High Velocity Thrust manipulation of the Lumbar Spine and Sacroiliac Joints

There are several HVT techniques for the sacroiliac joint. However it is only really the lumbar roll technique that allows for fine tuning of the relevant vectors for point specific manipulation.

The lumbar roll technique is classically taught as a manipulative technique to gap the lumbar and sacroiliac joints on the upper side of the patient when they are lying on their side. However the technique can also be used to gap the lumbar and sacroiliac joints on the lower side of the patient ie. the joints closest to the treatment couch.

This second version of the lumbar roll is common in Chiropractic technique texts and strangely absent in virtually all Osteopathic technique texts. This variation seems to be essential to achieve joint clearance through multiple thrusts and cavitations.

It appears to be a common misconception that one cavitation is sufficient to clear the sacroiliac joint lesion or restriction as this is generally the case with other joints. In this sense sacroiliac joints, if manipulated, are rarely cleared and therefore clinically significant results in the treatment of lower back pain as well as pelvic pain are not achieved.

First I want to demonstrate the lumbar roll set up for manipulating the upper lumbar facets and then I will move onto the sacroiliac joint.

In the classic lumbar roll set up the patient lies on their side with their lower leg straight and upper leg flexed at the hip to about 60 degrees and the upper knee also flexed to about 60 degrees. The upper foot can be hooked behind the distal calf of the lower leg. The patient is asked to hold the upper wrist with the lower hand.

The upper torso is rotated to the target joint. When targeting the lower lumbars this involves rotating the entire spine in loosely held full rotation. Adjusting micro vectors including rotation back up from the pelvis will target joints such as L4/5.

A small amount of generalised spinal flexion and posterior Iliac rotation is often helpful, particularly in lordotic patients, to present the lumbar spine and particularly the sacroiliac joint in a more neutral position . This can be induced when rotating the torso and also with a small amount of flexion of the lower leg. In this sense the patient lies in a somewhat curved position.

Inducing loose rotation and some additional flexion is most effectively achieved by contacting the upper torso.

This can be achieved with one arm by getting the patient to lift their head and reaching round to contact the upper thorax. The advantage of this technique is that the other hand can palpate the target joint to sense the movement coming toward it. Otherwise 2 applicators can be used to induce rotation through traction on the arm at the same time as contacting the upper thorax. Pulling on the arm alone will not allow for the production of extra flexion and can produce excess tension through the fascia that inhibits the use of micro vectors.

Now the patient is in the lumbar roll position, the practitioner stands facing the target joint with knees a little bent and feet pointing slightly toward the patient's head. The practitioner contacts the ilium with their closest forearm. For greatest patient comfort this is best applied with a pronated wrist so that the applicator is the flexor bulk rather than the Ulnar border. The practitioner's other arm is threaded through the gap between the patient's arm and flank. The practitioner's forearm is then in contact with the flank and the hand is free to support the lumbar spine when rotating the entire patient.

The practitioner rolls the patient in their entirety toward them and positions themselves over the target joint. It is at this point that the fine tuning of micro vectors is essential for locking or what I prefer to call "joint surface proximation".

According to Fryettes first law, coupling in the lumbar spine occurs with side-bending and rotation to opposite sides. Therefore the lumbar spine is generally locked with side-bending and rotation to the same side.

Depending on the patient, the spine may be in neutral or already have some side-bending induced to the upper side as the waist drops to the couch. In other words before adding any additional

vectors the patient is often already side-bent into the lordosis ie. side bent to the same side as the rotation in the lumbar roll position; typically at around L4/5. Often the greater the hip to waist ratio the greater the induced side-bending into the lordosis.

In a typical patient in the lumbar roll rotated to the right, there will be some side-bending to the right and the joint surfaces of L4/5 will begin to proximate.

Once the patient is rolled toward the practitioner, a little rotation up from the pelvis and some compression will focus forces on L4/5. Flexion/extension micro vectors can also be applied at this point. It should be noted that flexion will generally add more ipsilateral side-bending ie. into the lordosis and therefore lock the spine higher up and conversely extension will add contralateral side-bending ie. away from the lordosis which will unlock the joints. Compensatory side-bending may then be needed.

The application of these micro vectors is particularly important to achieve cavitation and essential to manipulate with minimal force, minimal energy and therefore minimal trauma and treatment reaction.

The assessment of these micro vectors is particularly difficult and requires the ability to sense the tissue tension accumulating in the facet joint. Sensing the plane and position of the facet is also essential to judge the optimal direction of the thrust. Ideally this tissue tension sense can be felt through the depths of the body with the proprioception of the practitioners forearms but this can take many years. A helpful shortcut or adjunct is to use the index or middle fingers of the non-thrusting arm to palpate the facet directly with the tips of the fingers.

