

Pelvic Unleveling

Kim Christensen, DC, DACRB, CCSP, CSCS

The most useful method of determining pelvic unleveling is to involve examining the patient in normal, upright posture. This eliminates much of the confusion surrounding this topic and simplifies treatment decisions. Whenever we check a patient on the treatment table, whether prone or supine, errors of positioning are introduced (and are very difficult to exclude).

Measurements of pelvic balance obtained in the non-weightbearing position have been found to be very unreliable.¹ In a relaxed, upright posture, these confounding factors are not present. Accurate clinical and radiographic determinations are then possible,² and effective chiropractic care can proceed.

Determining Anatomical Sources

When evidence of pelvic unleveling has been identified in the standing position, efficient treatment depends on the anatomical source of the misalignment. Either the pelvis or the lower extremities must be the cause of the biomechanical imbalance. If it is the pelvis, treatment will need to be directed to this region. When the cause is in the lower extremities, successful care can be expected only with evaluation and correct treatment of the foot, ankle or leg asymmetry. Since the lower extremities provide the foundation and support for the pelvis during standing and walking, it is not surprising that they can have a profound effect on the alignment of the pelvis and spine.

Determination of Causal Factors

Whether the pelvic unleveling originates in the pelvis or the lower extremities, the cause must be either an anatomical asymmetry or a functional imbalance. Anatomical sources include growth asymmetries, anomalies and postfracture discrepancies. Functional problems encompass subluxations and biomechanical imbalances. Since these two categories are treated very differently, they must be separately identified. Here are the details of these causes in the two regions:

In the Pelvis

Anatomical asymmetry: A very small percentage of patients will demonstrate pelvic unleveling caused by a growth asymmetry or an old fracture of an ilium. The innominate bones can develop with a substantial difference in height, although this is rare. Luckily, it also is the least likely to cause symptoms. For sedentary patients, an ischial lift (a wedge under the "sit-bone" of the smaller side) can prevent problems from developing when seated for long periods. For most patients, standard chiropractic care of biomechanical problems in the spine and pelvis is sufficient.

Functional imbalance: Much more common in the pelvis is a biomechanical source of pelvic unleveling: sacroiliac joint subluxations. This condition can be caused by work postures, recreational habits, or even a broken-down chair at home. Muscle imbalances are frequently part of this syndrome, the most common being weakness of the hip extensor muscles. Tightness of a psoas muscle, or shortening of the hamstrings from excessive sitting, can also contribute to pelvic

unevening. An "antalgic" posture, in response to acute pain and inflammation of the lower spinal joints, often results in a difference in height of the iliac crests.

Treatment should include specific stretches targeted to shortened muscles, with strengthening and stabilizing exercises for weak or poorly coordinated muscles. Specific adjustments of the pelvis and lumbar spine are necessary to regain normal pelvic biomechanics and full function of the region.

In the Lower Extremities

Anatomical asymmetry: Some patients have a difference in the anatomical components of the lower extremities, which results in pelvic unevening. This may be the result of a fracture of the tibia or femur that healed with persisting shortness, but much more likely is a simple growth asymmetry. In fact, it is quite amazing that most of us have no significant difference in the length of our legs. Somehow, most legs grow to an equal length at adulthood. Those that end up with a difference in length over 9 mm (measured while standing) have a higher incidence of low back pain.³ Athletes and those who spend a lot of time on their feet may develop chronic symptoms with 5 mm, or even just 3 mm of discrepancy.⁴

Functional imbalance: The most commonly seen cause of pelvic unevening is loss of support from the foot, in particular due to collapse of the medial arch. When the arch drops (excessive pronation), the leg rotates medially and the femur head drops, causing an uneven pelvis. Excessive pronation may occur from a young age through lack of development of the arch, but most commonly it occurs in later years when the ligaments that support the arches undergo plastic deformation. Since this process usually happens gradually over many years, there is often no significant foot pain. The patient with this condition begins to develop chronic low back and pelvis problems, but doesn't any foot symptoms. The doctor of chiropractic must always have an index of suspicion and include a lower extremity postural exam in the evaluation of most new patients. When there is evidence of pelvic unevening, investigation of the feet and ankles, along with inspection of shoe wear patterns, is necessary.

Lift vs. Orthotic

It is very important to recognize the functional short leg, since providing a lift instead of an orthotic is likely to perpetuate the associated sacroiliac subluxations.⁵ There is no reliable information on the radiographs to differentiate between these conditions. A pelvic tilt, a lower sacral base, and a femur head discrepancy may indicate a lower extremity source, but not whether it is an anatomical or functional short leg. The clinical postural exam with lower extremity screening is the only way to make this determination. If there is any doubt, the safest approach is to fit the patient with flexible, custom-made orthotics initially. If there is a persisting pelvic tilt after wearing the orthotics for several weeks and receiving chiropractic adjustments, a heel lift can easily be added to the orthotic for complete correction.

Conclusion

Once pelvic unevening has been found in a patient, effective treatment can be planned. The first step is to differentiate whether the source of the imbalance is in the pelvis or the lower extremities. This may require accurate, standing radiographs taken without projectional distortion. A determination of anatomical asymmetry or functional imbalance will then help guide treatment. Most commonly, the lower extremities do not provide the necessary support for the pelvis. In many cases, orthotic support for foot pronation, knee rotation or femur angulation is needed. Those few patients with a true anatomical leg length discrepancy will need to be supplied with the

appropriate lift. The cost of additional time required to determine the source of the pelvic unleveling will be repaid in more effective chiropractic care and longer lasting adjustments. The gratitude of patients who have finally found a doctor interested enough to individualize their treatment will help build a tremendous practice. This level of service ensures a great future for chiropractic, no matter what the insurance companies say or do.

References

1. Woerman AL, Binder-MacLeod SA. Leg length discrepancy assessment: accuracy and precision in five clinical methods of evaluation. *J Orthop Sports Phys Therap* 1984; 5:230-238.
2. Friberg O, et al. Accuracy and precision of clinical estimation of leg length inequality and lumbar scoliosis: comparison of clinical and radiological measurements. *Int Disabil Studies* 1988; 10:49-53.
3. Giles LGF, Taylor JR. Low back pain associated with leg length inequality. *Spine* 1981; 6:510-511.
4. Subotnick SI. Limb length discrepancies of the lower extremity; the short leg syndrome. *J Orthop Sports Phys Therap* 1981; 3:11-16.
5. Rothbart BA, Estabrook L. Excessive pronation: a major biomechanical determinant in the development of chondromalacia and pelvic lists. *J Manip Physiol Therap* 1988; 11:373-379.

APRIL 2000