

HONGTAO Thanks for the neuroscience conference giving me the opportunity to come here to share some information that--
MICHAEL GUO: or some cases than we do in the spine center. We do have a spine center now over at Clemmons, a joint appointment with neurosurgery and in neurology.

So what I'm going to talk about today is about the sacroiliac joint and low back pain. That's something actually quite common, but not many people really pay a lot of attention to it. Actually, a few weeks ago, probably two or three weeks ago, there was a story over on CNN, and this doctor from California was talking about SI joint pain.

Actually, it was like, wow, somebody is really paying attention to that. So hopefully, I will provide some information so we'll get something out of there. All right, those are the three things I tried to accomplish today to do something so we can all understand what the SI joint is. Everybody has two, so we should understand it.

And also we try to understand some low back pain is associated with the SI joint. And then we'll talk about how to figure out whether the patient has low back from the SI joint and how we manage that. Just to warn you, my talk is not going to be like the one just so fancy looking, OK? So if this works--

OK, now, I want to start with the concept of pain. Everybody has experienced some pain. When the patient comes to my clinic, you ask them, what do you have? What are the pains like? It's like, what do you mean what's the pain like? It just hurts. OK? It is very hard to describe pain. I understand that.

So actually, it's very hard to make the concept of pain to define pain. So the International Association for the Study of Pain gave out of this definition. "Pain is an unpleasant sensory and emotional"-- and very often we forget this part of the pain. It's the "sensory and emotional experiences associated with actual tissue damage--" that means we can find something wrong-- "or potential tissue damage." That means, we don't know. We don't know what causes the pain. But nevertheless, the patient have the pain.

Or the pain is described by the patient is subjective. Everybody feels pain differently. Even for the same pain, somebody can feel much worse and some not a big deal. OK? So this is the definition of pain. What I try to use this to accomplish is that there are times that we forget about the emotional part of that. There are times we could not find what causes the pain.

Is the patient malingering? Maybe. Should we blow them off? No. And of course, we have a limited knowledge about a certain cause of the pain. So we cannot blow the patient off. We should always treat them seriously. Of course, we have other ways to find if somebody is malingering. All right?

So the next one, you probably have seen this cartoon, and what I'm going to talk about a little bit information about low back pain. By definition, the low back pain is anywhere from the lower margin of the rib cage all the way to the gluteal folds. Therefore, the pain covers the conventional low back. Your sacral pain, very often the patient will say their hip pain and also covers your buttocks.

So it is quite an area to cover. So when we talk about low back pain, we need to figure out what is really going on. So that's that. Now, on the low back pain, think about that. Let me ask you, in this room, anybody never had a low back pain, please raise your hand. OK, so low back pain is pretty much everybody has it.

So the lifetime prevalence is about-- I'm more believing 90% instead of 60%. Now we are saying, why not 100%? Maybe some kid died before he can express or feel low back pain, right? We have pediatric patients die before they can really tell us they have low back pain. So I believe about 90% or so that's more than.

Low back pain is a very, very common thing. It's number two, secondary to respiratory problems in the doctor's office. And it also involved a lot of workers. We have a lot of nurses here. I recognize their faces. You guys work very hard. Actually, that is a risk factor for low back pain, because we take care of the patients. Sometimes we lifted them and sometimes lift them in a very awkward position.

So that will cause low back pain, too. All right? And you can tell about 2% of the workers in the United States claimed their disability from low back pain. And the causes of that is tremendous. Nobody knows exactly how much it costs. Now, I put a number here as \$100 billion, because this is the estimate from one of my mentors.

OK? Now, if you read the literature, it is anywhere between \$2 billion to \$237 billion. This was in the literature I read through. So either way, it's a huge cost. Not only that, it causes a lot of emotional, psychosocial issues too. So in the spine center, we see a lot of low back pain. And the reason I want to talk about this today is so we can pay attention to the low back pain, not only to our patients, also to ourselves.

