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Revision Hip Arthroscopy Patients Experience Worse Outcomes at Mid-Term follow-up of 5-Years

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Disclosures



- Thomas W. Fenn, BS: Nothing to Disclose
 - Reagan Chapman, BS: Nothing to Disclose
 - Mario Hevesi, MD, PhD: Moximed, LLC, Journal of Cartilage and Joint Preservation
 - Nolan Horner, MD: Nothing to Disclose
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Background:



- Femoroacetabular impingement syndrome (FAIS) clinical diagnosis of abnormal bony morphology of the hip causing damage to surrounding soft tissue structures (labrum and acetabular cartilage)
- Hip arthroscopy has become the mainstay of treatment with favorable postoperative outcomes

Clinical outcomes after revision hip arthroscopy in patients with femoroacetabular impingement syndrome (FAIS) are inferior compared to primary procedures. Results from the Danish Hip Arthroscopy Registry (DHAR)

B. Mygine-Klavsen, T.G. Nielsen, B. Lund, M. Lind
Knee Surgery, sports Traumatology, Arthroscopy.
2021, Volume 29, Issue 12:2985-2992.

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- Subsequent revision rates up to **2.5% - 10%**
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Background: Reasons for Revisions



Clinical outcomes after revision hip arthroscopy in patients with femoroacetabular impingement syndrome (FAIS) are inferior compared to primary procedures. Results from the Danish Hip Arthroscopy Registry (DHAR)

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2021, Volume 29, Issue 12:2985-2992.

- Scar tissue
- Residual osseous impingement
- Insufficient healing of the labral repair

Revision Hip Arthroscopy in the Native Hip: A review of Contemporary Evaluation and Treatment Options

K. Kunze, RJ Olsen, SW Sullivan, BU Nwachukwu *Frontiers in Surgery.* 2021, July.

- Residual cam morphology from inadequate femoral osteochondroplasty
- Progressive chondral and labral pathologies

Background: Patient Predictors of Revision

Causes and Risk Factors for Revision Hip Preservation Surgery

BF. Ricciardi, K. Fields, BT. Kelly, AS. Ranawat, SH. Coleman, EL. Sink.

American Journal of Sports Medicine.
2014 Volume 42, Issue 11, 2627-2633

Revision Hip Preservation Surgery With Hip Arthroscopy: Clinical Outcomes

BG. Domb, CE. Stake, D. Lindner, Y. El-Bitar, TJ. Jackson.

Arthroscopy: Journal Arthroscopy Related Surgery.
2014, Volume 30, Issue 5, 581-587

Arthroscopic Hip Revision Surgery for Residual Femoroacetabular Impingement (FAI): Surgical Outcomes Compared With a Matched Cohort After Primary Arthroscopic FAI Correction

CM. Larson, MR. Giveans, KM. Samuelson, RM. Stone, A. Bedi.

American Journal of Sports Medicine.
2014, Volume 42, Issue 8, 1785-1790

• **Negative Predictors:**

- Female
- Younger age
- Worse preoperative PRO scores

• **Positive Predictors:**

- Previous open surgery
- Pincer/Cam impingement
- Symptomatic heterotopic ossification
- Segmental labral defects

- Improved femoral head-neck offset
- Treatment of subspine or AIIS impingement
- Labral reconstruction
- Capsular preservation/Plication

Background: Primary vs. Revision



Outcomes of Revision Hip Arthroscopic Surgery:

A Systematic Review and Meta-analysis

M. O'Connor, GK. Steinl, AS. Padaki, KR. Duchman, RW.

Westermann, TS. Lynch

American Journal of Sports Medicine.

