Dynamic Chiropractic

ORTHOTICS & ORTHOPEADICS

To Heel Lift or Not to Heel Lift? That is the Question

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On at least a weekly basis, patients come to me after visiting the "foot doctor" or another health professional, telling me they have a short leg. The situation is complicated because these patients often have been given a heel lift to automatically begin compensating for this short leg. In many cases, this "solution" actually creates more problems. Why? After all, it seems simple: If the leg is short, put something underneath it to make both legs even, right?

Much of the time, our patients are not given all of the facts and/or do not receive thorough explanations for conditions for which they are diagnosed. These patients believe they are, in fact, walking around with one leg physically shorter than the other. Only in a few cases is this true. But patients are often confused, and it's up to us, doctors of chiropractic, to educate them.

A leg-length difference can cause a great deal of pain and needs to be addressed as quickly as possible. In fact, research suggests a leg-length difference (measured while standing) of 5-9 mm or more results in a higher incidence of low back pain.[1] Athletes and people who spend considerable time on their feet may develop chronic symptoms with just 3 mm of discrepancy.[2]

It is important to make the distinction between the anatomically short leg and the functionally short leg. It might at first seem like splitting hairs, but the two concepts have radically different meanings for the biomechanics of the body, and each benefits from its own specific treatment.

Anatomical Leg-Length Inequality

Anatomical leg-length inequality (ALLI) occurs when the femur or tibia of one leg is physically shorter than in the other leg. There are various reasons why ALLI exists:

- *Congenital* – The patient was born with tibia or femur bones that did not grow as long on one leg as the other.
- *Traumatic* – This is important particularly during childhood, when the trauma is to the "growth plate" of one of the leg bones. This particular type of trauma will cause a slower rate of growth of the length of the bone as the child ages.
- *Degenerative* – As arthritis erodes cartilage, it reduces the joint space between the hip or knee.
- *Neoplasm* – Cancerous erosion or destruction of bone not only will have an impact on its strength, but also can shorten the long bone as a result of the damage.
- *Iatrogenic* – Many patients who undergo total hip arthroplasty (replacement) find that the artificial joint was made to the wrong length, resulting in ALLI. (Many of these people did not have ALLI previously.)

Historically, we have quantitative measurement procedures that allow us to determine if there is an anatomical or structural shortening present:

- *Apparent Leg-Length Test:* The patient is supine and the tape measure starts at the umbilicus

and goes down to the medial / lateral malleolus. Compare bilaterally.
- *Actual Leg-Length Test:* The patient is supine and the tape measure goes from the ASIS to the medial / lateral malleolus.
- *Allis Test:* Your patient is supine with their knees bent and their feet aligned. Compare the evenness of the knees. If one knee extends past the other, then there is a short femur on the short side. If one knee is higher than the other, then there is a short tibia on the low side.

From a clinical standpoint, the measurements described above have been traditionally taught to us with the patient in a weight-bearing position. The reality is that measurement and positioning errors can occur more frequently in a non-weight-bearing position. Recent research has found measurements of leg-length discrepancy obtained in non-weight-bearing positions to be unreliable.[3]

It is ideal to utilize the leg-length and Allis tests in a standing position. If you want to take it a step further, X-ray your patient in a standing position. "The criterion standard for anatomical LLI is the scanogram, radiograph of both femurs and tibias; so comparisons can be made. This procedure is considered a valid indicator of lower extremity length."[4]

As doctors of chiropractic, you and I have a solid understanding of biomechanics and the axial kinematic chain. We understand how small changes in posture or joint position can create a short-leg phenomenon. In practice, most of us will be dealing with the functional short leg.

Functional Short Leg (FSL)

This common type of leg-length inequality is a result of rotational patterns of the pelvis and hips. It can also be affected by misalignments or torsional movement in the knee, ankles and feet. The most common cause of FSL is overpronation, more on one side of the body than the other. Another less common cause is knee valgus.