OK, now, I'm going to talk about the sacroiliac joint and low back pain. So we're going to just to do a quick review of the sacroiliac joint. It is a true joint. It is a diarthro, di, or synovial. Either way, you can say either way is a joint between the sacrum and the ilium. It is the only two joints that connects our upper body and the lower extremities. Therefore, we use it very often. I always tease with our patients that when we start to kick and cry after our mother, I should say, gave birth to us.

So we started to use those two joints. All right, so you can tell we abuse them every day, the ilium when we're in bed. So the joint is a very stable joint. There are a lot of joints to stabilize this joint. And there are a lot of muscles around this joint. A peculiar part of the joint is that the anterior and inferior one third of the joint is a true joint. It has a lot of synovial fluid there. The rest of the joints are, really, we could-- the term is syndesmotic. It means a lot of ligaments, then the joint itself.

This is the SI joint. All right, yeah, all of the structures in our body are going to have some sort of innervation. Now the SI joint non-special. Unfortunately, we do not know the innervation of the SI joint very well. It's very controversial. And you can tell the number of levels involved from L3 to S4, it depends on the study. It depends on the cadaver study. The anatomy study there is different.

Generally, we believe that is more of-- let me see if this-- do we have a pointer here? The other one, OK, this one here. OK. So this is an L5 dorsal ramus here. Generally, we believe that the this is the sacral side of the SI joint. We believe more start from here in the S1, S2, S3. And some people even think S4 has something to do with-- play some roles in the SI joint there.

And other than the nerves, of course, we don't know. Do we only have the dorsal rami to innervate the SI joint? Or do we have a ventral or the front part of the spine to innervate that is really not clear. So people are still arguing like that. They will get serious about that. Other than those nerves then, we also have those mechanoreceptors and nociceptors that not only sense what is going, also tell the CNS system, you know, how the SI joint is doing, the state of the SI joint. All right?

So now, the SI joint, as I said, is the only two joints connect our trunk and the lower extremities. Therefore, a lot of loads have been transferred through the SI joints. And this is so-called the keystone structure. And it showed that you can tell the load goes through the keystone structure and transfer to the hip bones or the coxal bones.

And looking at the picture looks like a pretty picture. In fact, those two joints go through tremendous load and torques through the day through everything we do. Different postures have different load at different torques to the SI joints. Therefore, very often, it causes the injuries there. As I said here, any small changes in the joint alignment are going to cause tremendous change of the force there and can potentially cause the injuries there, therefore low back pain.

All right, now, a little bit more of SI joint pain. SI joint pain is a very stable joint, as I mentioned earlier, but we have to move, right? We're going to bend over. We're going to extend. We're going to lean laterally to the side. Now, everything involved the joint. If the joints are totally fixed, everything we do is going to be more different, it will cause more trouble to the other part of the spine or lower extremity of the hip joints.

Therefore, the joints are going to have some sort of rotation. If this is the tail bone, if this is the sacrum, this is the ilium so the joint can rotate about 60 degrees. The joint also can rotate this way a little bit. All right? So therefore, you can go through. You can look at that as a tilt, the rotation, and lateral shift a little bit.

But there are muscles that we want to be sure, because we have a lot of important things around the pelvis. We don't want the SI joint to be dislocated. Therefore, their abdominal muscles, pelvic muscles, try to hold the joint there steady in addition to the ligaments. So that's a very important part of that.

Now, the change by the SI joint when we were very, very young. Some of you guys are still very young there. And the joint as a mobile absorbs a lot of things. Therefore, we can jump off two-story buildings without problems. Now, if I jump two steps, I'm going to hurt, right? So that's the change through the life.

Now, we're going to have that. But normal aging, you're going to have some arthritic change. Your ligament will get less loose, less strong through our aging process. But no matter what, most people believe that the SI joints do not fuse, whether we are from the monkey or from God, it depends on what you believe. And the SI joint is so important as a pivotal joint, you should not fuse.

