

Scoliotic Deformity Correction in 107 Patients Undergoing Single-Level Minimally Invasive Transforaminal Lumbar Interbody Fusion

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Introduction

There exists substantial evidence to support lumbar fusion procedures in cases of spondylolysis, spondylolisthesis, and in other cases of sagittal deformity. However, coronal scoliotic deformity can also be a cause of low back and leg pain in a certain subset of patients.

Methods

350 patients who underwent MITLIF were followed for 7 consecutive years. This was pared down to 107 patients who had preoperative and postoperative radiographs that exhibited a clear coronal deformity that correlated with the patient's symptomatology. Dynamic radiographs were analyzed using a three-point angle measurement tool through EasyViz viewer program. Cobb angles were recorded preoperatively and postoperatively along with a validated full set of Health-related Quality of Life (HRQL) Measures, including Visual Analog Scale, Oswestry Disability Index, and SF-36.

Results

66 females and 41 males were treated (average age 68.6, range 39 - 92). Levels fused included L1-L2 (n = 1, 1%), L2-L3 (n = 10, 9.3%), L3-L4 (n = 16, 15%), L4-L5 (n = 75, 70%), L5-S1 (n = 1, 1%), or multi-level fusion (n = 4, 3.7%). Average Cobb angle decreased from 9.47 preoperatively to 7.54 postoperatively ($p < 0.05$). Cobb angles ranged from 0.7% - 43.2% preoperatively, and 0.7% - 34.1% postoperatively. There was a statistically significant correlation between Cobb angle improvement and HRQL measure improvement. Patients also exhibited an age related trend, with average Cobb angles increasing as the patient ages.

Conclusions

Cobb angles improved after MITLIF in 94% (n = 101) of patients and this improvement correlated with an improvement on symptom questionnaires. MITLIF resulted in a high rate of spinal fusion, and a low rate of reoperation. Cobb angles were reduced 21% on average with just a single-level fusion, supporting the consideration of a focused single-level fusion versus a large multilevel fusion in cases of coronal deformity, especially in the elderly.

Learning Objectives

By the conclusion of this session, participants should be able to:

- 1) Describe the importance and utilization of Cobb Angle in the evaluation of MIS-TLIF and correction of coronal scoliotic deformity
- 2) Discuss, in small groups the correlation between improvement of Cobb angle in coronal scoliotic deformity to health care quality of life measures
- 3.) Identify an effective treatment for adult scoliotic deformity in symptomatic patients with coronal deformity

References