



Lumbo-Pelvic-Hip Complex (LPHC) Approach Using Sacral JET for Lumbogenic Pain

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Abbreviations: LPHC: Lumbo-Pelvic-Hip-Impairments; ALE: Active Lumbar Extension

Sacral JET Approach

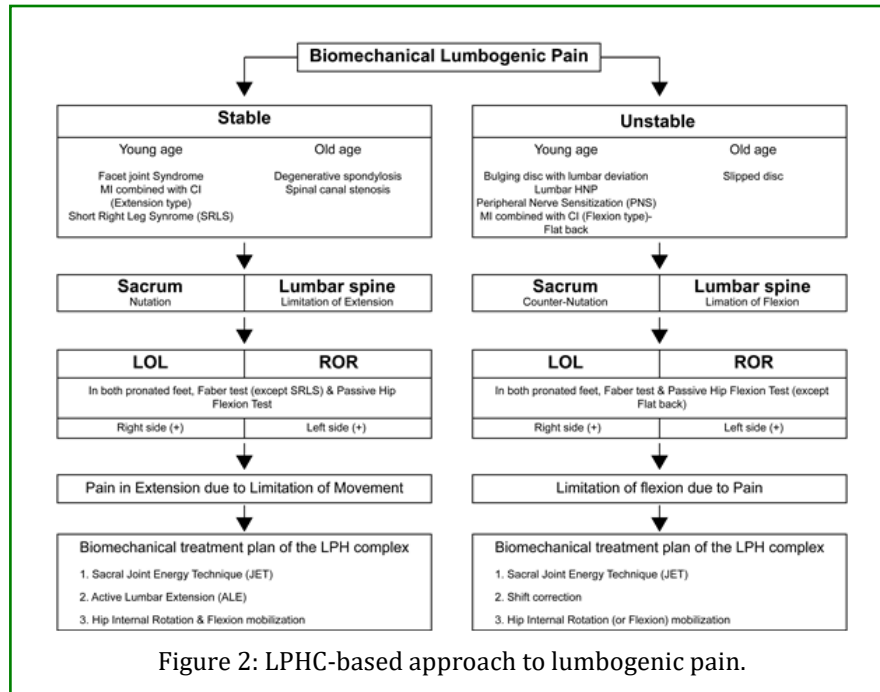
The JET, a type of Chuna manual therapy, is a concept designed for a more concise and reasonable approach to diagnosing and treating lumbogenic pain (Figure 1).

| Sacral type | Lumbar motion | Lumbar manual therapy | Faber test | Sacral JET | Underlying disease |
|---|------------------------------------|---|------------|--|--|
| LOL (neutral) Nutation | Right rotation, Left side bend | Extension, Left side bend, Right rotation | Right | Flexion, Lumbar Left rotation, Sacral Right rotation | MI combined with CI (Extension type), Spinal stenosis, Degenerative spondylosis |
| | Same | Same | Left | Same | Right short leg syndrome(Right side foot supination, Left side foot pronation) |
| LOR (non-neutral) Counter nutaton | Right rotation, Right side bend | Extension, Left side bend, Right rotation | Right | Extension, Lumbar Left rotation, Sacral Right rotation | MI combined with CI (Flexion type), Disc protrusion, HNP |
| ROR (neutral) Nutation | Left rotation, Right side bend | Extension, Right side bend, Left rotation | Left | Flexion, Lumbar Right rotation, Sacral Left rotation | MI combined with CI (Extension type), Spinal stenosis, Degenerative spondylosis |
| ROL (non-neutral) Counter nutaton | Left rotation, Left side bend | Extension, Right side bend, Left rotation | Left | Extension, Lumbar Right rotation, Sacral Left rotation | MI combined with CI (Flexion type), Disc protrusion, HNP |

Figure1: Dr. Cho's sacral JET approach.

Biomechanical overload on the LPHC occurs in a descending postural distortion pattern at the top, beginning from the head and moving toward the bottom; and in an ascending postural distortion pattern at the bottom, beginning from the feet and moving toward the top [1-3]. Treatment of lumbogenic pain from the LPHC perspective involves sacral JET and manual therapy on

the lumbar spine and hip joints simultaneously, focusing on pelvic dysfunction that compromises stability (Figure 2). The sacral torsion is categorized into four types (LOL, ROR, LOR, and ROL), and the biomechanical motions of the lumbar spine and hip joints are considered during diagnosis and treatment.



