Title: National Trends in Surgery for Sinonasal Malignancy and the Effect of Hospital Volume on Short Term Outcomes

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Objective/Hypothesis: Sinonasal carcinomas are a collection of highly morbid neoplasms originating from the nasopharynx and sinuses. Over the last two decades, an aggressive combination of surgery, radiation, and chemotherapy has been used to treat sinonasal malignancies. We sought to characterize the trends in initial management of sinonasal malignancy and the impact on hospital volume on the surgical care and outcomes.

Study Design: Retrospective cross-sectional study.

Methods: We performed a retrospective cohort study with times trends of patients admitted for surgical resection of sinonasal malignancy in the National Inpatient Sample (NIS) between 1988 and 2009. Subset analysis was performed on patient cohorts with skull base involvement, orbit or maxillary involvement, or requiring radical neck dissection. Patient characteristics as well as hospital attributes were correlated with patient morbidity and mortality.

Results: Over the course of 22 years, we identified 3850 cases of sinonasal surgery patients from 879 hospitals. 14.9% of patients had complications and 0.8% of hospitalizations resulted in mortality. Cardiopulmonary complications, including pulmonary collapse and myocardial infarctions, and infectious causes, most commonly urinary tract infections and site infection, accounted for 41.5% and 25.7% respectively of all complications. Hemorrhagic complications requiring transfusion were also present in 16.1% of cases with complications.

Cases requiring neck dissection, had orbital or maxillary sinus involvement, or had skull base involvement had higher rates of morbidity and mortality. 24.4% of such high risk surgeries had complications, compared to 11.3% of cases without such extranasal involvement. We identified 32 hospitals which averaged more than 5 cases per year and accounted for 28% (1097) of all sinonasal surgery cases. These hospitals were more represented in high risk cases – accounting for 32.4% of cases requiring neck dissection, 44.9% of cases with orbital involvement, and 45.7% of cases with skull base involvement.

Conclusions: This study reflects changing trends in the epidemiology and primary management of sinonasal cancer. Greater patient age was associated with higher morbidity and mortality. Complicated cases requiring neck dissection, had skull base or orbital involvement had higher rates of complications but were not associated with higher mortality. High volume hospitals were associated with higher complication rates, but this trend was associated with overrepresentation of complicated cases with skull base involvement, orbital involvement, and neck dissection.