

Abstract: 390

Changes in Coronal and Sagittal Plane Alignment after XLIF Procedure in the Treatment of Degenerative Scoliosis

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Summary: The traditional treatments to degenerative scoliosis consist in open surgeries, with high incidence of morbidity. Here we present a lateral retroperitoneal minimally invasive approach for the treatment of adult scoliosis.

Background context: Symptomatic adult scoliosis deformity presents as a difficult problem to solve. Traditional treatments include anterior and posterior open approaches. The purpose of this paper is to present a lateral retroperitoneal minimally invasive approach (eXtreme Lateral Interbody Fusion - XLIF) for the treatment of adult scoliosis requiring more than four levels of arthrodesis without the morbidity of an open procedure.

Methods: A prospective, non-randomized, single center study with 14 patients, mean age 69.64 (51-87 years) with two year follow up. Lateral, A-P, flexion-extension X-rays, neurological examination and clinical outcome assessments using Oswestry and VAS scores were performed at the preoperative, 1, 6 week, 3, 6, 12 and 24 months postoperative intervals. The extreme lateral approach was done through the retroperitoneal space and through psoas muscle avoiding vascular lesions. A partial discectomy was done and the end-plate cleaned preserving ALL, keeping the spine more stable than the traditional anterior surgery. The operated levels ranged from four to seven levels, including T10-T11 to L4-L5.

Results: The procedures were performed without complication in an average 121 minutes and with less than 50cc blood loss. Ten patients had four levels of fusion; two patients had five levels and two patients with seven levels of arthrodesis. VAS pain scores improved from an average 8.33 at pre-op to 3.16 at 2 years, standard deviation 1.49 and 1.06 respectively. Oswestry scores improved from an average 51.2 at pre-op to 27.33 at 2 years with standard deviation of 13.42 and 13.09 respectively. Coronal and sagittal alignments improved from average Cobb angles of 16.4 degrees at pre-op and 7.8 degrees at 2 years, and average lordosis angles of 17.1 degrees at pre-op to 37.4 degrees at 2 years.

Conclusions: Using the XLIF approach we were able to treat long thoracolumbar deformities in a minimally invasive way targeting the pain improvement after surgery without the risks and morbidity associated with big corrections. Our intent was pain improvement and stabilization. We found reasonable coronal and sagittal correction in addition to successful clinical improvements in pain and function in long thoracolumbar reconstructions.