

Case Report: Scoliosis and the Short Leg

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Case History

The patient is a 29-year-old man with a known history of a scoliosis. His symptoms started around age 16 when he began to experience back pain. There is more recent pain over the past four years involving the left lower extremity (knee pain). He is most concerned with his gait.

General postural inspection and gait without fitted orthotics demonstrated external rotation of the left lower extremity and rollover, anterior-inferior slumped left shoulder with head rotation to side of weakness, left inferiority noted with increased unilateral weight-bearing. Surprisingly, no Adam's or rib hump was observed. Chiropractic spinal listings were detected at vertebral levels C0/1, L4/5, T8/T9 and PLI-SI. Allis testing was positive for left femoral shortening.

Measurements: umbilicus to medial knee: L: 23," R: 24.25." ASIS to medial knee: L: 20" R: 21.25." Confirmed by supine Allis test: left knee is lower; right is higher with maleolus in alignment.

Radiological findings on the views submitted from outside imaging lumbar series revealed congenital findings: spinal bifida L5/S1, slight facet tropism with rotatory-type scoliosis L4-5-S1, spinous rotated to the concavity, L4/ L5 open left wedge. Pedicles were not rotated; Cobb's angles not determined.

Correction: Additional views were obtained and consisted of a subsequent series of three AP pelvis views; all weight-bearing. One barefoot view revealed pelvis rotation left iliac crest declination at 22 mm, left ischium at 7 mm; one with previously fitted orthotics (for pes planus) revealed 12 mm left iliac pelvic declination and 3 mm left ischium declination; and one with orthotics and the addition of a unilateral 5 mm heel lift revealed a reduction to 5 mm ileum pelvic declination and ischium leveled, with resultant de-rotation of the bodies of L3-5 vertebrae previously rotated to the left low side. (Convexity of curvature is normally, as in this case, on the low side.)

Final diagnostic impression: tortipelvis lumbar compensatory scoliosis due to left structural leg-length discrepancy.

Discussion

This patient was advised that he may require a prosthesis boot for greater comfort. Supragenetic forces can alter subluxations listings as the spine shifts in response to the inferiorities (short leg), in this case, structural. Inadequate function of the right reflex and/or equilibrium problems can cause disproportionate weight-bearing loads on the vertebrae and their discs. When body-balancing mechanisms are not functioning properly, the spine may tower off to one side (with or without inferiority). This leaning-tower-type of spine pulls up on the annular fibers of the disc on the side opposite the lateral tipping and creates a pulled-up-type disc wedge. This will compound the problem and requires immediate heel lift and subluxation(s) correction.

Giles reported in the literature that a leg-length inequality (LLI) of greater than 10 mm leads to asymmetric endplates, vertebral body height, and traction spurs, i.e.; degenerative arthritis, due to focal weight bearing. Studies also indicate that 75 percent of those with a history of chronic low back pain, hip pain and/or sciatic type pain have an LLI. This correlates with the chiropractic findings of the use of dual weight scales in assessing inequality.

LLI can occur due to anatomical causes such as unequal growth rates, trauma, infection, congenital anomalies and degeneration. This structural malalignment is common in prolonged cases of LLI that affect muscular pull and the amount of weight borne by the joints. The body can tolerate such oddities for a short period of time, but when weight and pull fall abnormally on the musculoskeletal system, serious and often subtle consequences can occur. The body's adaptation sources become exhausted and routine movements require great effort. Endurance is reduced and body stress increases. This stress often is transmitted to the ligaments; creating a cycle of misalignment, muscle fatigue and ligament stress.

Chiropractic studies within the past several years have identified various signs and symptoms that accompany LLI. Klein noted predisposition to knee injuries in high-school athletes with LLI. He found that the ankle on the side of the LLI commonly experienced excessive pronation (flat foot; loss in medial longitudinal arch) as the foot was planted on the ground, forcing the foot outward and causing excessive tibial rotation. A negative effect occurs on oxygen consumption. Subsequent studies have shown that shoe lifts improve this oxygen consumption.

Once a patient with a structural short leg has been identified by examination, effective treatment can be provided. After orthotic support is provided for foot pronation or knee rotation, patients with a true anatomical leg-length discrepancy will need to be provided with an appropriate heel lift.

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