

Rate of Instrumentation Stability Changes on Post-Operative and Follow-Up Films After Primary Complex Spinal Fusion (≥ 5 Levels) for Adult Deformity Correction: A Single Institutional Study of 136 Patients

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Introduction

Recently, there has been an excessive use of post-operative imaging after spine surgery and has been a target for hospitals to reduce unnecessary costs. However, there is a paucity of data identifying the rate of instrumentation stability changes after complex spinal surgery involving ≥ 5 level fusions.

Methods

The medical records of 136 adult (≥ 18 years-old) spine deformity patients undergoing elective, primary complex spinal fusion (≥ 5 levels) for deformity correction a major academic institution from 2005 to 2015 were reviewed. Patient demographics, comorbidities, intra- and post-operative complication rates were collected for each patient. We reviewed the first five subsequent post-operative and follow-up images, and whether revision of surgery was performed within five years after surgery. The primary outcome investigated in this study was the rate of instability on follow-up imaging.

Learning Objectives

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

- 1) Describe the importance of post-operative images after complex spine surgery,
- 2) Discuss, in small groups, the clinical necessity of multiple post-operative images,
- 3) Identify an effective time length between discharge and follow up that best demonstrates stability of instrumentation.

Results

The majority of patients were female, with the mean \pm SD age of 53.8 ± 20.0 years and BMI of 27.3 ± 6.2 kg/m². The median [IQR] fusion levels operated was 9 [7-13], with a mean \pm SD length of surgery of 327.8 ± 124.7 mins and estimated blood loss of 1312.1 ± 1269.2 mL. The mean \pm SD length of hospital stay was 6.6 ± 3.9 days with a 30-day readmission rate of 14.0%. Post-Operative and follow-up change in stability on imaging (days from operation) included: Image 1 (4.6 ± 9.3 days) 0.0%; Image 2 (51.7 ± 49.9 days) 3.0%; Image 3 (142.1 ± 179.8 days) 5.6%; Image 4 (277.3 ± 272.5 days); and Image 5 (463.1 ± 525.9 days) 15.7%. The third-year after surgery had the highest rate of hardware revision (5.55%), followed by the second-year (4.68%), and first-year (4.54).

Conclusions

Our study suggests that the rate of instrumentation stability changes on imaging increases overtime, with no changes occurring at the first post-operative image. In an era of cost-conscious healthcare, reduction of early imaging after complex spinal fusions (≥ 5 levels) may not impact patient care and can reduce overall healthcare resources.