Optimizing Spinal Deformity Surgery: Does a Dual Approach Help Young Surgeons?

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INTRODUCTION:

The utility of having two attendings in pediatric spinal deformity surgery has been debated. Although studies have shown two attendings have better curve correction, pain, and recovery time, there is conflicting evidence on operative time, blood loss, infection rate, and hospital length of stay. Furthermore, limited literature examines the impact of surgeon experience on the value of a dual approach. Therefore, we sought to evaluate the performance of two young orthopaedic attending surgeons working as a team compared to an established senior level orthopaedic attending surgeon in adolescent idiopathic scoliosis (AIS) surgery.

METHODS:

We performed a therapeutic retrospective cohort study of patients with AIS undergoing posterior spinal fusion by either a single or dual attending approach. The dual attendings were within their first decade of practice and the single attending had been practicing for several decades with a busy, established, academic spinal deformity practice. A 1:1 propensity score match was performed between the two cohorts with the variables of age at surgery, sex, body mass index, Cobb angle, and number of levels fused. Perioperative and postoperative outcomes between the groups were analyzed.

RESULTS:

There were 24 patients in each cohort. Patients having surgery by dual attendings had a shorter mean operative time overall (232 vs. 327 minutes, $p<0.001$) and shorter mean operative time per levels fused (19 vs. 26 minutes per level, $p<0.001$). Additionally, they had a better percent curve correction (70% vs. 56%, $p=0.001$) and a smaller overall final postoperative curve magnitude (17° vs. 25°, $p<0.001$). Estimated blood loss was lower in the dual attending cases (421 vs. 989 mL, $p=0.023$), as well as cell saver volume transfused (59 vs. 178 mL, $p<0.001$). Dual attending patients also had a shorter length of stay (3 vs. 4 days, $p<0.001$). Dual attending cases had more pedicle screws placed per surgery (17 vs 12 screws, $p=0.004$). There were no differences in hemovac blood loss, blood product transfusion requirements, need for the pediatric intensive care unit, or perioperative or postoperative complications. When examining dual attending surgeries over time (as they gained experience), there was an improvement in hospital length of stay (R: -0.617, $p=0.001$) and hemovac blood loss (R: -0.474, $p=0.019$).

DISCUSSION AND CONCLUSION:

Dual attending surgery in AIS is safe and effective when conducted by two young orthopaedic surgeons. When compared to a senior, experienced solo surgeon, dual attendings performed better in terms of operative time, blood loss, curve correction, and time to discharge with no difference in complication rates. Young spinal deformity surgeons should consider a team-based approach to their cases, allowing them to provide effective care compared to senior colleagues.

Table 1. Perioperative and postoperative characteristics between the dual young attending and one senior attending cohorts.

	Dual Young Attendings	One Senior Attending	P-value
Length of stay (days)	3.33 (±0.64)	4.25 (±0.61)	**<0.001**
Use of hooks			**0.003**
Yes	22	13	
No	2	11	
Number of screws	17.00 (±2.47)	11.83 (±7.58)	**0.004**
Estimated blood loss (mL)	420.83 (±294.95)	988.75 (±1149.95)	**0.023**
Hemovac blood loss (mL)	503.46 (±417.16)	586.46 (±248.45)	0.407
Cell saver (mL)	58.75 (±82.58)	177.88 (±115.22)	**<0.001**
pRBC transfused (units)	0.42 (±0.88)	0.71 (+1.49)	0.413
FFP transfused (units)	0.21 (±1.02)	0.17 (±0.82)	0.877
Platelets transfused (units)	0	0.08 (±0.41)	0.328
Albumin			**0.009**
Yes	17	8	
No	7	16	
Perioperative complications			0.489
Yes	0	2	
No	24	22	
Postoperative complications			1
Yes	1	2	
No	23	22	
PICU			0.489
Yes	0	2	
No	24	22	
Preop HCT	39.80 (±3.34)	41.21 (±2.78)	0.118
Preop Hgb	13.33 (±1.28)	13.80 (±1.21)	0.202
HCT POD1	30.23 (±5.29)	22.23 (±11.14)	**0.004**
Hgb POD1	10.22 (±1.86)	7.26 (±3.51)	**0.001**
HCT POD2	28.20 (±4.51)	25.41 (±8.25)	0.213
Hgb POD2	9.51 (±1.46)	7.31 (±3.50)	**0.01**
HCT POD3	29.05 (±4.80)	24.18 (±9.69)	0.113
Hgb POD3	9.77 (±1.58)	7.34 (±3.31)	**0.023**
Vancomycin powder			**<0.001**
Yes	24	5	
No	0	19	
Operative time (min)	232.46 (±58.54)	327.71 (±92.35)	**<0.001**
Operative time per level fused (min)	19.17 (±3.95)	26.05 (±6.92)	**<0.001**
Final postop curve (°)	16.67 (±7.20)	25.46 (±9.06)	**<0.001**
Percent curve correction (%)	70.46 (±11.83)	55.94 (±17.39)	**0.001**
Final months postop (months)	18.13 (±15.35)	49.42 (±28.76)	**<0.001**