Sacral motion broadly occurs along the transverse and oblique axes. In sacral nutation, i.e., a forward-bending posture along the transverse axis, the self-locking mechanism of the SIJs generates a more stable standing posture—the “neutral position.” The sacrum also produces axial rotation along the left or right oblique axis in gait, i.e., sacral torsion. LOL refers to forward-bending torsion to the left in the sacrum with the left oblique axis as the center. In sacral counter-nutation, i.e., a backward-bending posture along the transverse axis in sacral motion, the self-locking mechanism of the SIJs is disengaged, resulting in a relatively less stable standing posture, i.e., the “non-neutral position.” In sacral torsion along the oblique axis in gait, LOR means the presence of backward-bending torsion to the left in the sacrum with the right oblique axis as the center [4,5].

LPHC Approach using Sacral JET in a Stable Situation

In LOL and ROR, the sacrum is bent forward along the axis to the direction of the gait, which translates into a relatively more stable structure. Of these two types, this

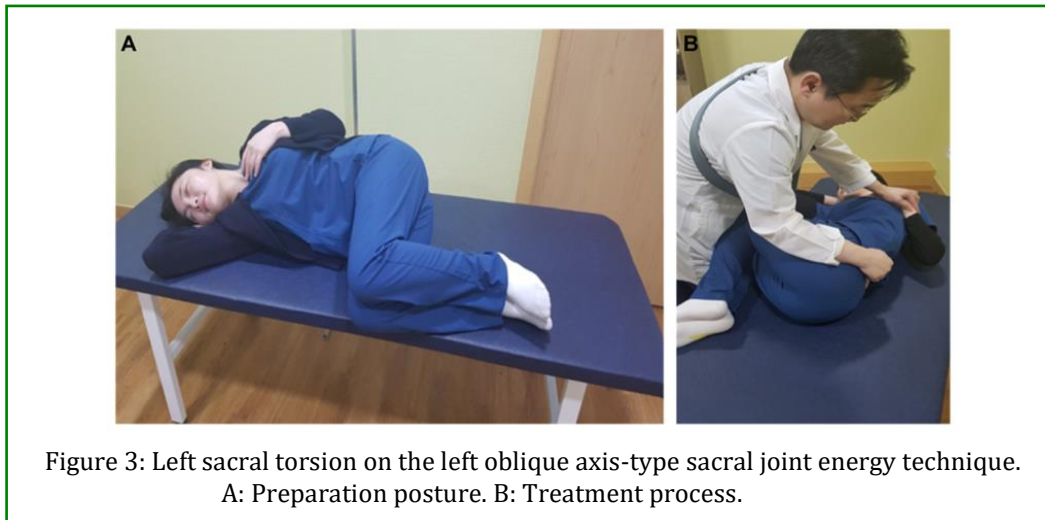
study addresses the LOL type, commonly found in outpatient care, to present a biomechanical explanation of the LPHC approach through sacral JET. The pelvic girdle is where the descending load from the head to the sacrum and the ascending load from the feet to the ilium overlap, a feature that influences the balance and stability of the body. Therefore, it is necessary to consider the sacral torsion from the descending postural distortion pattern and the innominate rotation from the ascending postural distortion pattern together. In LOL, left forward sacral torsion restricts lumbar extension, and given the lumbar side-bending to the left, the axial direction in gait, constrains lumbar side-bending to the right. The combined effect of the internal rotation of the lower right limb arising from a pronated right foot and the LOL-induced intra-pelvic torsion causes the right innominate to rotate to anteriorly. To further describe the intra-pelvic torsion in such cases, the innominate moves relatively more than the sacrum in gait; hence, the right sacrum becomes more counter-nutated compared to the left sacrum. This creates a relatively less stable situation on the right side, where the innominate is rotated anteriorly, thereby increasing the likelihood of pain [6].

In LOL, except in individuals with short right leg syndrome (SRLS), the anterior rotation of the innominate and the resulting internal rotation of the hip joints lead to a positive Faber test on the right side. Moreover, the anterior pelvic tilt restrains posterior rotation of the right innominate, which translates into a positive hip flexion test on the right side. In SRLS, the right innominate demonstrates posterior rotation alongside hip external rotation, and supination of the right foot is maintained [7]. LOL involves sacral nutation, which causes anterior pelvic tilt, and is thus closely associated with disorders that accompany restricted lumbar extension. Typical examples include MI combined with CI extension and facet joint syndrome, as well as degenerative spinal disorders. A reduced intervertebral space causes lumbar flexion as compensation to reduce compression inside the spinal canal, which increases the likelihood of restricting extension motions; this is a characteristic of degenerative spinal disorders, including spinal canal stenosis.

