

Risk of Failure of Primary Hip Arthroscopy: A Population-Based Study

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Disclosures

- **Ryan Degen, MD**
 - **I have no financial relationships to disclose**

Intro

- Background:

- Hip arthroscopy utilization has significantly increased in recent years
 - Studies have reported increases of 300-600% in annual rates in the past 10 years^{1,2,3}
- Large-sample data has demonstrated good to excellent outcomes following hip arthroscopy in the short to mid-term follow-up^{4,5}
- However, hip arthroscopy is a technically challenging procedure with modest complication rates⁶
 - **Minor – 7.5%**
 - (iatrogenic chondral/labral damage, nerve palsy, superficial infection, HO, instrument breakage)
 - **Major – 0.58%**
 - (pulmonary embolism, deep infection, femoral neck fracture, vascular injury, avascular necrosis)
- Presently, there is limited data on the survival of primary hip arthroscopy

Intro

- Purpose:

- To report on the rates of revision hip arthroscopy and conversion to arthroplasty following hip arthroscopy in New York State
- To identify prognostic variables associated with the need for revision surgery, including the impact of procedural volume

- Hypothesis:

- Revision arthroscopy and/or conversion to arthroplasty would occur at a higher rate in older patients and for patients treated by lower-volume surgeons

Methods

- Case Identification

- The Statewide Planning and Research Cooperative System (SPARCS) database was used to identify cases of primary hip arthroscopy between 1998-2012
- Inclusion criteria:
 - Patients identified by CPT Code

Code	Procedure listing
29860	Hip Arthroscopy, diagnostic, with or without synovial biopsy
29861	Hip Arthroscopy, removal of loose body or foreign body
29862	Hip Arthroscopy, chondroplasty, abrasion arthroplasty, and/or resection of labrum
29863	Hip Arthroscopy, synovectomy
29914	Hip Arthroscopy, with femoroplasty
29915	Hip Arthroscopy, with acetabuloplasty
29916	Hip Arthroscopy, with labral repair

Methods

- Case Identification

- Demographic data (age, sex, race, insurance status) and limited diagnostic information (ICD-9 codes) was collected
- Unique patient identifiers used to track patients longitudinally to identify cases of revision hip arthroscopy (same CPT codes) or conversion to hip resurfacing/THA, and to identify complications requiring re-admission

ICD9 Code	Description
81.51	Total hip replacement
0.85	Resurfacing hip, total, acetabulum and femoral head
0.86	Resurfacing hip, partial, femoral head
0.87	Resurfacing hip, partial, acetabulum

- Kaplan-Meier survival analysis was performed and revision hazards measured at 2, 5 and 10 years following the index hip arthroscopy procedure

Methods

- Volume analysis

- Surgeon license numbers were then utilized to track individual surgeon volume
- Volume was analyzed by looking at different volume strata, determined by creating a stratum-specific likelihood ratio (SSLR) threshold analysis model
 - Utilizing endpoint of revision hip arthroscopy, hip resurfacing or THA within 5 years of the index procedure

- Cox Regression Analysis

- Performed to determine the effect of age, sex, race, insurance status and surgeon annual volume as risk factors for revision surgery