But some doctors think that the SI joint eventually will fuse, but I disagree with that concept. And through the aging process, the biomechanics change. That's why you don't see the youngsters get SI joint pain very often unless you're an athlete. Or, actually, this week, I just saw a little girl 18 years old. She's on the Wake Forest Dancing Team, the Athletic Dance Team.

She has SI joint pain. Otherwise, most patients around 40s or so, or above, and sometimes you have some 30-year-old when they do something they're not supposed to do. So that is the biomechanical change then through the aging process.

All right, the muscles, and as I said, the muscles around the SI joints, the ligaments to stabilize the SI joints. But at times, the muscle will, of course, we're going to have to bend over, extend our spine, rotation, those kind of things. Those muscle will do things. And there is no single muscles really directly to work with SI joints, more for the muscles around the pelvis to change the dynamics, the positions, of the pelvis therefore involve the SI joint movements.

Now, the imbalance of some muscles-- I have some examples then. In the front part of the pelvis, we have this psoas muscle and the iliacus muscle. And those muscles are from your spine, from your pelvis, attached to the inside part of your hip bone called lesser trochanter. Now, if those muscles has an imbalance and cause the pelvis tilted, or tilted laterally, or tilted anteriorly, that can cause a lot of torque to the SI joints.

Now, in the back part of the pelvis, we have the gluteal muscles. The maximus and the medius muscles are the major ones. Really, if we mess those things up, it will cause a lot of problems. For example, the medius muscle is really the one to hold our pelvis. Right? When I lifted this leg, the reason I'm not dropping this way is because my gluteus medius is trying like crazy to hold my pelvis, trying to balance it. If the patients have some nerve injuries or muscle problems, and their pelvis cannot hold very steady, it will cause a lot of SI joint problems.

All right, let's talk about the SI joint pain. SI joint pain is quite common. In my clinic, I see about 30% of patients that have SI joint pain. Now, the range there is a 10% to 30%. In the primary care physician's office, you see all kind of a low back pain, maybe the percentages are lower. For example, a lot of patients probably have the muscle strain causing low back pain. Because we are in the spine center, we get more for the specialized patient to us, the patient with special problems.

So we see a higher percentage of that. Unfortunately, not many doctors really recognize this SI joint pain. That's why the story in the CNN-- because that's one of the low back pain very often got a misdiagnosis, or under-diagnosis, or mistreated. All right? As I said under-diagnosis, under-treated, and misdiagnosed, and mistreated.

Let me give you an example of a patient referred to me from a spine surgeon. Of course, it's not our spine surgeon, right? And this lady is a 67-year-old lady referred to me with an MRI showed left-sided L2, L3, disc herniation near the neural foramen. Of course, that would affect the nerves that you would think the patient would have a pain in the groin area, which she had.

When she came to me, she was referred to me for the epidural injection. But when I talked to her, she said, well, I have a pain in the groin. But I also have the pain in my hip. What she means is really her sacral pain on the left side. When I did the examination, I suspect that she had SI joint pain.

So I talked to her out of the epidural injection and said, let's do the SI joint diagnostic block to see if that will make a difference. If I was wrong, then we would just delay your treatment for a week or so. And if I'm right, and we treated the right thing, then hopefully, we'll get rid of the pain or improve your pain. And she agreed with me.

So we did a left SI joint diagnostic block. She came back and said, that afternoon she was like she was 18. So that tells us we got the SI joint pain. So I treated her with the two SI joint steroid injection, and her pain is gone. Am I then lucky all the time? No. OK? But I was lucky. That's why I'm telling the story. All right?

So that tells you, let's say, then a surgeon sent her to me and wanted to see if the epidural injection does not help her, then we will proceed to the surgery. With her case, if I did an epidural injection, she's going to continue to have the pain. And she probably will have the surgery.

So that showed how great I am, right? Now, I was just lucky in that case. I'm just telling you an example then of there are some misdiagnosis here. So I'm just joking then. Of course, it's under-diagnosed. You're going to see why. We're going to talk more than you can find out some more for under-diagnosis that-- OK.