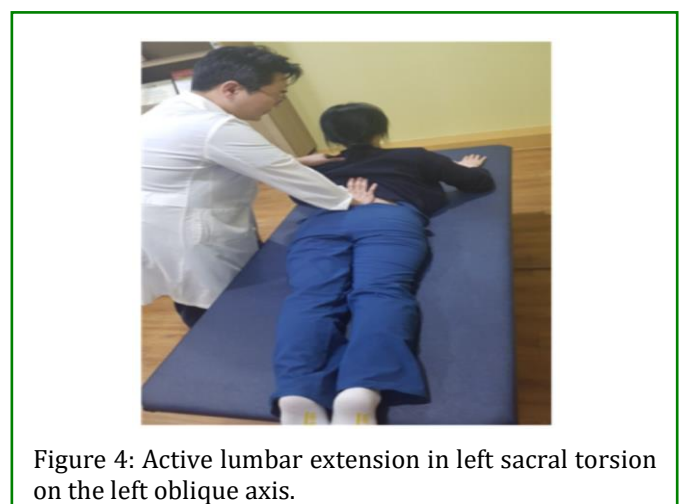
In the LPHC approach to LOL through sacral JET, the following steps are performed:

- Sacral JET is performed to correct sacral torsion.
- Active lumbar extension (ALE) is performed to bring the restrained extension and side-bending movements back to normal.
- Hip joint mobilization is performed to correct hip internal rotation and excessive anterior rotation of the innominate.

First, to perform sacral JET, the left-rotated sacrum is rotated to the right and the lumbar spines rotated to the left in order to expand the right rotation of the sacrum. This is accompanied by flexion of both legs to increase the posterior pelvic tilt, with both knees bent to maintain lumbar flexion, with the aim of fixing sacral nutation. Simultaneously, the left sacral base is lightly patted to increase right rotation of the sacrum (Figure 3 (A,B)).



Second ALE is performed with sacral JET to further improve the balance between the lumbar spine and pelvic girdle. Among lumbar movements, the LOL type involves restricted extension, left side-bending and right rotation. To address this condition, the lumbar spine is side-bent to the left in a prone position, i.e., pelvic tilt is induced by pushing both legs to the left. Then, the spinose process of the fourth or fifth lumbar vertebra is fixed, and ALE is performed to increase lumbar extension, thereby further promoting lumbar segmental mobility (Figure 4).



Third, the internally rotated hip joints are corrected to adjust their balance from the LPHC perspective. It is assumed that femoral ante-version is found in both hip joints, and as compensation, both feet are pronated [8]. To correct hip internal rotation arising from the aforementioned femoral ante-version and pronated feet,

manual therapy is performed to further rotate the hip joints internally toward the acetabular center axis. Additionally, to correct the anterior rotation of the innominate caused by the internally rotated hip joints, hip flexion mobilization is performed to induce the posterior rotation of the innominate (Figure 5(A,B)).



Figure 5: Manual therapy of the hip joints.
A: Hip internal rotation mobilization. B: Hip flexion mobilization.

LPHC Approach using Sacral JET in an Unstable Situation

LOR and ROL involve a backward-bent sacrum, and thus, form a relatively unstable structure. Of these unstable types, this study addresses LOR to provide a biomechanical explanation of the LPHC approach using sacral JET. In the LOR type, sacral counter-nutation occurs due to left backward sacral torsion with the right oblique axis as the center, and consequently, restricts lumbar flexion. Lumbar side-bending also occurs to the right, the axial direction in gait, which translates into limited left side-bending. The combined effect of internal rotation of the lower right limb, which stems from pronation of the right foot (the supporting foot in gait), and the LOR-induced intra-pelvic torsion causes the right innominate to rotate anteriorly. The left innominate, adjacent to the articular surface of the left sacrum (with the foot on this side raised), undergoes intra-pelvic torsion as it rotates posteriorly, and accordingly, becomes twisted backward with the fixed axis of the right sacrum as the center.

Innominate in such gait makes larger motions than the sacrum does; the right sacrum is thus relatively counter-nutated compared to the left sacrum. Therefore, the right innominate, given its anterior rotation, forms a relatively less stable situation than the left innominate does, resulting in a higher likelihood of pain on the right side.

These circumstances lead to a positive Faber test result, owing to the anterior rotation of the right innominate and the resulting internal rotation of the hip joints. Additionally, the limited posterior rotation of the right innominate leads to a positive passive hip flexion test on the right side because apart from a flat back, the pelvic girdle forms a relative posterior tilt; nonetheless, the overall anterior pelvic tilt stays in place. In the case of a flat back, the passive hip flexion test returns a negative Faber test result due to the presence of actual posterior pelvic tilt. The disorders that can be caused by LOR include bulging discs with lumbar deviation, which arises from a stable situation trans-mutating into an unstable situation; other disc problems; and MI combined with CI

flexion. Where disc problems are present, including bulging discs with lumbar deviation, flexion produces positive pressure, which provokes pain by irritating the dura or pressing the nerve roots and then restricts lumbar flexion [9,10]. From a clinical perspective, MI combined with CI flexion demonstrates the characteristics of MI, where flexion produces a heavy sensation or causes pain immediately, along with the features of CI-i.e., sacral dysfunction, where lumbar flexion increases pain due to the impaired control of anterior pelvic tilt caused by posterior pelvic tilt.