Results

- 8267 hip arthroscopy cases were performed from 1998-2012

- There was a 750% increase in from 2002-2012

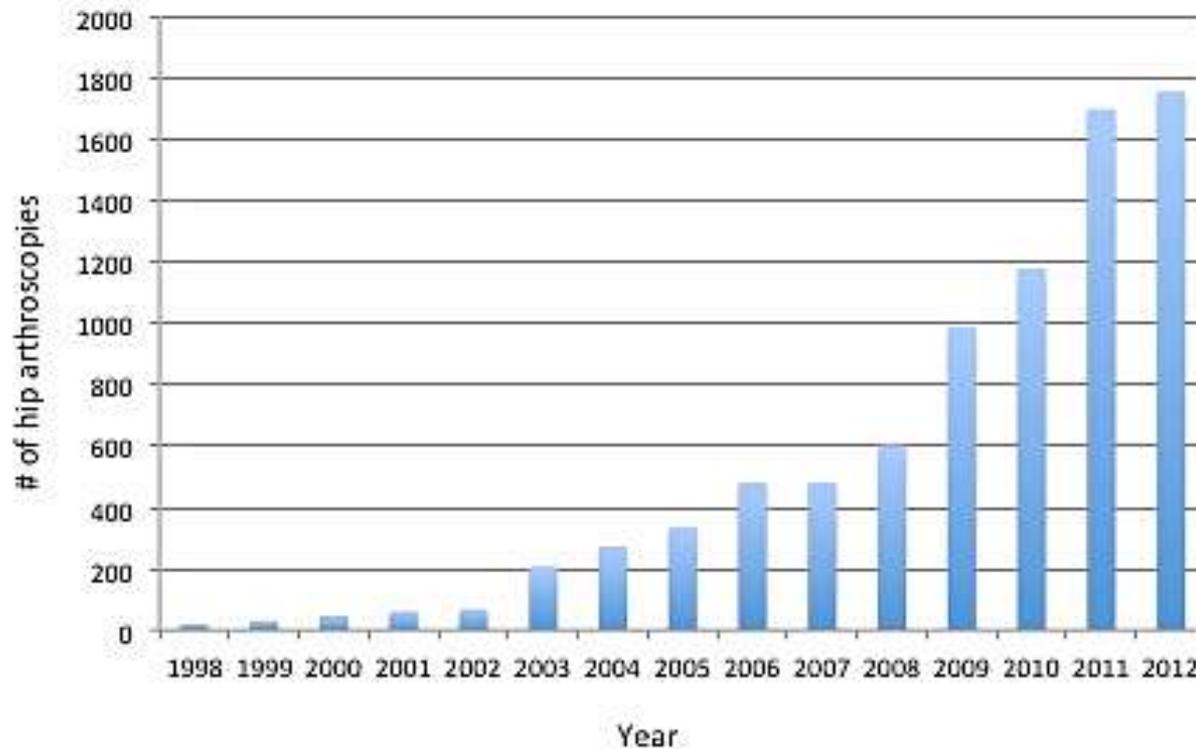


Figure 1. Annual Hip Arthroscopy Volume

Results

- Revision Surgery

- Repeat surgery was required in 1087 cases (13.2%) at a mean of 1.7 ± 1.6 years
 - 311 (3.8%) revision hip arthroscopy cases
 - 796 (9.6%) hip resurfacing or total hip arthroplasty cases
- Twenty patients (0.2%) had both a revision hip scope and eventual conversion to hip arthroplasty within 5 years

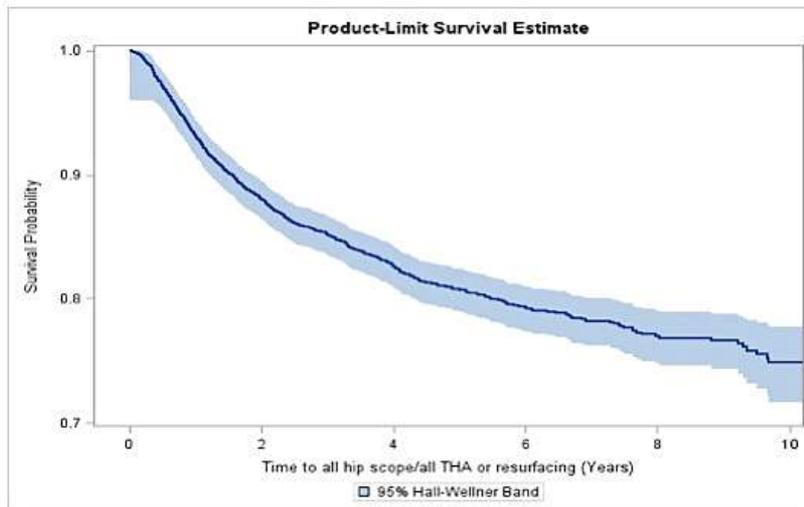


Figure 2. Kaplan Meier survival analysis identified a survival rate of 88.1% at 2-years, 80.7% at 5-years, and 74.9% at 10-years

