Two Versus One Surgeon for Complex Spine Deformity: A Systematic Review and Meta-analysis.

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Disclosure

• None
Introduction

• Surgical management of spine deformity is challenging and associated with a high risk of complications.

• Several modifiable factors e.g. length of anesthesia, estimated blood loss and length of hospital stay contribute to this high risk of complications.

• Two attending surgeon approach has been inconsistently reported in the literature to have better outcomes for spine deformity.
Methods

• A systematic review and meta-analysis was conducted to assess surgical outcomes following one versus two attending surgeon approach for spine deformity.

• MEDLINE, Embase, Web of Science and Cochrane database were searched till September 3, 2019.

• A total of 9 studies were included in the meta-analysis and Random Effects (RE) model were used to pool the effect estimates.
Results

Estimated Blood Loss: Non-significantly higher in single surgeon group

Forest plot shows difference in means for blood loss in single surgeon vs. dual surgeon group for cohort studies (mean difference = 354.3 mL; 95% CI: -31.5, 740.1; $I^2=0\%$; p-heterogeneity = 0.97; 3 studies) and case series (mean difference = 196.5 mL; 95% CI: -183.8, 576.9; $I^2=88\%$; p-heterogeneity = <0.01; 4 studies) separately in Random Effects (RE) Model. Solid squares represent the point estimate of each study and the diamond represents the pooled estimate of the difference. P-interaction between cohort and case series: 0.57
Operative Time: Statistically significantly higher in single surgeon group

Forest plot shows difference in means for operative times in single surgeon vs. dual surgeon group for cohort studies (mean difference = 94.3 minutes; 95% CI: 54.9, 133.6; $I^2=65.2\%$; $p$-heterogeneity = 0.0.5; 3 studies) and case series (mean difference = 58.7 minutes; 95% CI: 18.4, 99.1; $I^2=85.4\%$; $p$-heterogeneity = <0.01; 4 studies) separately in Random Effects (RE) Model. Solid squares represent the point estimate of each study and the diamond represents the pooled estimate of the difference. P-interaction between cohort and case series: 0.22.
Length of Hospital Stay: Statistically significantly higher in single surgeon group

Forest plot shows difference in means for length of hospital stay in single surgeon vs. dual surgeon group for cohort studies (mean difference = 0.85 day; 95% CI: 0.44, 1.27; I²=0%; p-heterogeneity = 0.61; 3 studies) and case series (mean difference = 0.87 day; 95% CI: 0.37, 1.36; I²=57.5%; p-heterogeneity = 0.07; 4 studies) separately in Random Effects (RE) Model. Solid squares represent the point estimate of each study and the diamond represents the pooled estimate of the difference. P-interaction between cohort and case series: 0.97.
Complications: Statistically significantly higher in single surgeon group

Forest plot for Mantel-Haenszel (MH) risk ratio between single versus two surgeon approach. Forest plot shows MH risk ratio in single surgeon and two surgeon group for cohort (MH risk ratio = 3.66; 95% CI: 1.03, 12.9; I^2=0%; p-heterogeneity = 0.97; 3 studies) and case series (MH risk ratio = 2.29; 95% CI: 1.30, 4.02; I^2=55.4%; p-heterogeneity = 0.10; 3 studies) separately in Random Effects (RE) Model. Solid squares represent the point estimate of each study and the diamond represents the pooled estimate of the ratio. P-interaction between cohort and case series: 0.51
Conclusion

• Two attending surgeon approach appears to be associated with reduced operative time, shorter hospital stays and reduced risk of complications.

• Surgeons should consider involving an additional surgeon in deformity cases with a high risk of peri-operative complications.

• These findings can potentially improve outcomes in surgical treatment of spine deformity.