2020, Volume 48, Issue 5, 1254-1262

	<u>Primary</u> (# of studies)	<u>Revision</u> (# of studies)
mHHS	82.77 (3)	74.61 (10)
HOS-ADL	85.15 (3)	76.34 (7)
HOS-SS	73.36 (3)	58.97 (7)
SF-12	71.52 (3)	50.58 (3)

- Inadequate bony resection most common reason for revision HA
- Significant improvement preoperative baseline to final follow-up in both primary and revision HA
- After revision:
 - Total hip arthroplasty (THA) conversion: 0% – 14%
 - Further arthroscopic procedure: 2% - 14%

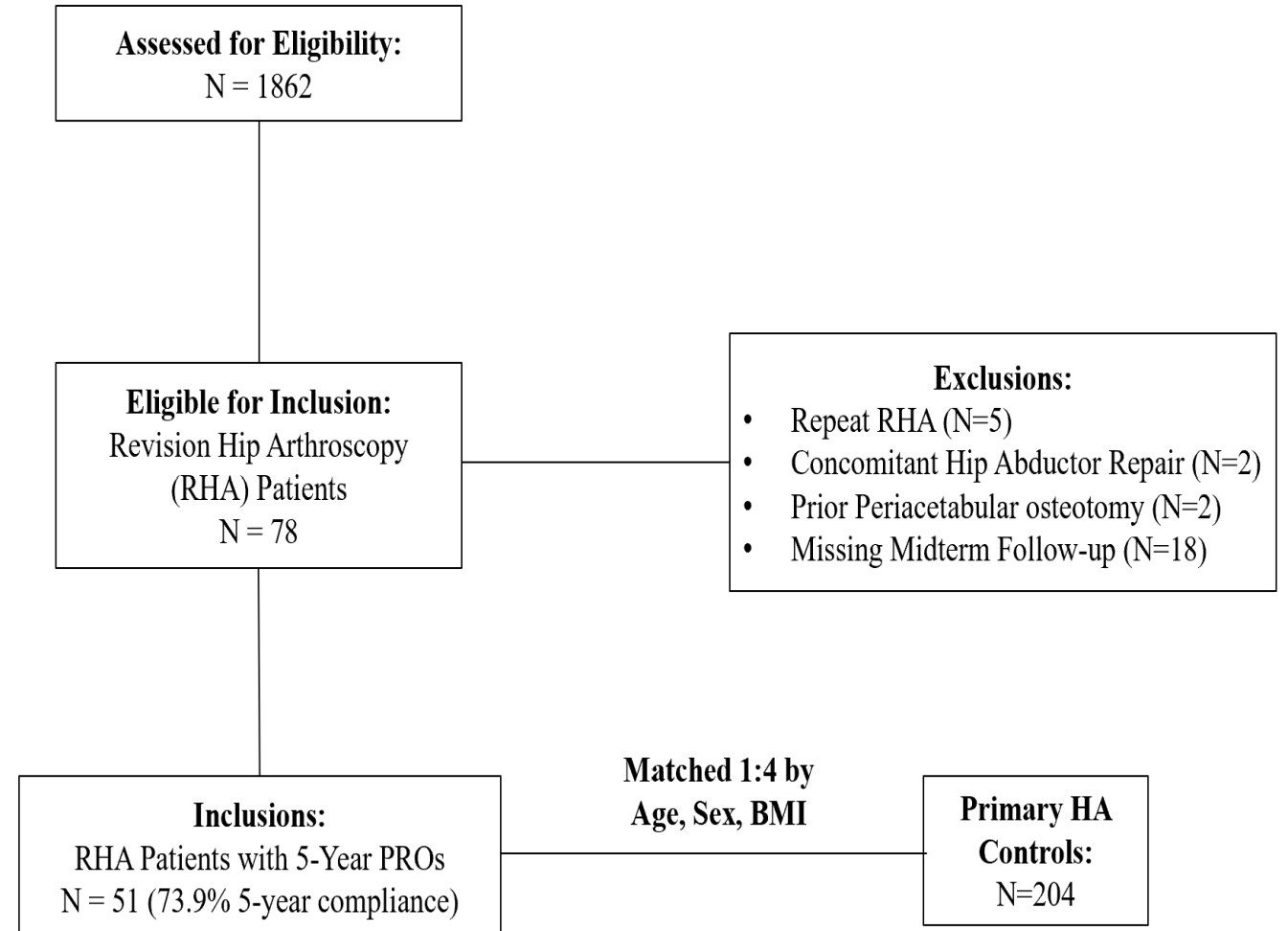
Purpose/Hypothesis



- **To compare mid-term clinical outcomes between patients undergoing primary hip arthroscopy (HA) vs revision hip arthroscopy (RHA) for femoroacetabular impingement syndrome (FAIS)**
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Methods