All right, so what caused the pelvic pain, I'm sorry, the SI joint pain? Everybody here probably had an episode or so. In fact, myself is a SI joint pain victim, mine is from the poor golf swing. So I have the left SI joint pain. I get an SI joint injection, so far, only two injections, and I'm doing well. The last injection was about a year ago.

So it was treatable low back pain. Now, very often the low joint pain is caused by-- we carry something heavy, whether it's a box of frozen chicken wings, or our children, or our patients, you load your pelvis, and you rotate your pelvis. That will put a lot of torque to your SI joints.

In fact, I treated two VIP patients, our VIP patients. And both of them bend over in the morning to pick up the socks from the floor. They both had SI joint pain. So remember, when your wife told you, don't throw the socks on the floor? Listen to her. OK? Of course, the ladies never threw the socks on the floor, right?

So that is one of the causes of SI joint pain. I see a lot of that from work, from some nurses, for example, restaurant workers, things like that. The other thing, of course, is degeneration. There's not much we can do. Everybody goes through that process-- trauma, car wrecks, sports injuries. And because of that, I've treated quite a number of you Wake Forest athletes and more from the volleyball teams, because they throw themselves to the floor, dig the ball up, and then cause trouble with that.

And surgery, again, surgeons cause trouble. Right? OK, now, it's not what the cause of trouble. There are patients if they have, say, severe degenerative spine disease. What do we do? Our neurosurgeons have to help them, fuse their spine, take the disc out, their pain feel better, right? A few months later, they start having the so-called hip pain.

When you look at that, they start to have the SI joint pain. Why? Especially with this infusion, you know, your lumbar spine is a very flexible part of the spine, especially the lower part of that. If the surgeon has to fuse that part of the spine to solve the problem there, they have to do that. They have no choice. When you fuse that part of spine, where is the force going to? Go to your SI joint.

That's the way it is. And nobody can reverse that thing. OK? That's one thing, joint replacement. Now, whether you have a knee replacement or a hip replacement sometimes can cause the SI joint pain, not directly from the surgery, but from the biomechanical changes there. I did see one patient who is an 18-wheeler driver. He had an accident with another 18-wheeler near Atlanta.

And he broke his hip. When I look at his hip, the so-called new hip, the replacement hip, it's almost 1 inch longer than his regular leg. That's unfortunate. And what happened? I don't know. But that causes the SI joint pain. The patient asked me, how? I just had a hip replacement. My pain is gone. Why did I start having the back pain there?

I told him because he is a driver. I told him, if you put a spare tire on one side, a monster tire on the other side, your car is going to scream after a few months. Right? The frame is going to be shifted in a way they're going to have a back pain. That's what it is. That's our back that is going to occur, that kind of thing, right?

Rheumatological disorders, and that's unfortunate. That's the inflammatory DTs, especially if there was a condition called ankylosing spondylitis. You have a bamboo spine. That is similar to the spine fusion there. It's similar to that. Basically, your rheumatoid arthritis fuses your spine. You have to have the torque change-- the force change to the SI joint and cause more trouble. OK?

And if you search the literature, any literature associate with the ankylosing spondylitis, the SI joint is involved. Nobody's spared from that. Pregnancy, that causes the SI joint pain. Not everybody has it, but I have seen enough. And the weight gain and the change to lordosis all causes a lot of problems.

And also, then you have to loosen your ligaments around the pelvis to accommodate the fetus, right? The change to loosen the ligament that tied it up, that process sometimes doesn't go perfectly. That can cause trouble. Usually those patients are easier to treat. All right? And hypomobility is around your SI joints. Somebody's ligaments are looser. Somebody's ligaments are tighter.

The funny thing is I found that runners have more tight ligaments there I guess because they constantly run there the body responds to have to tighten up. If it's too tight enough, it can cause SI joint pain. So stop running. Don't listen to me.