Thrusting the lumbar spine requires a pure rotational thrust through the plane of the facet whilst maintaining compression. The thrusting arm follows a line perpendicular to the spine as if rolling over the pelvis like a cylinder and therefore rotating the spine. With the spine above the target joint stabilised, the movement is somewhat like wringing out a cloth.

The facet joints of the lumbo-sacral joint and for that matter the sacroiliac joint lie a little more in the coronal plane compared to the facets of the rest of the lumbar spine. This change in angulation requires a little spinal flexion. As previously stated adding flexion

will also add side-bending to the same side as the rotation. This may lock the spine higher than required. Therefore a little side bending in the opposite direction before inducing flexion is often required to compensate for this and to insure all vectors are targeting the lumbo-sacral joint. In this sense some contralateral side-bending ie. away from the lumbar lordosis is required before adding the flexion to target the lumbosacral joint. This is still in accordance with Fryette's laws even if at first glance it does not appear so.

As with all manipulative techniques following a formula will not get good results and developing good tissue sense and applying micro vectors is essential. Once again palpating the target joint with the non-thrusting hand may be useful.

Using the lumbar roll for sacroiliac joint manipulation is very similar to the lumbar spine but with some subtle differences.

As stated before some initial extra spinal flexion and hence nutation/posterior Iliac rotation is needed to varying degrees. The practitioner needs to be positioned a little further down the patients body to focus forces on the SI. As the sacroiliac joints are more medial than the lumbar facet joints, the patient needs to be rotated a little further toward the practitioner. Again getting a sense for the plane of the joint is essential and this is ideally achieved through the forearms but can to some extent also be felt with the fingers of the non-thrusting arm.

The primary vector for locking the sacroiliac joint is posterior Iliac rotation which is in the same plane as spinal flexion. In the same manner as with locking the lumbo-sacral junction adding a lot of posterior Iliac rotation will induce some side bending. Although this can be countered in a similar way by side-bending away from the pelvis it often useful to flex the entire spine first. This means less posterior Iliac rotation is required and also that the lumbar spine is flexed and more resistant to the sacroiliac joint thrust.

Once the patient is in a flexed lumbar roll position, the practitioner rotates the whole patient so that they are positioned over the sacroiliac joint. The practitioner rotates the ilium anteriorly and posteriorly and assesses the relative degree of shear in the joint. As the practitioner passes over the lesion a sense of reduced

movement or relative increased tissue tension can be palpated. This is the point of joint surface proximation. Again this can be assessed through the forearms or directly with the fingers of the non-thrusting arm.

Compression is a very useful vector. Extra compression can be induced by direct application of the practitioner's abdomen. This serves the extra function of acting as a brake to the thrust and increasing the patient's sense of safety.

Compression can be further increased by dropping the patients upper leg off the side of the couch. This also adds elements of shear and traction. Abdominal compression can also be added at this time. This technique may be employed if joint clearance is not achieved with the standard lumbar roll with both legs on the couch.

Sacroiliac thrusts should be conducted, while maintaining compression, through the plane of the joint precisely through the lesion. This generally requires a rotational thrust (wrt the spine as a whole) which curls in toward the practitioner's body. In this sense the thrust follows a line as if rolling over a cone. A sense for the precise direction should be gained from the initial set up and the direction of maximal tissue tension in shear.

The in-curling is necessary to maintain compression as well as applying a perpendicular application of force to the precise point of lesion.

The standard lumbar roll technique involves thrusting the Ilium on the sacrum ie. an Ilio-sacral thrust. The second version of the technique involves thrusting the sacrum on the Ilium.

The set up for this technique is much the same as for the first. The patient needs to be rotated a little further toward the practitioner and the contact is now on the sacrum rather than the Ilium. As with the first version a little side bending away from the lordosis often needed to get the pelvis in neutral before applying some nutation and compression.

It is possible that if the target joint is already posteriorised it may need less posteriorisation or less nutation. However just following a formula for the sacroiliac joint is almost useless and this is what makes manipulating them so difficult. Putting someone in the lumbar roll and thrusting them in a "hit and hope" fashion will get

some results. Doing the same for the SI might achieve the odd cavitation but will not produce joint clearance or good clinical results.

Sensing where the joint is in 3 dimensional space, sensing the plane of that joint, sensing where the lesion is on that plane of the joint and then sensing the joint surface proximation of that lesion with the application of micro vectors is essential.

Mastering both lumbar roll thrusts ie. sacroiliac thrust as well ilio-sacral thrust is essential for joint clearance, more often than not involving multiple cavitations.

This second version of the lumbar roll is also very useful for manipulating the lumbar joints. Both versions can of course also be used for thoracic and costo-vertebral joints up to and including T5 and rib 5.