In many cases of functional short leg, as evidenced by radiographic study, the use of scientifically designed, custom-made orthotics has been shown to help eliminate musculoskeletal deficiencies and improve patient outcomes.[5] Providing symmetrical support for both feet with orthotics is important when recognizing the functional short leg because providing a lift – instead of an orthotic – will likely perpetuate the associated sacroiliac subluxations.[6]

Posture Is Revealing

Since overpronation is a common cause of FSL in patients, we can use our eyes to help us determine what is happening. Make sure the patient is standing without socks on a solid surface and in a comfortable position. The patient *should not* correct their feet position such that they are pointing forward. Instead, the patient should be in a natural standing position. This way, some of the dysfunctional postural patterns will be easier to pick out during the evaluation, since this is how the patient usually stands.

When pronation occurs on both feet, it is typically worse on one side than the other. It is on the worse side where one usually finds the FSL. Starting from the feet, look at the inner arches and Achilles tendons as indicators of arch collapse. Move up the tibias to the knees and look for the increased medial / internal rotation that can create knee valgus and medial movement of the patellae.

Look at and palpate the iliac crests and the greater trochanters to see if they are of unequal height. Finally, look and palpate the lumbar spine. A typical postural distortion for a short leg will create a lumbar scoliosis whose convexity moves toward the side of the FSL.

Now, how can you tell if it's an ALLI or an FSL? Perform the following:

- Have the patient roll their feet outward (into supination) and hold that position for about 10 seconds while you look at and feel the hips, greater trochanters and lumbar spine. Do you see any correction or leveling off of these areas?
- Place a sample pair of flexible, three-arch orthotics under both feet. Even though these orthotics are just a sample pair and not custom to this patient, the increase in the support for all three arches will tell you how well the pelvis, hips and lumbar spine level off.
- Use leg-length analysis. It is a concept many are exposed within the first year of chiropractic school. Some embrace it and carry it through into practice, while others believe it is unreliable. Regardless of your philosophy, leg checks do become easier (thus, more reliable) with practice and can yield a lot of useful information about biomechanics and how to further treat the patient.

After doing the leg checks and analyzing the short leg, perform the adjustments and recheck. If that leg is still short and you have cleared out the lumbar spine, pelvis, hips, knees and ankles, you are dealing with an ALLI. If it levels off, it is an FSL.

Correction Protocols

If you are dealing with an FSL, perform adjustments to clear out all of the indicators and level the pelvis. Then scan or fit the patient for a pair of custom, stabilizing orthotics. The arch support provided by orthotics will stabilize the pedal foundation, reduce the effects of the axial kinematic chain, and significantly reduce the effects of pronation and the presence of the FSL. Remember, most of the patients who walk into our office have an FSL. We just need to evaluate them properly to confirm.

In cases in which ALLI is present, here is a good protocol to follow: After you have measured your patient's actual leg-length discrepancy, it is always a safe bet to undercorrect. The classic rule of thumb is to cut the LLI in half and then start with the appropriate-sized heel lift. Incorporate this protocol:

- Scan or cast the patient for a pair of custom, stabilizing orthotics.
- Proceed to a 3 mm lift and have the patient wear this for two weeks. Then re-evaluate.
- Proceed to a 5 mm or 7 mm lift only if necessary. Use the two-week break-in period as indicated above. Then re-evaluate.

I have found in my practice that just putting the custom orthotics in the patient's shoes often will allow the body to balance out so well that further heel lift correction is not necessary. When I need to use a lift, I have rarely gone past a 3 mm.

From a practice standpoint, it is very important to be able to confidently determine if someone truly has a short leg due to anatomy or functionality. Using a heel lift as a shotgun approach to every patient with a short leg can create disastrous effects on the body.

Please take the information in this article to heart and use it. You can really change someone's life

simply by removing the heel lift when they don't need it. But you need to make sure you are correct in doing so. Practice and knowledge will build your confidence.

References

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