So repairs due to torsional forces to the low back SI joint can cause trouble too. And some workers there on an assembly line, you have to do like Lucy. You have to turn it back and forth. And that can cause trouble, right? So I love Lucy too.

All right, now, what kind of presentation are you going to have when you have the SI joint pain? Now, most times, the patient going to have a pain just in the lower part of their sacral region and patients say just above my buttocks, below my waist line. That's the majority of them. But it's sometimes like the 67-year-old lady came to me for the epidural injection.

She had a left groin pain. That is one part of the SI joint pain very often you see. That is the referred pain. It's not a radicular pain. If her disc would cause the pinch of the nerve or radiculopathy, then she would have a radicular pain. But what she had there was a referred pain.

Now, also the thigh pains is referred pain to-- is more along the posterior thigh. But I have seen patients complain of anterior intermedial thigh pain. They have that, too. So rarely, rarely some patient will have SI joint pain, the referred pain, down to below the knees. A study shows about 14% of those patients. And I don't see that very often.

And also, if you would see those patients with a pain below the knee, you want to freak out whether they truly have a radiculopathy or not. You want to rule that out. So I think I have some cartoons here just to show you here. This is the iliac crest. This is your posterior superior iliac spine. And this is about your SI joint here.

Most patients will have the pain around this area just locally. And sometimes, the pain may go down to the part of the buttocks-- this is the gluteal fold. And sometimes, the pain may even go down more. This picture does not represent all of the pain that we may have. I see more patients going down to the posterior thighs like in this picture. All right?

Sometimes they have the pain along the SI joint, and they have some pain along the spine. That is a possibility. Now, this picture to show you that if the patient has a pain around the SI joint or the Posterior Superior Iliac Spine, or PSIS, and with some pain along the posterior thigh that is more likely an SI joint. Of course, it's not 100%.

But if the patient tells you, my pain is more in the middle of my spine, kind of just below my waistline or along the waistline, then I have a pain going down the back or the side of my leg go to my ankle or the top or bottom of the foot. That is probably more of a disc problem and called so-called pinched nerve or radiculopathy. So I hope the cartoon will give us a clearer picture to see about the SI joint.

All right, is low back pain only caused by SI joint pain? No, it's not. And here, the differential diagnosis, there are some other things. And the SI joint, if you are familiar with the anatomy SI joint and the L5 disc are very close. They are very close then. When you have SI joint pain, the disc is sometimes harder to identify and lumbar radiculopathy of the so-called pinched nerve.

And the lumbar facet joint pain-- that we have two sets of small joints at the back of our spine called a faceted joint. And if you have that pain, you can have a referred pain down your buttocks, your sacral area, your thighs. So that's something we have a different physical examination to identify that.

Piriformis syndrome, there is some small muscle that crosses from the anterior part of the sacrum, across the sciatic notch, attached to the greater trochanter. That is the piriformis muscle, a very small muscle. But it sometimes can cause trouble because of the sciatic nerve runs just inferior to the piriformis muscle.

If we have some injury to the muscle that can cause the irritation of a sciatic nerve causes symptoms similar to a radiculopathy. A sacral fracture, of course, then to cause the pain over there. Spondylolisthesis, that is when we have the parts defect. And the patient's vertebrae or spine bone slipped backward or forward. That can cause a pain there. And the proximity to the SI joint may feel like it's SI joint pain.

Spinal stenosis is capable of causing the radicular symptoms through the buttocks, through the thighs, and of course, legs to the foot. That can, of course, do that. Hip joint pain, if you look at that, I have a skeleton in my clinic called George. And I use that to teach our patients, to educate them, to show them where the pain is from and what we are going to do. It works quite a while.

So I was joking that George and I have separation anxiety. And Dr. O'Gara very often takes George away from us. So we have an Amber Alert at times.

So your hip joint is very close to your SI joint. Sometimes, if you have the hip joint pain, you can have referred pain toward your SI joint that you may feel. The patient may have an SI joint. But of course, through the history and physical examination, we're going to figure out what is going on there.