Results

- Cox Proportional Hazard Analysis

	Hazard ratio	95% HR Confidence Limits		P-value
Age ≥ 50 (Ref: < 50)	2.09	1.82	2.39	<.01
Female (Ref: Male)	0.89	0.79	1.01	0.08
Race (Ref: White)				
Non-white	0.74	0.64	0.86	<.01
Payer status (Ref: Private)				
Medicare	1.22	0.94	1.59	0.13
Medicaid	1.33	0.94	1.89	0.11
Worker's Compensation	0.95	0.76	1.18	0.63
Other	0.72	0.50	1.03	0.07
Hip Osteoarthritis (Ref: No OA)	2.72	2.21	3.34	<.01
CPT Code*				
Diagnostic	0.42	0.23	0.79	0.01
Removal of Loose Body	1.61	1.25	2.06	<.01
Labral Repair	0.71	0.54	0.93	0.01
Hip Scope Annual Volume (Ref: < 102)				
102 ≤ Volume < 164	0.90	0.74	1.10	0.30
164 ≤ Volume < 340	0.42	0.32	0.54	<.01
≥ 340	0.17	0.07	0.38	<.01

- Age>50 and a diagnosis of Hip OA were associated with increased revision rates

- Surgeon volume <102 cases/year was associated with a higher revision rate compared with >164 cases/year

Results

- Revised KM Survival Analysis

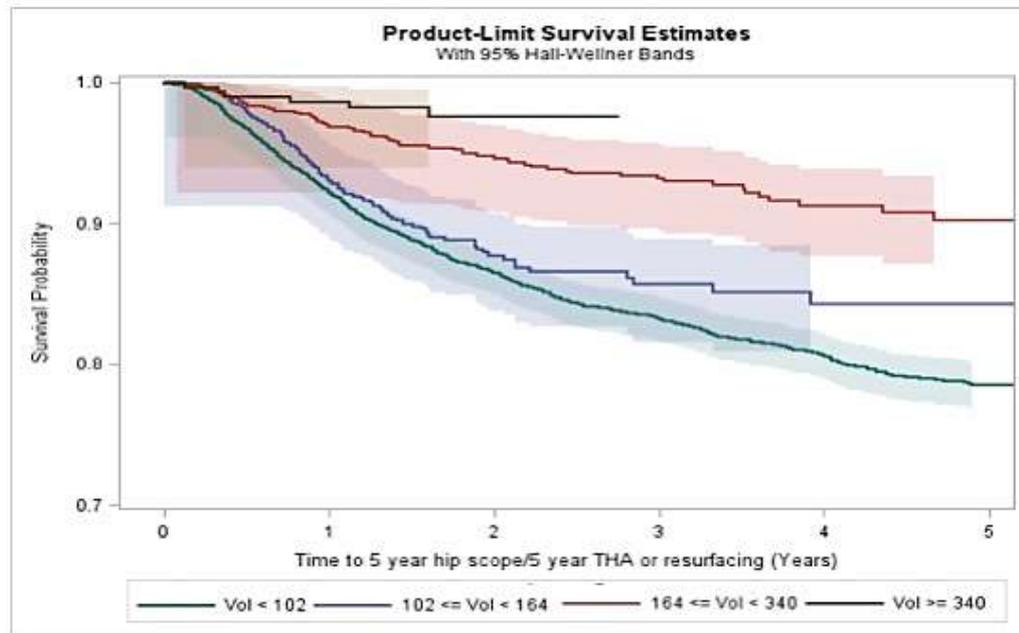


Figure 3. Kaplan Meier survival curve for primary hip arthroscopy over a 5 year time period for the different volume-strata identified with SSLR threshold-analysis model. Lower survival rates were identified for lower volume surgeons (<102 cases/yr vs >164 case year).

Discussion

- Conclusion

- Hip arthroscopy rates continue to rise, with corresponding increases in rates of revision surgery
- Kaplan Meier survival analysis showed a 2-year survival rate of 88.1%, 5-year of 80.7% and 10-year of 74.9%
- Age greater than 50, and a diagnosis of OA increased risk of re-operation, while performing a labral repair and having the procedure performed by a higher volume surgeon (>160 cases/yr) was associated with a lower risk of re-operation

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