BETTER Golf THROUGH TECHNOLOGY

The Effect of Frame Asymmetries on Spine Rotation

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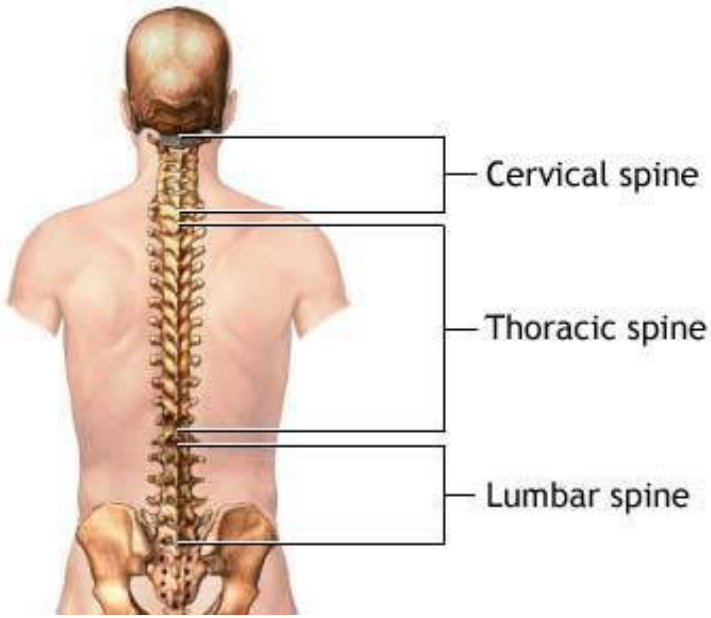


Overview

- A set of bullets summarizing the research at a high level
- Clinical Retrospective Study of the effect of muscle and boney imbalances in the pelvis on the biomechanics of spine rotation.
- Studied and measure 50 consecutive golf clients in the clinic for pelvic girdle asymmetry, and chest rotation.
- Applied standard Body Balance for Performance Approach to treatment for pelvic girdle using the 3R Approach™ to golf performance training.
- Retested pelvic girdle alignment and spine rotation.
- We are trying to prove to the golf community that golf fitness begins with proper frame alignment and posture as promotes correct biomechanics of the spine.
- We believe that this information will assist teachers in understanding why students struggle to make effective and permanent changes to their golf spine motions as the problems are founded in the biomechanics of the human body.

Hypothesis and Goals

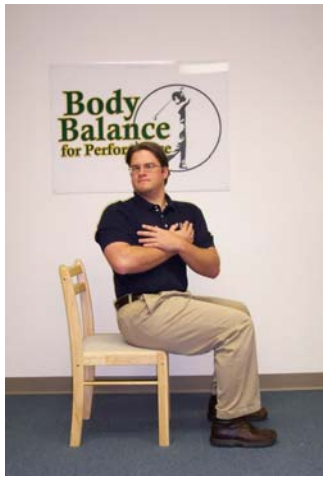
- Frame Asymmetries in the human pelvis cause functional biomechanical changes in the spine. Improving pelvic girdle alignment alignment will result in increased spine rotation. This in turn will lead to improved rotation in the golf swing.
- It is well documented in the medical literature that pelvic girdle asymmetries are related to abnormal spinal curves called scoliosis. This is lateral flexion of the spine.
- According to Fryette's Laws of spinal biomechanics when the spine is postured in side bending it leads to resting rotation in the opposite direction and limited rotation to the same side as the side bending.
- White and Panjabii, in Clinical Biomechanics of the spine further confim this data.
- It is our hypothesis that open shoulders at address and many of the back swing problems that are observed in the golf motion are related to this phenomenon described in the literature.

Method

- 50 consecutive clients at the Body Balance for Performance, Inc National Headquarters were included in the study.
- We measured pelvic girdle alignment in the standard manner described in the physical therapy literature
  - For the pelvic girdle, the boney landmarks of the ASIS and PSIS were measured for alignment by palpation and visualization techniques by the same clinician. Alignment was recorded on the initial client data sheet.
  - For spine rotation standard goniometric testing method was employed by the same clinical for all subjects. All Goniometric measures were recorded on the initial client data sheet.
  - All pretreatment and post treatment testing was performed by the same clinician.

Elevated Pelvis Left

Limited Spine Rotation

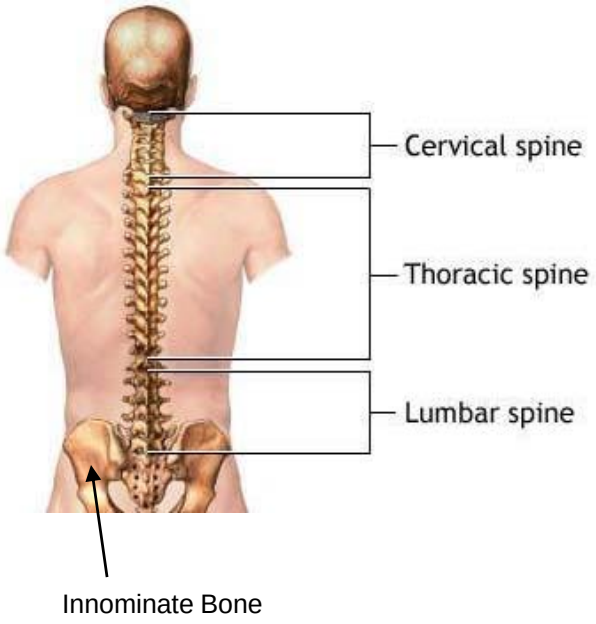


Method

- All data were collected during the initial performance assessment an at the conclusion of the pelvic alignment training and treatment sessions for each subject.
- The measurements recorded were directly related to our hypothesis about spine rotation and pelvic girdle asymmetries as these were the variables we decided to test.

Results/Analysis

- Summary of the data
  - Pelvic Alignment
    - 45 participants had a high right innominate bone
    - 3 participant had a high left innominate bone
    - 2 participants had a level pelvis.
  - Spine rotation
    - The average spine rotation in the participants who had a high right innominate bone was 45 degrees right and 65 degrees left
    - The average spine rotation in participants who had a high left innominate bone was 40 degrees left and 62 degrees right
    - The average spine rotation in the participant who had a level pelvis was 60 degrees left and 63 degrees right.



- Interpretation of the Data
  - The data showed that 90% of the participants had a high right pelvic bone, 5% had a high left pelvic bone and 5% were level.
  - The data showed that when there was an elevated pelvic bone, rotation was more limited on the side that was high.
  - The data showed that 95% of the clients who received the standard Body Balance for Performance treatment of the pelvic asymmetry increased spine rotation on the more limited side by 35% and on the opposite side by nearly 15%
  - 95% of our participants had some degree of pelvic girdle asymmetry and asymmetrical spine rotation.

Conclusions

- Based on the data which is in agreement with the epidemiological studies in the medical community, there is a relationship between frame asymmetry and spine rotation.

- This has implications in golf instruction as it is safe to assume that 95% of golfers have a frame asymmetry and as a result have impaired spinal biomechanics and subsequently impaired shoulder rotation in the golf swing.

- Finally, with proper treatment of the cause of the frame asymmetry, the spinal biomechanics and subsequently spine rotation can be improved.

Future Studies or Research Plan

- We have incorporated the Body Motion System into our organization nationwide and plan to look at the issue of frame asymmetry on the swing motion now that we can easily and reliably make those measurements.