the stimulation of connective tissue and collagen growth into the existing matrix of the ligament. The technique would provide a rather “natural” way, if you pardon the expression, to stimulate the bodies of own tissues and ligaments to produce collagen and strengthen the ligaments and connective tissues from within. Do to the fact that this form of therapy causes proliferation of connective tissue and collagen it has been nick-named "Prolotherapy". We provide a comprehensive discussion of reconstructive injection therapy/prolotherapy which can be found on the website. The title of that article is “regenerative injection therapies and pain medicine.” I was initially quite skeptical about this treatment at first. After being invited to interview patients who have had this form of treatment by a well-known orthopedic medicine practitioner in California, I began to realize the profound effect this has on patients. Our institute, wanting better documentation of the effects of this treatment, conducted a retrospective review of patients with chronic pain receiving this treatment. Our results caused us to adapt this form of treatment and begin to use it clinically.

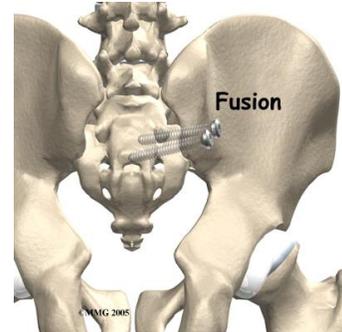
We have now been performing this procedure called "prolotherapy" for well over 25 years. It is not a panacea for all patients with chronic back pain. It requires careful evaluation and specific selection of patients appropriate for this type of treatment. However, that being said, this method of treatment has been profoundly helpful in our treatment of patients with sacroiliac instability. Today we have even more advanced techniques that can be utilized involving biologic, and cellular therapies using platelets and on rare occasion stem cells.

What is prolotherapy?

Prolotherapy is a relatively simple injection technique that stimulates a natural proliferation of connective tissues and collagen within ligaments and tendons to promote healing and increase tensile strength. The basic premise is that the substances injected into affected ligaments or tendons will stimulate local inflammation which triggers

healing, and deposition of new collagen. The new collagen matures and the ligament become stronger. There are several methods that I personally use to stimulate connective tissue healing and induced a collagen proliferation in tissues. I addressed this in much more detail in my article on regenerative injection therapies. There are multiple methods that can be used to stimulate connective tissue perforation. That is described in detail in that article. The important thing for you to know is there is a way to strengthen the ligaments of the sacroiliac joint to improve chronic SI joint instability and pain.

We do not inject corticosteroids into the sacroiliac joint. The reason for this is that steroids cause a disruption of the proteins in the ligaments. Instead we use natural substances to stimulate proliferation of your own tissue and attempt a "regenerative process". Some patients often ask if they can continue to see the chiropractor or osteopathic from manipulation while later undergoing these treatments. I have no problem with my patients seeking chiropractic or osteopathic manipulation so long as the manipulation is not done repeatedly such as 2 or 3 times per week. This frequent manipulation can interfere with my ability to strengthen the joint. The manipulation can be quite helpful however in the initial course of care to maintain alignment and maintain control of pain. I recommend manipulation only on an as-needed basis during the process of tissue reconstruction. The need for manipulation typically occurs more during the early phases of the prolotherapy treatment. Once the tissue is strong enough and joint stability and alignment is maintained the requirements for manipulation are substantially reduced and often times eliminated. The therapeutic goal of our institute is to have you independent of all clinicians and practitioners.



Once stabilization of the joint has been accomplished you can begin to participate in more aggressive stabilization exercise which also contributes to you remaining independent of practitioners. Therefore following prolotherapy or during the course of prolotherapy we may encourage strengthening, conditioning and exercise rehabilitation. We have developed rehabilitation programs that coincide with how course of care and will help you in this regard. More research is needed to support this form of treatment and to develop clinical outcome data. It is my contention that substantial cost savings can be realized by implementing this simple method of treatment in conjunction with early rehabilitation care.

THE PSEUDOSACROILIAC SYNDROME:

In my early career I began to treat patients with SI joint pain that did not respond. I began to discover patients that looked like that had SI pain but did not respond to diagnostic blocks and other injection therapies. Why were these patients not responding? They had pain specifically overlying the sacroiliac joint. They had a clinical history that seemed to be consistent with this diagnosis. They had a number of positive responses during the orthopedic examination that seemed to correlate to a diagnosis of sacroiliac dysfunction and instability. But when attempts were made to stabilize the joint utilizing prolotherapy where we would strengthen the joint a patient would not experience relief of

pain. Why?