So of course, the infection always causes the back pain problem. Now, when we evaluated the patient, especially for the SI joint, the history is the most important part. Basically, it is the clinical diagnosis. OK? And when I see the low back pain patient, I pay much attention to the history. Now, I have two trainees here with me that they can tell you, I don't take that easy on the history part.

I really want all the true history about that-- how the pain started. Did you have a fall? Where did you land onto it? If you had a car wreck, is it head on? Is it rear-ended? Is it a t-bone from the driver's side or from the passenger side? All those kind of different impacts are going to cause a different kind of problem. So the onset part of history is very important.

Of course, the location, always ask a patient to point to me where they feel the most pain, where they feel other pain, and the location, and the pattern, the referral pattern or radicular pattern we want to know and what the pain feels like. Does it feel like more of an achey kind of sharp pain?

Or is it more of like a burning toothache kind of pain? That will identify whether we have the joint pain, we have the inflammatory pain, or if we have a neuropathic pain. That is very important for us to figure out whether the patient has true radicular symptoms or is it from the SI joint?

All right, the aggravating factors, what kind of things do you do to make the pain worse. And the two VIPs that bend over to pick up the socks in the morning, when I walked in the room, they both were standing in the room and the other ones are pacing back and forth. Now, if the patient sat down, they would have feel a lot more pain then if they stand or keep moving, because if you sit down, all the load is just directly to the SI joints.

The SI joints do not get a relief from that. So moving around actually helps more. All right? Or the patients say, if I stand there long, or if I sit there long, if I drive for a couple hours, the pain is getting worse.

So those are good indications that the patient probably have SI joint pain or when they climb stairs of some other things. All right? What kind of things are making it better with your SI joint pain. Very often, heat or ice helps more moving around. Say, I drive in two hours. I have to stop and all walk to the bathroom, came back, the pain is a lot better. I get back on the road again. So those kinds of information we want to know instead of if you would have a pinched nerve, just walking around probably wouldn't make it better. Most likely, it will make it worse. All right? So those are the informations that-- what kind of symptoms do we have?

This is for me to get information to identify whether the patient has SI joint pain or they have the so-called pinched nerve is that if the patient comes to me saying, I have a burning numbing sensation going down my leg, OK, it feels like hot water running down there, that probably is more of a pinched nerve than just the SI joint, just to give you an example.

The previous treatments also tell us. I treated a 73-year-old gentleman from Greensboro. And unfortunately, when he came to me, he was already treated there for three years with the epidural injections pretty much every month. When he came to me, his face was round. He had a hunched back. He probably had Cushing's syndrome just from excessive steroidal injection.

When I talked to him, actually, he said those injections didn't help me, but my doctor wanted to continue that. So when I examined him, he's a city bus driver. And he said of course by the time he came to me, he couldn't work anymore. He said just driving the bus just kills him. So when I examined him, it feels like he has as SI joint pain.

So I did a diagnostic block, and I did a few injections. And his pain was much better. Again, I'm great. OK? So those kind of treatments would tell us if that gentleman would have a pinched nerve, for example, he probably would respond to the steroids, the injections, somewhat all right, if it really didn't help and that his previous doctor would have sent him to a surgeon, for example. So those previous treatments are important for us to do that.

Now, the other part of the imaging, of course, we are in neuroscience, and neurosurgery, neurology, imaging is very important to us. Unfortunately with the SI joint, imaging does not correlate with symptoms very well. You may get the SI joint x-ray, look that the osteoarthritis is pretty bad. The patient may not have symptoms.

When you look that you have a beautiful joint, but they may have pain. You don't have to have the osteoarthritis in your SI joint to cause the pain. Remember, we are talking about the ligaments and the muscles around the SI joints, the mechanoreceptors, the nociceptors, they can have trouble too and cause SI joint pain.

So, usually, I do not order the x-ray or MRI when somebody has SI joint pain. Now, physical examination is important. But unfortunately, there is a limited thing we can use to figure out whether this is a SI joint or not. As said, the SI joint is more of a clinical diagnosis based on my experiences.