- Retrospective review of patients with FAIS who underwent either primary or revision HA from 2012 – 2017
- Inclusion criteria
 - Clinical and radiographic evidence of FAIS
 - Failed preoperative conservative treatment (physical therapy, oral NSAIDs, intra-articular injection)
 - Completion of at least one PRO at minimum 5-year follow-up
- Exclusion criteria
 - Age < 18 years
 - Concomitant hip procedures (ie., gluteus medius/minimus repair)
 - History of developmental disorders (dysplasia, SCFE, Legg-Calve-Perthes)



- Revision patients matched to primary HA patients by age, sex, and BMI in a 1:4 case-control ratio

Methods



- Patient Reported Outcomes (PROs) collected preoperatively and at minimum 5-years postoperatively:
 - Hip Outcome Score Activities of Daily Living (**HOS-ADL**) and Sports (**HOS-SS**) subscales
 - Modified Harris Hip Score (**mHHS**)
 - 12-item International Hip Outcome Tool (**iHOT-12**)
 - Visual analog scales (**VAS**) for **Pain** and **Satisfaction**
- Rates of **Minimally Clinically Important Difference (MCID)** and **Patient Acceptable Symptomatic State (PASS)** achievement calculated

	MCID	PASS
HOS-ADL	10.2	92.2
HOS-SS	15.2	80.9
mHHS	11.4	83.6
iHOT-12	15.1	74.3

Results



Table 1. Patient Demographics and preoperative characteristics

	Revision	Primary	P-Value
N	51	204	
Age	32.6 ± 10.2	33.3 ± 11	0.714
Gender			0.99
Male	16	64	
Female	35	140	
BMI	26.5 ± 5.9	25.1 ± 4.8	0.069
Smoking	5.9%	10.8%	0.288
Physically Active	56.9%	72.5%	0.030*
Back Pain	11.8%	15.2%	0.534
Psychiatric History	9.8%	14.7%	0.363

Abbreviations: BMI, body mass index. '*' indicates statistical significance at an alpha level of <0.05.

Results



No significant difference between RHA and primary HA in preoperative or postoperative radiographic measures

Table 2. Preoperative and Postoperative Radiographic Measurements

	Preoperative Radiographs		
	Revision	Primary	P-Value
N	51	204	
LCEA	29.6 ± 6.3	31.3 ± 5.8	0.087
Tonnis	8.6 ± 4.3	7.4 ± 3.9	0.083
Alpha Angle	56.2 ± 15.6	59.5 ± 12.6	0.230
Tonnis Grade =1	9.5%	6.3%	0.503
	Postoperative Radiographs		
	Revision	Primary	P-Value
N	51	204	
LCEA	28.9 ± 5.6	30.0 ± 5.8	0.093
Tonnis	8.4 ± 4.9	7.5 ± 4.2	0.257
Alpha Angle	36.9 ± 4.2	39.1 ± 5.9	0.125

Abbreviations: LCEA, Lateral center edge angle. ‘*’ indicates statistical significance at an alpha level of <0.05

Results: Intraoperative Findings



Table 2. Intraoperative findings and procedures

	<u>Revision</u>	<u>Primary</u>	<u>P-Value</u>
N	51	204	
Labral Treatment			
Debridement	96.1%	99.0%	0.175
Repair	82.4%	97.5%	<0.001*
Reconstruction	5.9%	0.0%	<0.001*
Capsular Treatment			
Plication	92.2%	97.1%	0.117
Reconstruction	23.5%	0.0%	<0.001*
Number of Anchors	2.7 ± 1.1	2.4 ± 0.7	0.099
Acetabuloplasty	72.9%	93.6%	<0.001*
Femoral Osteochondroplasty	95.8%	98.5%	0.242
Heterotrophic Ossification	4.7%	1.6%	0.235

