

Hemorrhage Patterns and Operative Characteristics in Single Port and Multi Port Transoral Robotic Surgery for Upper Airway Disease

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Objective: Robotic approaches are now routine in upper airway surgery, yet the practical differences between the single port platform and earlier multi port systems remain only partly understood.

Methods: We reviewed 126 consecutive patients treated with robotic upper airway procedures over a ten year period and compared perioperative features and postoperative hemorrhage across the Si, Xi, and single port systems. Surgical extent was classified as single level or multi level, and a matched cohort of multi level cases (n = 21 per platform) was created to reduce baseline differences.

Results: Across the entire series, major postoperative bleeding occurred in 9.5% of patients. Multi level operations generally involved longer operative times, greater postoperative discomfort, and longer hospitalization. In the unmatched cohort, multilevel operations performed with the Si and Xi platforms showed a higher incidence of major hemorrhage. The single port cohort showed a lower overall bleeding rate (3.1%), with no major events in single level procedures and one event (4.8%) in multi level surgery. Within the matched multi level cohort, the single port system demonstrated fewer major bleeding events than the Xi platform (4.8% vs. 28.6%). A hierarchical logistic regression model incorporating demographics, surgical extent, and robotic platform indicated that use of the single port system contributed meaningfully to predicting reduced hemorrhage risk ($R^2 = 0.18$, Model $p = 0.02$).

Conclusion: Taken together, our results indicate that the single port platform may provide a margin of safety in demanding upper airway procedures, especially when several anatomical sites are addressed in the same session. Confirmation of this pattern will require prospective evaluation.

中文題目：單孔與多孔經口機器人手術治療上呼吸道疾病之術後出血與手術結果比較

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