

Sacroiliac Pain and the Long Posterior Sacroiliac Ligament

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Sacroiliac pain has multifactorial causes, and the long posterior sacroiliac ligament (LPSL) may be a significant factor. The LPSL is the most superficially located sacroiliac joint (SIJ) ligament, is easily palpated and has been associated with sacroiliac/back pain. This ligament is directly caudal to the posterior superior iliac spine (PSIS) and connects the PSIS (and a small part of the iliac crest) with the lateral crest of the third and fourth segment of the sacrum.¹ Tenderness of the ligament is often found just below the PSIS. Both men and women are often found to be tender in these areas, particularly women experiencing peripartum pelvic pain.

In a study on peripartum pelvic pain, involvement of this ligament was useful in differentiating between mainly lumbar and pelvic complaints.² A histological study of the relations of this ligament showed the middle of the ligament as a confluence of three layers: the erector spinae aponeurosis, the deep fascial layer and the gluteal aponeurosis. It was noted that in the deep fascial layer lateral branches of the dorsal sacral rami were identified.³ The authors state that sacroiliac joint pain may be due to an entrapment neuropathy of the lateral branches of the dorsal sacral rami at the long posterior sacroiliac ligament. The fascia of the gluteus maximus muscle also covers the ligament.

A study was conducted utilizing sensory stimulation-guided sacroiliac joint radiofrequency neurotomy on these sacral lateral branches in a group of 14 patients with pain in the sacroiliac area. Sixty-four percent of the patients experienced relief, with 36 percent experiencing complete relief. Fourteen percent experienced no improvement, but none of the patients was made worse.⁴

To understand just how increased tension in the LPSL may be related to pain, it is necessary to understand the function of the long ligament and its association with the sacrotuberous ligament. The sacrotuberous ligament (STL) restricts sacral nutation while the LPSL restricts sacral counternutation. Sacral nutation increases in load-bearing situations such as standing and sitting. Nutation also occurs when lying prone compared to lying supine.^{5,6} Although the above ligaments have opposite functions, there is some increased tension in the LPSL when the sacrotuberous ligament is loaded. This may be explained by some connections between the two ligaments.

It gets somewhat complicated when you include all the connections associated with the STL and the LPSL. Both ligaments are affected by muscular connections. Traction to the biceps femoris greatly increases tension to the STL, with hardly any influence on the LPSL. Shortening of the biceps femoris has been shown to limit sacral nutation by way of the STL relating short hamstrings to lower back pain.⁷ Traction on the thoracolumbar fascia in the direction of the latissimus dorsi muscle causes sacral nutation and slackens the LPSL. Therefore, it appears that increased tension in the thoracolumbar fascia or fascia latae (overlying the biceps femoris) will have the effect of exerting

tension on these ligaments.

The gluteus maximus muscle can cause slacking of the LPSL when contracting.¹ Manipulation of the iliac bones most probably creates nutation and counternutation of the sacrum, and may affect the tension of the above ligaments. The multifidus and the erector spinae contribute to nutation, and these muscles should help slacken the LPSL. Counternutation usually occurs in unloaded supine positions. Counternutation in the supine position can change to nutation by maximally flexing the hips and using the legs as levers to posteriorly rotate the iliac bones relative to the sacrum. This occurs in the labor position, creating space for the head of the baby during delivery.⁸

To conclude, the LPSL is tensed when the SI joints are counternutated and slacked when nutated. Both the erector spinae and STL can counterbalance the slackening of the LPSL. Pain localized to the LPSL area could therefore indicate sustained counternutation of the SIJ. It is thought that a positive active straight-leg-raise test might indicate a counternutated SIJ.⁹

Counternutation occurs when the lumbar spine is normally flattened, which occurs late in pregnancy as women counterbalance the weight of the fetus.⁷ If this posture is creating pain, there may be excessive tenderness just inferior to the PSIS. It seems like a good idea to palpate just below the PSIS for localized tenderness on patients with localized sacroiliac pain.

Years ago, I attended a seminar conducted by John McMennell, MD, who was renowned for his expertise in manipulative diagnosis and treatment. He said that a normal ligament should not palpate painful. Exerting mechanical load on this area by way of friction massage, Graston Technique, or any deep-pressure method might be advised.

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