The answer was the pain was not coming from the sacroiliac joint but rather was being referred to the sacroiliac joint from another structure. It was rather simple to identify the fact that the pain was coming from somewhere else. I simply began to perform a series of local anesthetic injections in the sacroiliac joint to confirm the diagnosis. Many patients who I was sure was having pain from the sacroiliac joint had no relief when the anesthetic was injected in the joint thereby ruling out the sacroiliac joint as the source of their pain.

So if the pain was not coming from the sacroiliac joint, then what was the source of the pain? I began to perform numerous diagnostic investigations on these patients. It was the discogram that ultimately answered my questions. I discovered that many times patients who had sacroiliac joint pain that had not experienced improvement had pain arising from their disc. In fact, it was typically a tear in the L4-L5 disc that was causing the pain. What was most interesting was the fact the patient had significant localized tenderness over the sacroiliac joint but the SI joint was not the source of her pain. What we learned about this phenomenon is something we have known for a number of years which is that patients with disc pain can have referred pain and tenderness that simulates SI joint problems. To make matters worse is the fact that a patient often has multiple sources of pain and therefore a myriad of referred pain zones and referred tenderness to further confuse the clinical picture.

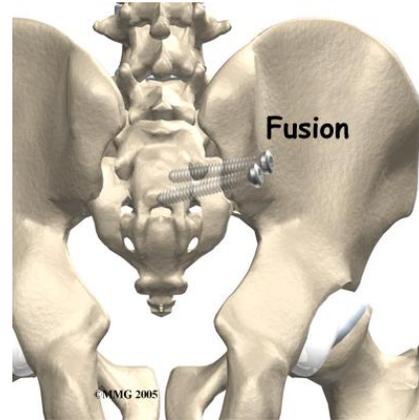
It is not uncommon for me to see an individual with chronic back pain that has a combination of pain from the sacroiliac joint, the facet joints, the iliolumbar ligaments as well as tears in the disc at 1 or more levels. These multiple pain generators make for a complex clinical picture and presentation. Believe me it takes patients, persistence and a strong desire to solve the puzzle to sort out the clinical picture in this situation. It is my contention that it is possible to sort this out. It requires specific and advanced diagnostic maneuvers to do so but it is possible. We believe this is why we obtain the outcome that we do.

Unfortunately, many physicians and health care providers are completely unaware of the pseudosacroiliac syndrome. It represents an area of significant misunderstanding especially with providers performing primarily manual therapy and physical therapy. I predict that such providers will eventually become more sophisticated in this arena and hopefully be able to differentially diagnose and sort out these syndromes early in the case management. I encourage the reader to review our section on discography and the intervertebral disc for further information about discogenic pain.

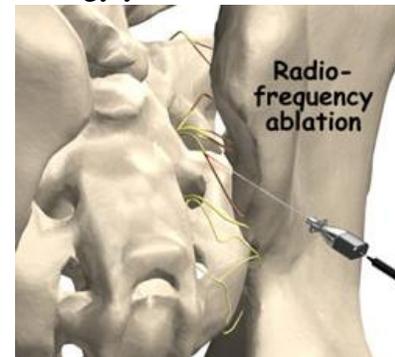
ADDITIONAL TREATMENT PROCEDURES FOR SACROILIAC INSTABILITY AND PAIN:

Additional forms of treatment are being utilized by some specialized orthopedic practitioners spine specialists. I have interviewed a number of patients who have chronic low back pain secondary to sacroiliac instability that failed to respond adequately to prolotherapy. Some orthopedic surgeons have performed surgical fusion of the sacroiliac

joint by two screws being placed through the sacroiliac joint. This procedure can be done percutaneously (by small puncture through the skin and muscle). There are other companies manufacturing small instrument devices that can be placed into the sacroiliac joint to stimulate fusion. Other innovative orthopedic surgeons have been experimenting with fusion graphs placed over the sacroiliac joint and have enjoyed some success with this technique as well.

