

Comparison of Pulmonary Function in Adults Younger and Older than age 60 Undergoing Spinal Deformity Surgery

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Learning Objectives

By the conclusion of this session, participants should be able to: 1) Describe pulmonary function test) Discuss, the difference in PFTs in young versus old patients following spinal deformity surgery

Introduction

The objective of this study was to determine differences in pulmonary function in adult patients who are either younger (Y) or older (O) than age 60 following spinal deformity surgery. We hypothesize that older age may further exacerbate impairment of pulmonary function following spinal deformity surgery.

Methods

128 consecutive adult deformity patients with idiopathic scoliosis undergoing surgical treatment were evaluated at a single institution with minimum 2 year follow-up. Prospectively collected PFTs, clinical records and radiographs were analyzed.

	Young (<60)	Old (≥60)
# of Patients	102	26
Average Age (yrs)	39.3 ± 14.1	63.7 ± 2.7
Average F/U (yrs)	2.9	2.6
Males	9	0
Females	93	26
Non-smokers	88	22
Previous smoker	10	4
Current smoker	4	0

Results

There were 102 patients in Y group (avg age 39.3+14.1 yrs) and 26 in O group (avg age 63.7+2.7 yrs), with similar F/U (Y=2.9 v O=2.6 yrs, p=0.27). There were no differences in average preop main thoracic (MT) curve magnitude (Y=50.0deg, O=54.8deg, p=0.27), however O patients had significantly greater # of lumbar (5.9 v 4.2, p=0.00), thoracic (9.1 v 7.3, p=0.00), and total (15.0 v 11.5, p=0.00) levels fused. We also found O patients had significantly lower absolute pre-op FEV1 (2.1 v 2.6L, p=0.02) and FVC (2.7 v 3.3L, p=0.05), but no differences in %pred PFTs. This relationship remained at 2 yrs, with lower absolute FEV1 (1.9 v 2.5L, p=0.00) and FVC (2.5 v 3.1L, p=0.00). A clinically significant decline in PFTs (greater than 10% pred FEV1) occurred in 8 (31%) O patients and 26 (25%) Y patients, which was not statistically different. (p=0.63). We also observed pre-op PFT impairment (less than 65%pred FEV1) in 1 (4%) O patient, which significantly increased to 6 (23%; p=0.02) O patients postoperatively, compared to Y group experiencing no change in the number of patients (n=12, 12%) with PFT impairment postoperatively.

	Young (<60)	Old (≥60)	p-value
Clin Sig. Decline PFTs	8 (31%)	26 (25%)	0.63
PFT Impairment			
Pre-op	12 (12%)	1 (4%)	0.23
2-year Post-op	12 (12%)	6 (23%)	0.14

	Young (<60)	Old (≥60)	p-value
Pre-Op PFTs			
Absolute FEV1 (L)	2.6	2.1	0.02*
Absolute FVC (L)	3.3	2.7	0.05*
% Pred FEV1	89.9%	87.6%	0.57
% Pred FVC	93.3%	90.5%	0.49
2-Year PFTs			
Absolute FEV1	2.5	1.9	0.00*
Absolute FVC	3.1	2.5	0.00*
% Pred FEV1	85.3%	81.1%	0.46
% Pred FVC	88.3%	84.6%	0.49

Conclusions

Despite age related reduction in PFTs, older patients (over age 60) had no significant difference in %pred PFTs compared to younger patients following spinal deformity surgery. We found older patients have no significant difference in %predicted PFTs compared to younger patients postoperatively, and no differences in the rate of clinically significant PFT decline (=10% pred FEV1). However, older patients more frequently (23% v 12%) experience PFT impairment (<65%pred FEV1) after spinal deformity surgery.

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