

# Health Impact Comparison of Cervical Sagittal Deformity and Thoracolumbar Sagittal Deformity on Baseline Disability and Surgical Outcomes: Cervical PSO Versus Lumbar PSO

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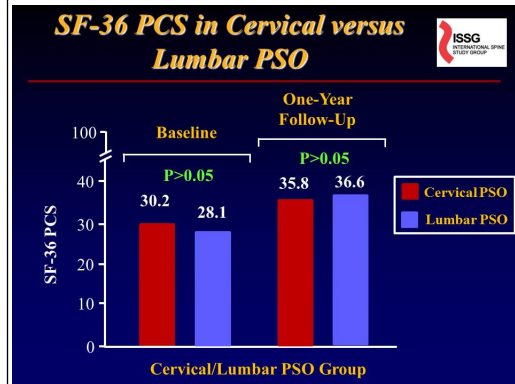
## Introduction

Thoracolumbar sagittal deformity (TLSD) has significant impact on general health status (SF-36). SF-36 scores for adult deformity patients are similar to those of patients with coronary artery disease and cancer. Studies have demonstrated that cervical sagittal deformity (CSD) has significant impact on general health status; however, the health impact of primary CSD has not been compared to thoracolumbar sagittal deformity (TLSD). The goal of this study was to compare baseline and postoperative general health for patients with primary CSD versus TLSD.

## Methods

A retrospective review of a cervical pedicle subtraction osteotomy (PSO) database of CSD was compared to a prospectively collected TLSD database (363 patients) to identify a matched combined cohort of 19 patients based on age, sagittal deformity, 3-column osteotomy, and minimum 1-year follow-up. Patients with concomitant TLSD were excluded from the CSD group and patients with concomitant CSD were excluded from the TLSD group.

Figure 1

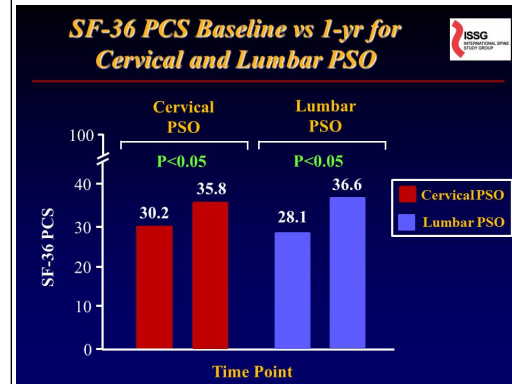


Baseline and 1 year comparison of PCS for cervical and lumbar PSO

## Results

The average age was 70yrs in the CSD group and 63 in the TLSD group ( $p > .05$ ). Average c2-c7 sagittal vertical axis (SVA) was 7.9cm in the cervical group and average c7-S1 SVA was 8.1cm in the TLSD group. Both groups demonstrated improved sagittal alignment post-op (c2-c7 3.4cm, C7-S1 SVA 1.7cm). Baseline SF36-PCS was not statistically different (30.2 vs 28.1;  $p > 0.05$ ; **Figure 1**). At 1-year follow-up both groups showed statistically significant improvement in SF36-PCS, reaching minimal clinically important difference (CSD 30.2 to 35.8 vs TLSD 28.1 to 36.6, both  $p < 0.05$ ; **Figure 2**). Regional pain improved significantly in each group. Neck pain improved from NRS 8.1 to 3.9 ( $p < 0.05$ ). Back pain improved from NRS 7.9 to 3.3 ( $p < 0.05$ ). A case example of a cervical PSO is illustrated in **Figure 3**.

Figure 2



Baseline vs 1year PCS scores for cervical and lumbar PSO

## Conclusions

The impact of CSD and TLSD on general health status is comparable for similar preoperative sagittal malalignment and age. Surgical correction with 3-column osteotomy demonstrates similar efficacy in improving general health status and regional pain for both primary CSD and TLSD.

## Learning Objectives

By the conclusion of this session, participants should be able to: (1) Appreciate that both thoracolumbar sagittal deformity and cervical sagittal deformity have substantial negative impact on standardized measure of general health status (SF-36); (2) Appreciate that corrections of thoracolumbar and cervical sagittal deformities with 3-column spinal osteotomies offer substantial and similar degrees of improvement in general health status.

Figure 3



Cervical PSO case example. Posterior spinal fusion with instrumentation from C2-T3, C6-T1 laminectomy, C7 pedicle subtraction osteotomy, rod placement, and correction of deformity