First, in the LPHC approach using sacral JET in LOR, the left-rotated sacrum is rotated to the right, and left rotation is induced in the lumbar spine to increase right rotation of the sacrum. Further, to correct sacral counter-nutation, sacral nutation is generated by inducing lumbar extension, and with both legs flexed to promote nutation, both legs are extended simultaneously to increase the anterior pelvic tilt. This is accompanied by light patting of the left sacral base aimed at increasing right rotation of the sacrum (Figure 6 (A,B)).

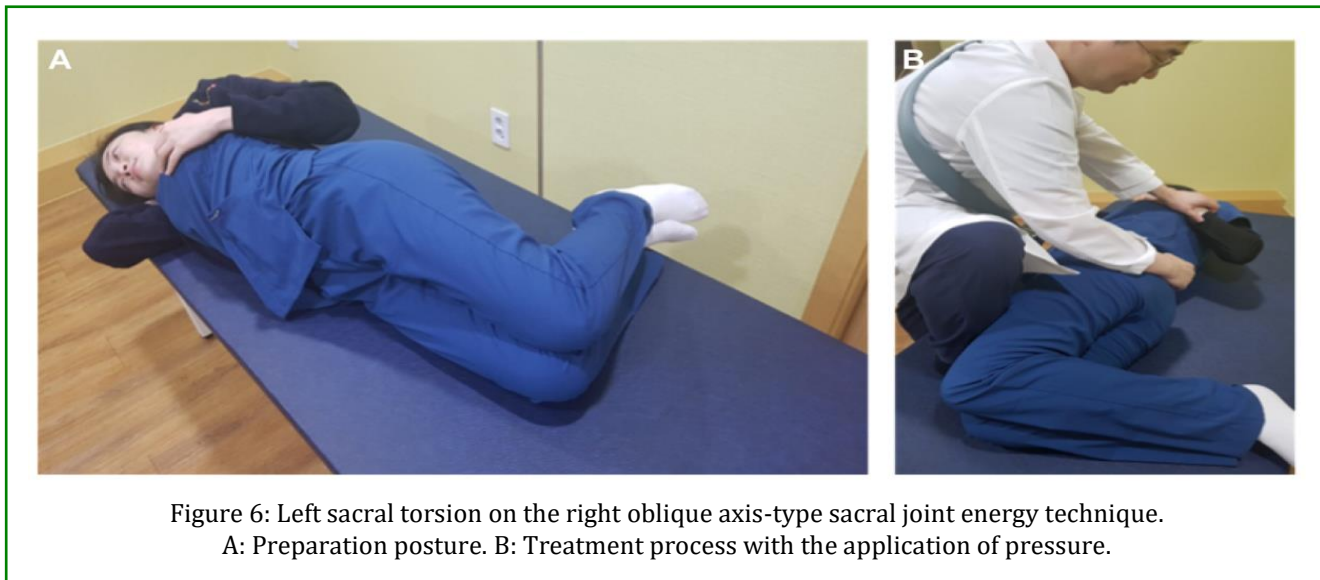


Figure 6: Left sacral torsion on the right oblique axis-type sacral joint energy technique. A: Preparation posture. B: Treatment process with the application of pressure.

Second, in implementing sacral JET in clinical settings, shift correction can further improve the biomechanical balance of the lumbar spine and pelvic girdle using intradiscal decompression. For example, shift correction on LOR should be performed in a way that increases lumbar extension while maintaining left lumbar side-bending in a prone position, i.e., both legs are pushed to the left to induce pelvic tilt. The side-bending is aimed at reducing the pain stimulus as the lumbar flexion and right side-bending elevate positive intradiscal pressure and thereby, result in painful sensations. In disc problems apart from MI combined with CI flexion, balancing the pelvic girdle through lumbar side-bending requires a biomechanical perspective and therapy that considers the pain caused by intradiscal displacement in pathological situations so that an analgesic posture can be maintained.

Third, from the LPHC perspective again, the internally rotated hip joints with limited flexion are corrected to adjust their balance (Figure 5 (A,B)). The aforementioned sacral JET therapy for disorders in an unstable situation aims to provide optimal treatment through the LPHC approach to lumbogenic pain from a biomechanical

perspective and with the consideration of pain arising from pathological situations.

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