

# **Forced Lordosis in the Lateral Decubitus Position for Surgical Sagittal Reconstruction: A Radiographic Study**

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**INTRODUCTION:** Lateral lumbar interbody fusions have gained popularity. Patients are positioned in the right lateral decubitus position as it is the safest way to access the spine with decreased risk of injury to major vascular structures. Additionally, the lateral position aids in gravity induced retraction of the peritoneal contents. Furthermore, by operating in a lateral position surgeons can utilize a single position to access the anterior and posterior spine. The described positioning for LLIF requires taping the patient to the table with an axillary roll and optional bolster under the right flank. Scarce, if any, literature exists as to positioning the patient more securely or correct/reduce spinal deformities or fractures prior to making an incision or instrumenting the spine. The purpose of this study is to describe a technique that holds the patient in a secured manner and to correct sagittal plane deformities prior to making an incision. The hypothesis of this radiographic study is that forced lordosis can restore innate lumbar lordosis better than conventional surgical positioning (that without forced lordosis).

**METHODS:** Healthy volunteers, aged 21 to 60 years old, were recruited. Exclusion criteria included skeletal immaturity, pregnancy, history of spinal deformity, previous injury to the lumbar spine that required treatment, or previous spine surgery. Informed consent was obtained from each participant. Patients underwent three different lumbar radiographs: 1) standing lateral which served as the patient's base line lordosis; 2) lateral view in the right lateral decubitus position; and 3) lateral view in the right lateral decubitus position with forced lordosis. Forced lordosis was accomplished by extending the hips with a posteriorly directed force on the anterior thigh approximately 4 inches above the superior aspect of the patella, a posteriorly directed force on the lower sternum, and an anteriorly directed counter force at the apex of the sacrum.

## **RESULTS:**

Twelve patients (6 males and 6 females) participated in this study with an average age of 29 years. The average angle of lordosis for standing radiographs was 46.25 degrees. The average angle of lordosis in the unsupported lateral decubitus was 37.88, and the average angle in forced lordotic position was found to be 45.72. Paired two-tailed t-tests were then used to evaluate the three sets of data. When compared to standing lordosis, the angle of lordosis in an unsupported lateral decubitus position varied significantly ( $p=0.00022$ ), and the mean of the differences was found to be 8.8 (CI = [4.96, 11.78]). However, positioning the patient in forced lordosis did not result in a significant difference in angle of lordosis when compared to the angle of standing lordosis ( $p = 0.7634$ ), and the mean of the differences was 0.533 (CI = [-3.27, 4.34]).

**DISCUSSION AND CONCLUSION:** Positioning a patient in unsupported lateral decubitus position results in a decreased amount of lordosis compared to a patient's natural standing position. This relative loss of lordosis is recovered through forced lordotic positioning.