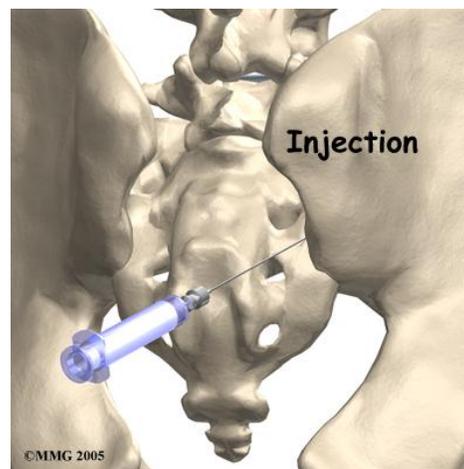


Another technique that is being used by some pain physicians is the use of radiofrequency treatment along the ligaments of the sacroiliac joint. This is done by placing a needle probe into a specific area along the ligament. A radio wave is transmitted from the tip of the needle that stimulates thermal energy your heat. The heat causes a coagulation of the tissue and a killing of any nerves that are in the path of the thermal energy. These practitioners can move this radiofrequency needle up along the lower vertebra to kill the nerves that supply pain to the sacroiliac joint. In addition the heating of the ligaments of the sacroiliac joint also can shrink the collagen protein in the ligament causing it to further strengthen.



The Sacroiliac Block: Diagnostic Blocks of the Sacroiliac Joint

As we have discussed there can be a number of different sources of pain overlying the sacroiliac joint. If one has chronic pain over the sacroiliac region how can one determine if it is caused by a disc or some other cause? The most accurate and most reliable way to determine this is to inject a local anesthetic into the joint or over the sacroiliac joint ligaments. A simple local anesthetic can block the pain and provide profound diagnostic information and confirm the diagnosis. Sometimes it requires sequential blocks performed on the same visit when pain is arising from multiple structures. These local anesthetics and the relief that ensues following the injection of local anesthetics provides a means by which one can sort out pain arising from the sacroiliac joint from the disc, facet joints, and other soft tissues.



Diagnostic blocks performed under ultrasound guidance or under x-ray guidance (fluoroscopy) are common diagnostic techniques that we utilize for this purpose. If one experiences significant relief from these diagnostic injections it can have diagnostic value. Once a specific diagnosis is made a definitive

therapeutic intervention can be developed.

How is a Sacroiliac Block Done?

The sacroiliac block is typically performed under fluoroscopy or x-ray where we can confirm precise needle placement. You are typically placed in a prone position and the local anesthetic is injected over your skin for your comfort. The doctor performing the injection procedure can then guide the needle tip into the joint or targeted ligament and inject local contrast to confirm that when the local anesthetic is injected it will flow into this precise targeted region desired. Following this local anesthetic can be injected and the needle removed. You will then be requested to perform certain functional activities to test for pain relief as well as to fill out a pain diary on an hourly basis typically for 6 hours. This pain diary is critical in the diagnostic process. The value of your early assessment while the local anesthetic is still in effect cannot be overstated. It is my opinion that it is important to reevaluate you immediately following the injection. Many pain specialists make it a habit of performing the procedure and sending you to a surgical recovery room where you are attended to by nursing staff that discharge to home with a pain diary. I make it a habit to functionally evaluate every patient that has undergone a diagnostic block immediately following the procedure as well as to evaluate a pain diary over a designated period of time. Otherwise a patient who has their pain returned the next day may relate that the injections did not help when in fact during the anesthetic phase of the injection he had complete relief. This is a missed opportunity for an accurate diagnosis.

The value of the SI block:

The treatment for sacroiliac instability is often regenerative injection therapies. There are times when we will decide together with the patient to forego diagnostic injections and pursue a "trial" of injection therapy and monitor the patient's response. If however there is any doubt or if it is necessary to precisely sort out the diagnosis first I find apparently the SI joint block to be valuable in being able to do this. It is a method that I use to sort out whether or not we are heading in the right direction clinically. It is important for us to be able to determine whether or not you have a "pseudo-sacroiliac syndrome" with the pain is arising from some other structure. Therefore, periodically I will suggest to patient if we are unsure as to the precise diagnosis to consider fluoroscopy controlled diagnostic sacroiliac injection procedures.

In summary, the sacroiliac joint is a common source of back pain. Occasionally when a patient has been diagnosed with sacroiliac pain they may in fact, have pain arising from other structures which have to be sorted out clinically. At times diagnostic injections are required to precisely sort out the cause of the chronic pain. If sacroiliac instability or pain arising from the sacroiliac joint is the cause of the pain most patients in my clinical experience respond to regenerative injection techniques. My preference is not to perform nerve ablation procedures but rather focused on regenerative procedures while we can repair connective tissues and restore stability which provides a better long-term outcome. There are more advanced procedures that can be used on more rare cases which I have also addressed. I hope you have found this information helpful in our review of chronic pain arising from the sacroiliac joint.