But there are things you can find. A patient is going to have some tenderness around the PSIS or around the sulcus of the SI joint. Or if you don't have a tenderness, but you put your finger there, say, you have the pain there, but much deeper there. I don't feel the tenderness, but my pain is deeper down there. So that tells you it's SI joint issues.

Sometimes, the patient has a tenderness in the SI joint area with the range of motion. And I have found sometimes the patients had flexion makes it worse. Sometimes extension makes it worse. Therefore, it really does not have a lot of value for us to use due to figuring out the patients to SI joint pain.

The provocative tests, there are multiple of that. In the handout, I have listed several. There is a table I borrowed that you can tell there are many, many provocative tests. Are those tests very good? Very sensitive? Not really. They are more specific, but not very sensitive. So I don't usually do much. I usually do the FABER test or the Patrick's test is a Flexion, Abduction, and External Rotation. We do that test. And leg length discrepancy is important. Gait is important.

Why is gait important sometimes? Some patients may have a congenital leg length discrepancies. Somebody may have had a stroke. When you had a stroke, you have a different kind of gait. You know, just like the car that the wheels started to get a different kind of tires on that. The frame of the cars are going to change. So gait is very important. I do evaluate the patient's gait. Usually, I don't ask them to walk for me, because if I ask anybody in the room to walk for me, everybody tried to walk like a model, right?

So sometimes, or if I have a deficiency of my gait, I probably try to cover that subconsciously. So your gait tends to go normal. So usually, I just watched them when they walk out of the clinic. And some malingering patient, I can see that too. Their gaits change totally, completely, right? But that's a different issue. So those are the things I do pay attention to that.

All right, here is the table when I mentioned that there are a different kind of tests you can read through that you can pick and choose. Really, really, you don't need to go through all of the examinations there? OK, here's some links that I think we have a limited time. When you go back there, you can go online and check. And you can google any of those tests. You can do that.

All those tests basically to put a stress to the SI joint so that you can see if there is a tenderness or not. So let's go to the next slide. All right, so the evaluation of the SI joint, as I said, more of a clinical diagnosis. And those physical examinations has a positive predictive value of about 60%. Some people say it's much lower than that. I do believe it's a lower than that just through the physical examination.

But that's the study they put out there. And the Patrick's test or the FABER test, the palpation to the tenderness, those are the ones that will provide some information. Be careful with that, and we use those tests. Some of my trainees say, I don't think he or she has SI joint pain, because the FABER test is negative. If you remember, if the negative FABER test does not exclude the diagnosis of an SI joint.

All right? The gold standard diagnosis is, of course, they inject a local anesthetic to the joint, which will relieve the patient's for a few hours. That is what I would normally do.

OK, the treatment, usually when the patient comes to us, they have already gone through those conservative treatments. So for the primary care physicians here or the nurse practitioners, if you see those patients has started those conservative treatments, rest is a good one. But make sure you don't put them to bed rest, because the new concept is that when the patients have low back pain, you don't put them to bed rest.

You want to move around. You can do a cold or warm compresses. And we can treat them with NSAIDs if the patient does not have a GI or kidney problems. Opioids can be used if you really, really have a bad pain like the two VIPs. Honestly, if I were their PCPs, I would give them a little bit something like Vicodin, because they were hurting, especially acute ones really.

Physical therapy, that is more dependent on the patient's immobility-- hypermobility and hypomobility. Then they have different maneuvers accordingly. The maneuvers or chiropractors cognitive behavior treatment is important. And I didn't mention earlier that part of the pain get to the other part of the brain, especially the frontal part of your brain.

And that part of the pain injections or medication wouldn't help. So we do have a pain psychologist, Dr. Feldman, over at comp rehab. And they can be helpful. Yes, they can be helpful, really. Pelvic belt is the belt that some patient than have, really, usually I see more senior citizens use that when they have medications or injections still cannot take away the pain. And when they use those belt, it really wraps around their pelvis called a pelvic belt or trochanteric belt.

