

Neuromuscular Therapy Treatment Helps Alleviate Functional Leg Length Discrepancy

Introduction

1. Importance of the case: According to a paper by Burke Gurney of the University of New Mexico School of Medicine, Division of Physical Therapy Leg Length Discrepancy (LLD) is a relatively common problem found in as many as 40% to 70% of the population. Another study found that LLD of greater than 20 mm affects at least one in every 1000 people.

2. Terms that must be understood to understand the case:

a. **Pelvic Obliquity** – When the ASIS and PSIS on the same side of the body are higher than the ASIS and PSIS on the other side of the body.

b. **Musculoskeletal injury** – refers to damage of muscular or skeletal systems, which is usually due to a strenuous activity.

3. The condition

a. Limb length discrepancy is defined as a condition in which paired limbs are noticeably unequal. When the discrepancy is in the lower extremities, it is known as leg length discrepancy (LLD).

b. LLD has been implicated in a variety of disorders including LBP, scoliosis, arthritis of the spine, hip pain, lower extremity stress fractures, and many more.

c. Some common treatments range from shoe inserts to various surgical techniques including limb lengthening and shortening. Although it is understood that that cause of functional LLD is shortening of certain muscles, the common non-surgical treatment still is a shoe insert.

d. The causes of Functional LLD (as opposed to structural) are mostly muscle (tightness/weakness) or joint tightness across any joint in the lower extremity or spine. Some of the more common causes include pronation or supination of one foot in relation to the other, hip abduction/adduction tightness/contracture, knee hyperextension due to quadriceps femoris weakness, and lumbar scoliosis.

4. Literature Review

a. Keywords used in the search for more information on LLD were:

- Leg Length Discrepancy
- Anisomelia
- Limb Length Discrepancy

b. Relevant articles found:

- Leg length discrepancy, Burke Gurney
- Leg Length Discrepancy, Cedars-Sinai web page
- PNMT Form and Function Seminar manual, Douglas Nelson

c. What information from those articles is pertinent to your case?

- Leg length discrepancy, Burke Gurney – The statistics and definitions
- Leg Length Discrepancy, Cedars-Sinai web page – Common treatment protocols
- PNMT Form and Function Seminar manual, Douglas Nelson – The treatments and tests I used came from this seminar

The Case

5. Subject

a. Demographics of subject:

- Female
- 48 Years Old

b. Relevant medical history – Subject initially came to my office with a chief complaint of LBP. Subject also stated she cannot lie on her stomach without pain in the lower back and right hip. While conducting clinical reasoning the subject stated, “...one doctor even told me one leg was shorter than the other....but they “fixed” that with a shoe insert.”

c. Other treatments and results – Subject visited other medical practitioners who prescribed various pain relieving medicine and muscle relaxers.

d. Subject’s goals from treatment – First and foremost, the subject wanted to have some relief from her pain. The subject is active and athletic; the pain is limiting her activities and affecting her quality of life.

e. Contributors to the subject’s condition – The subject’s profession is an instructor at a military school. She is on her feet for the majority of the day and the LBP increases as the day goes on. The subject also spent 20 years in the Army and all of the Army training was a definite contributor to her condition.

6. Treatment

a. Pre-Tx Measurements:

- Visual estimate of Pelvic Obliquity – Left hip approx. $\frac{3}{4}$ ” higher
- Visual estimate of Shoulder – Horizontal Plane left shoulder lower approx. $\frac{1}{2}$ ”
- Leg Length Discrepancy – Left leg approx. $\frac{1}{2}$ ” shorter
- Standing fingertip to the floor – Right Side 24.5”; Left Side 24”

b. Treatment Details:

Because of the LBP complaint, I initially tested the QL for restriction. With the high hip on the left side, I first tested the QL with a side bend to the left. However, when setting up for the QL length test, I noticed the hip obliquity. That’s when the subject stated that she had one leg shorter than the other. Examining the shoulders, it was obvious that the right shoulder was

higher than the left. While still standing and forward facing, I compared the trochanteric heads, and the crease behind the knees, this comparison was consistent with the left leg being shorter. With the subject bent at the hips, the PSIS seemed to level out, however it was difficult to discern. I asked the subject to remove her shoes and lay down supine on the treatment table. By looking at the medial malleolus, the left leg was in fact shorter, however when the subject sat up, the difference in length was not noticeable. The PSIS was also level (eliminating any pelvic deformity).

From clinical reasoning, my treatment plan included the QL, Multifidi, Erector Spinae, Serratus Posterior Inferior and because of the shoulder, I also included the Latissimus in the treatment plan. Due to the QL indicated in the initial tests, and knowing there is a chance that the QL may drop the side it is shortened; I treated the left QL first. I had the subject lay sideline with a bolster under her side to open the QL. The entire QL was very non-compliant; however there were no noticeable TrP. The QL soon relaxed from its shortened state. All muscles were treated in the same sideline position. Although no TrP were found, all muscles treated were non-compliant and very tense.

Following the treatment, I demonstrated a series of lower back stretches to reduce the chances of the muscles getting to such a shortened state.

7. Results.

	Prior to Treatment	Post Treatment
Left hip	3/4" higher	Level
Left Shoulder	1/2" lower	Level
Left Leg	1/2" shorter	Level

Discussion

8. Conclusion:

The results of this case seem remarkable considering after a single treatment the obliquities and discrepancies were eliminated. The subject made one additional follow-up office visit with positive results and no return of the problems previously plaguing her.

The take-away from this study is to test the subject's chief complaint and continue testing to eliminate the resulting issues from the main cause of the complaint. Other practitioners simply treated the symptom without determining the true cause.