REFERENCES

1. Stuessen B, Selvik G, Udèn A. Movement of the Sacroiliac Joints: A Roentgen Stereophotogrammetric Analysis. *Spine*. 1989;14(2).
2. Bogduk N. The anatomical basis for spinal pain syndromes. *Journal of Manipulative and Physiological Therapeutics* 1995;18(9)::603–605.
3. Bogduk N, McGuirk B. Medical management of acute and chronic low back pain, vol. 13. Amsterdam: Elsevier Science BV; . 2002.
4. Vleeming A, Stoeckart R, Volkers A, Snijders C, eds. *Relation between Form and Function in the Sacro-iliac Joint, Part 2. Vleeming A, Mooney V, Snijders CI, Dorman T (eds.). San Diego, November 1992.*
5. I. D. Diemerbroch I. The Anatomy of Human Bodies. Brewster 1689. London; Translated by W. Salmon. . 1689.
6. Goldthwait J. *Essentials of body mechanics in health and disease*. 4th ed. Philadelphia: JB Lippincott Co; 1945.
7. Weisl H. The relation of movement to structure in the sacro-iliac joint [Ph.D. Thesis]. Manchester, England: University of Manchester,. 1953.
8. Stuessen B, Selvik G, Udèn A. Movement of the Sacroiliac Joints: A Roentgen Stereophotogrammetric Analysis. *Spine* 1989;14(2):162–165.
9. LaCourse M, Moore K, Davis K, Fune M, Dorman T. A report on the asymmetry of iliac inclination: A study comparing normal, laterality and change in a patient population with painful sacro-iliac dysfunction treated with prolotherapy. *J Orthop Med*. 1990;12(3).
10. Dreyfuss P, Michaelsen M, Pauza K, McLarty J, Bogduk N. The value of history and physical examination in diagnosing sacroiliac joint pain. *Spine*. 1996;21:2594–2602.
11. Vleeming A, Van Wingerden J, Dijkstra P, Stoeckart R, Snijders C, Stijnen T. Mobility in the sacroiliac joints in the elderly: A kinematic and radiologic study. . *J Clin Biomechanics*. . August 1992;7(3):170- 176.
12. Dorman T. *Prolotherapy in the lumbar spine and pelvis*. Vol 9. Philadelphia: Hanley & Belfus; 1995.
13. Dorman TA, Cohen RE, Dasig D, Jeng S, Fischer N, DeJong A. Energy Efficiency During Human Walking; Before and After Prolotherapy. *J Orthop Med*. 1995;17:(1):24-26.
14. PE. G. *Principles of manual medicine*. Baltimore: Williams & Wilkins; 1989.
15. Vleeming A, Dorman T. *Prolotherapy in the Lumbar Spine and Pelvis*. Philadelphia Henley & Belfus; 1995.
16. DonTigny R. Mechanics and Treatment of the Sacroiliac Joint. *J Manual & Manipulative Ther*. 1993;1(1):3-12.
17. Potter N, Rothstein J. Intertester Reliability for Selected Clinical Tests of the Sacroiliac Joint. *PHYS THER*. 1985;65:1671-1675.
18. Holmgren U, Kerstin W. Inter-examiner reliability of four static palpation tests used for assessing pelvic dysfunction. *Manual Therapy*. February 2008;13(1):50-56.

19. McGrath C. Palpation of the sacroiliac joint: An anatomical and sensory challenge *International Journal of Osteopathic Medicine*. September 2006;9(3):103-107.
20. Dorman T, Ravin T. *Diagnosis and injection techniques in orthopedic medicine*. Baltimore: Williams & Wilkins; 1991.
21. Kristiansson P, Svärdsudd K, von Schoultz B. Serum relaxin, symphyseal pain, and back pain during pregnancy. *American Journal of Obstetrics & Gynecology*. N 1996;175(5):1342-1347.
22. Wojtys E, Huston L, Lindenfeld T, Hewett T, Greenfield M. Association Between the Menstrual Cycle and Anterior Cruciate Ligament Injuries in Female Athletes. *Am J Sports Med*. September 1998;26:614-619.
23. Park S, Stefanyshyn D, Ramage B, Hart D, Ronsky J. Alterations in Knee Joint Laxity During the Menstrual Cycle in Healthy Women Leads to Increases in Joint Loads During Selected Athletic Movements. *Am J Sports Med June*. June 1 2009;37:1169-1177.