That more stabilized their pelvis, but I only recommend to use that when they move around. They cannot wear them all the time. That will make your muscle weaker around your pelvis, which is not good. Intervention is the stuff we do in the spine center. It is the intra-articular steroid injection. I highlighted that under fluoroscopy.

You can check with my trainees. Even under fluoroscopy under C-arm, sometimes it's not easy to get to the joint, because the joint is a really narrow joint. So when you do blind injection, can you get to the joint? Yeah, once in a while somebody wins the lottery anyway, right? So I'm just joking. I'm not saying you cannot do the blind injections.

That is still widely practiced there. When I was in residency with a physical medicine rehab, I did an injection. But I really don't have confidence to do that anymore. Some patient may have a periarticular issues like a ligament inflammation, sprained ligaments there. Yeah, that will help. So really kind of judge that before you treat and do the blind injection.

The other kind of injection that we don't do here is the prolotherapy and when you inject a hypertonic solution around the joint, causing local inflammation to strengthen the ligaments. They are very limited study. I only saw two or three studies then done by the people doing those injections. Of course, they said it works.

When I survey around my friends when I meet them in the national convention, most of us don't do that. Radiofrequency ablation is a newer study, a newer treatment, for the SI joint pain. Let me show you if I have a picture here. OK, here's the SI joint injection. This is the needle. This is the SI joint.

And you have to look at it. Because of the pelvis, the ilium goes in this direction. So you have oblique, the C-arm look into the joint. This is an injection that uses a contrast. I don't usually use it. So this is a contrast. I have a reason to put the effusion patient here, the hip replacement patient here, is because those are the possible causes of that. As I mentioned that, when you fuse the sacrum with the lumbar spine, the torque to the SI joint is tremendous. All right?

So this is a one. The next one is, OK, this is the study, part of the cut out. So I'm going to get to that radiofrequency ablation first. The study shows that you have various studies at different years, a different number of patients there. They found that SI joint injection it works in the short term and long term, this study shows.

This one said, you know, it works for the short term, and the longer term also then. This one is elective short term and elective long term. OK, there was one. I cut it out. But most studies shows that intra-articular injection with a steroid works. And over the years, I have seen that it works. The patient may have to come back to a repeat injection, but not very frequently.

The next cartoon is the RF ablation. Let's see if we can get it. OK, this is RF ablation. We talked about it earlier that the innervation of the SI joint is controversial, right? If we don't know where the nerve is, how do we do it? That's what they do. I said that's what they do it is that they pretty much kill everything along the SI joint. All right?

The reason that I haven't done that yet is because I don't have as much faith. Do I do RF ablations? Yes, I do. I do the neck, your thoracic spine, and lumbar spine. But for the SI joint, I have not done that yet. I'm just waiting for a more objective study to come out, OK? Because a lot of those studies here, I am reading this for you now. This study-- different study, different number of patients, a positive for short term and long term. This study shows it works. All right?

This study says a positive short term, short term, yes, good. It works, but long term, it doesn't, which it does not make sense to me, because when you ablate the nerves, it will take the nerve quite a while to come back. OK? So that's why I have some question about that. This study shows it doesn't work. This study shows it works for both short and long term. This works both short term and long term.

So there's a possible treatment options out there. I'm quite conservative what I do in terms of medicine. All right? So I think that's all about it when talking-- hopefully, I didn't go over the time. OK, I'm going to do the-- just summarize the thing. The SI joint is a very important joint, and it connects our trunk and the lower extremities.

And we abuse it a lot, a lot of changes there. Any small misalignment that could cause big trouble and then cause low back pain. And it's very often under-diagnosed or misdiagnosed so when we treated those and see those patients, we have to be careful with that and make sure we got the correct of that. And a good history will help us a lot. There are some physical examinations. And of course, there are different choices of treatments there. So that's what I have this afternoon, and I would be happy to answer some questions.