Increased 90-Day Readmissions and Complications following Hip Arthroscopy in Centers with Low Surgical Volume in New York State

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INTRODUCTION: Utilization of hip arthroscopic procedures has increased dramatically in New York State (NYS) over the past two decades, yet ease of access to these treatments remains sharply divided along geographic and socioeconomic lines. In addition, surgical centers with higher case volumes may be able to achieve safer outcomes for their operative patients (i.e., fewer readmissions and complications) than centers with fewer cases, but it is unclear whether this relationship holds true for hip arthroscopy procedures or whether the impact of case volume is independent of other demographic and socioeconomic variables. The aims of the present study were to 1) classify surgical centers in New York State by volume of hip arthroscopies performed, 2) calculate rates of readmissions and complications by center volume, and 3) identify socioeconomic predictive factors for readmissions and complications following hip arthroscopy.

METHODS: We conducted a retrospective analysis of patients who underwent hip arthroscopy at NYS healthcare facilities from 2010-2020 using the New York Statewide Planning and Research Cooperative System (SPARCS) inpatient database. Surgical center volumes were classified into three categories: low (<85th percentile), medium (85th-95th percentile), and high (>95th percentile). Demographic variables and incidences of readmissions and complications within 90 days of index surgery were abstracted from SPARCS. Neighborhood socioeconomic status was quantified using the University of Wisconsin School of Medicine and Public Health U.S. Area Deprivation Index (ADI). Readmission and complication rates were compared between the three volume categories. Multivariable logistic regression was used to determine whether center volume and other socioeconomic variables were independent predictors of readmissions and complications.

RESULTS: A total of 50,252 hip arthroscopy patients were identified in SPARCS from 2010-2020. Of these patients, 13,861 (27.6%) underwent surgery at low-volume centers, 11,757 (23.4%) underwent surgery at medium-volume centers, and 24,634 (49.0%) underwent surgery at high-volume centers. Minorities, publicly-insured patients, and patients from lower-status neighborhoods made up a larger proportion of cases seen by low-volume centers compared to high-volume centers ($p < 0.001$). High- and mid-volume centers were concentrated around metropolitan areas while low-volume centers were predominantly found in suburban and rural locations. Patients in the low-volume group experienced significantly higher 90-day rates of readmissions ($p < 0.001$) and all-cause complications ($p < 0.001$) than the medium- and high-volume groups. Furthermore, high-volume centers were independently associated with lower odds of readmission (OR = 0.57, $p < 0.001$) and all-cause complications (OR = 0.68, $p < 0.001$) compared to low-volume centers.

DISCUSSION AND CONCLUSION: Low-volume surgical centers are associated with increased readmission and complication rates following hip arthroscopy, independent of other socioeconomic factors such as age, sex, race, insurance status, and neighborhood socioeconomic status. High-volume hip arthroscopy centers may be more capable than their low-volume counterparts of achieving economies of scale that improve operative efficiency and mitigate the likelihood of adverse postoperative events. However, this may also exacerbate geographic and socioeconomic disparities in surgical access and outcomes among hip arthroscopy patients in NYS.