

Proximal Fusion Constructs in MIS Scoliosis Surgery are Successful without Interbody or Intertransverse Fusion

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Introduction

Minimally invasive techniques are increasingly utilized in adult deformity surgery as surgeon familiarity improves and long-term data is published. Concerns raised in such cases include pseudoarthrosis at levels where interbody grafts are not utilized. Previous studies have not specifically examined the status of the rostral aspect of the surgical construct, which is commonly instrumented without interbody or intertransverse fusion.

Methods

A retrospective analysis was performed on all patients who underwent minimally invasive deformity corrections in two academic spine centers over a ten-year period. Inclusion criteria were at least 2 rostral levels instrumented percutaneously ranging from T8-L2 as upper end of the construct. Fusion assessment was made using computed tomography when possible or dynamic radiographs. Common radiographic parameters and clinical variables were assessed pre and post operatively.

Results

A total of 34 patients fit inclusion criteria. Baseline characteristics included: M:F 14:20, average age of 65.1 years, and BMI 30.2. The number of levels fused on average was 7.4 with an average of 3.4 instrumented percutaneously between T8 and L2, representing a total of 115 rostral levels instrumented percutaneously. Fusion assessment was performed using CT in 70 levels and radiographs in 45 levels. Among the 115 rostral levels instrumented percutaneously robust fusion was seen in 20 (17.4%) with 49 (42.6%) exhibiting some evidence of fusion. Pseudoarthrosis was seen in 2 (1.7%) of rostral segments. There were no instances of proximal hardware revision. The number of patients with radiographic PJK was 11 (32.4%). Follow-up imaging was obtained at a mean of 26.7 months. Patients experienced improvements in ODI and VAS comparable to published series.

Conclusions

In the present series of adult scoliosis patients undergoing thoracolumbar deformity correction, rostral segments instrumented percutaneously have a very low rate of pseudoarthrosis (less than 2%) with clear evidence of fusion occurring in >60% of patients.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Recognize that percutaneous instrumentation techniques can provide acceptable fusion with very low rates of non-union when employed in scoliosis surgery, 2) Discuss in small groups some of the common reasons for rostral failure of long segment fusions in scoliosis surgery, 3) Describe the incidence and importance of successful fusion at the upper segments in a thoracolumbar scoliosis construct.

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