

Clinical Corner: Thoughts on Biomechanical Low Back Pain

By Richard DonTigny

I have described the biomechanical vulnerability of the sacroiliac joint to a subluxation in anterior rotation of the innominates on the sacrum at the S3 segment (SIJD) (1-6). Two pertinent changes (of many) occurring with this dysfunction in anterior rotation are 1) a tightening of the long posterior sacroiliac ligament (1,2,7) and 2) a loosening of the iliolumbar ligaments. The lower lumbar vertebrae are destabilized with SIJD increasing shear and torsion shear to the disk, which is probably the principal cause of degenerative disc disease. (1,2,8).

I also wish to point out the ilial ridge just superior to the corresponding S3 sacral segment, which effectively prevents any movement or dysfunction posteriorly of the innominate bones on the sacrum. The most likely mechanism of the so-called SI dysfunction in posterior rotation or upslip is a secondary movement at the S1 segment that occurs only with the original dysfunction in anterior rotation, however this mechanism is clinically insignificant as correction is the same as for the dysfunction in anterior rotation. (Previously described)(1,2,6))

In my analysis of the biomechanics of the sacroiliac joint I have found a critical flaw in the traditional manipulation of the sacroiliac joint, which is commonly used for a so called posterior dysfunction or upslip.(1,2) Because of this vertebral instability, when the patient is side-lying, pulling the shoulder back and shoving anteriorly and caudad on

the pelvis hard enough to produce cavitation in the joint can cause tears in the annulus at L4, 5-S1 and may cause extrusion of the disk. It may also tear or avulse the long posterior sacroiliac ligament from its attachment to the posterior superior iliac spine leaving the patient with an unstable sacroiliac joint. The described maneuver will only correct the upslip at S1, but may increase the dysfunction at S3 and probably should be contraindicated in the treatment of the sacroiliac joint.

There is one other essential point I would like to make. The primary painful points with SIJD are at the PSIS at the insertion of the long and short posterior sacroiliac ligaments and at the PIIS at the location of the S3 subluxation and the separation of the sacral origin of the piriformis muscle from its secondary origin at the superior margin of the greater sciatic notch. These points are both extra-articular and will not be affected by the 'Gold Standard' of injection into the intact joint. This inappropriate test may give a false negative result.

Low back pain has been described as having a multifactorial etiology, but these new proposals have demonstrated that it may be far more singular and predictable than generally thought. Low back pain behaves like a biomechanical lesion that can be reversed. Inappropriate biomechanical analysis leads to an incorrect rehabilitation procedures and increases chronicity.

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