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Short Segment Minimally Invasive Anterolateral Interbody Fusion for Adult Degenerative Scoliosis Correction – Early Experience

Yi Lu MD, PhD; Timothy R. Smith MD PhD MPH
Department of Neurosurgery
Brigham & Women's Hospital

Introduction

Adult degenerative scoliosis has different pathophysiology, presentations and treatment strategies, when compared to idiopathic scoliosis. Adult degenerative scoliosis is frequently focal over a limited lumbar span. Traditional scoliosis correction strategy involves a variety of osteotomy techniques, which necessitate a long segment instrumented stabilization, commonly from low thoracic level to the pelvis. These long constructs are indicated because bone removal techniques are inherently destabilizing. Albeit effective and durable, these traditional methods carry significant surgical morbidity, high complication rates, long recovery time, loss of significant spinal flexibility and compensatory mechanisms, and risk of adjacent segment failure. Newer anterolateral interbody techniques provide powerful scoliosis correction without iatrogenic spinal destabilization, and allow short segment scoliosis correction in patients with focal degenerative scoliosis.

Methods

A continuous series of 12 adult degenerative scolioswas cases utilizing short segment (1-3 segments) anterolateral interbody fusion and posterior pecutaneous pedicle screws was analyzed. Early three months follow up results are presented.

Results

Average age was 65.8 years old (range 53 - 80 years). 41.7% of patients were male, and the mean fusion length was 1.5 segments (range from 1 to 3 segments). The mean VAS score before the surgery was 7.8. At one month and three months post-op, mean VAS score was 3.1 and 1.5, respectively. 90% of patients were narcotic free at 3 months after surgery. The mean Pre-operative Cobb angle was 19.3 degrees over an average of 3.8 lumbar segments. Mean post-op Cobb angle was 8.7 degrees. The mean increase in lumbar lordosis was from 46.5 to 51.2 degrees. PI/LL mismatch decreased from 10.6 to 3.7 degrees. The mean operated disc height per level increased from 0.5 cm before surgery to 1.3 cm after surgery. The mean estimated blood loss (EBL) was 290 cc per case.

Conclusions

For certain adult degenerative scoliosis patients , newer anterolateral interbody techniques allow effective scoliosis correction and symptomatic relief with short segment fusion. This could provide an effective alternative treatment strategy to more traditional long segment fusion for adult degenerative scoliosis, allowing significant decrease in surgical morbidity. Long term follow-up is needed to assess the durability of anterolateral techniques.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Recognize the differences in pathophysiology, presentations and treatments between the adult degenerative scoliosis and adolescent idiopathic scoliosis. 2) Describes the anterolateral approach for adult degenerative scoliosis correction. 3) Recognize the rational that why anterolateral approach allows short segment fusion for adult degenerative scoliosis correction. 4) Describe the benefit of using the minimally invasive anterolateral interbody fusion for adult degenerative scoliosis correction.