

If Not Now, When? A Comparative Analysis of Early-Term Versus Late-Term Complication Rates following Adult Spinal Deformity Surgery

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INTRODUCTION:

Adult spinal deformity (ASD) corrective surgery is often a highly invasive procedure portending patients to both immediate and long-term complications. The purpose of this study is to compare rates of certain complications by and after two years following ASD surgery.

METHODS:

ASD patients with minimum 3-year and up to 5-year data were included. Complication groups were defined as follows: 1) any complication, 2) major, 3) medical, 4) mechanical, 5) radiographic, and 6) reoperation. Complications were stratified by occurrence *Before* or *After* two years (2Y) postoperatively. Multivariable logistic regression analysis adjusting for age and invasiveness determined likelihood of the occurrence for certain complications for those suffering a major complication or undergoing reoperation *Before* or *After* 2Y.

RESULTS:

A total of 481 patients included (average age: 59±15 years, 77% female, CCI: 1.7±1.7). *Before* 2Y, complication rates: 74% ≥1 complication, 19% major, 17% medical, 13% neurological, 46% radiographic, 15% mechanical, 20% required reoperation. *After* 2Y, complication rates: 19% ≥1 complication, 3% major, 1% neurological, 17% radiographic, 3% mechanical, 1.5% required reoperation. Radiographic and mechanical complications had the highest proportions *After* 2Y at 23% and 18%, respectively. This translated to 75% of all complications occurring *After* 2Y to be mechanical- or radiographic-related. The cause of major complication *After* 2Y was more likely mechanical (OR: 148, [37-598]; p<.001), in addition to the indication for reoperation *After* 2Y (OR: 51, [10-255]; p<.001). Patients suffering a radiographic complication *After* 2Y were less likely to have suffered a radiographic complication *Before* 2Y (OR: 5, p<.001). Patients suffering a major complication or reoperation *Before* 2Y were not more likely to develop any certain complication *After* 2Y (all p>.05). Patients developing a major complication *After* 2Y had higher rates of each complication *Before* 2Y (all p<.05), but those undergoing reoperation *After* 2Y were only predicted by PJF (OR: 6, [1.1-37.1]) *Before* 2Y.

DISCUSSION AND CONCLUSION:

Mechanical and radiographic complications occur three times more often than any other complications after two years following adult spinal deformity correction. This study increases our understanding of complications occurring later in the postoperative course to better aid the spine deformity surgeon during postoperative monitoring and management.

Table 1. Overall Complication Rates Before and After Two Years

Complication	Before Two Years	After Two Years	After Two Years Rate / Total Rate
Any Complication	73.6%	19.3%	25%
Major	19.3%	2.7%	13%
Medical	16.8%	0.4%	2%
Cardiopulmonary	10.4%	0.2%	2%
Gastrointestinal	6.0%	0.0%	0%
Renal	0.2%	0.0%	0%
Neurological	13.1%	1.2%	9%
Infection	6.0%	0.4%	7%
Mechanical	15.4%	3.3%	18%
Radiographic	46.2%	16.5%	23%
PJK	36.6%	12.9%	26%
PJF	7.9%	5.2%	40%
Reoperation	19.8%	1.5%	22.1%