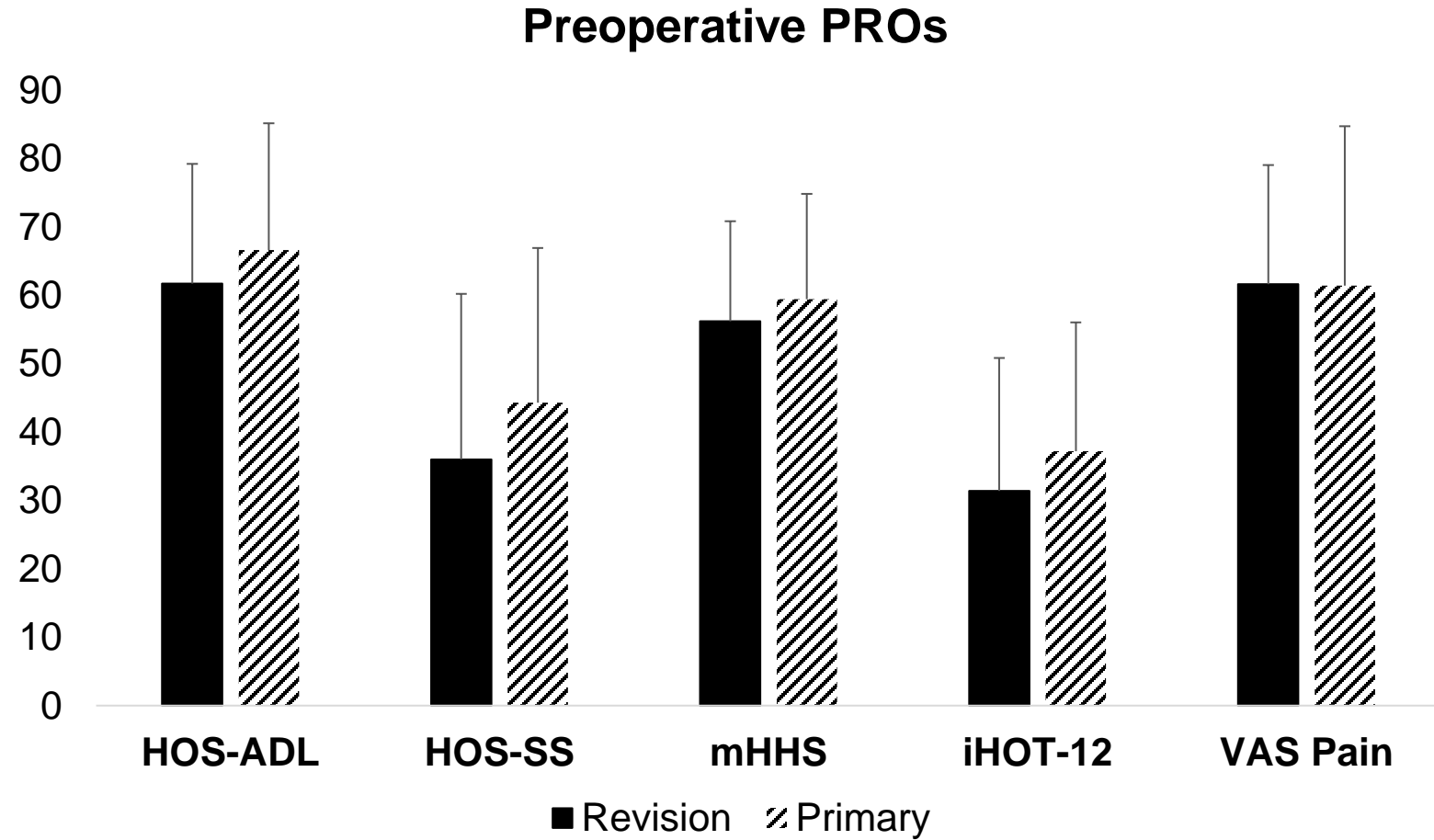
‘*’ indicates statistical significance at an alpha level of <0.05

Significantly lower labral repair/acetabuloplasty and **significantly higher** labral/capsular reconstruction in revision group

Results: Preoperative PROs



No significant difference
between RHA and
primary HA in
preoperative PROs

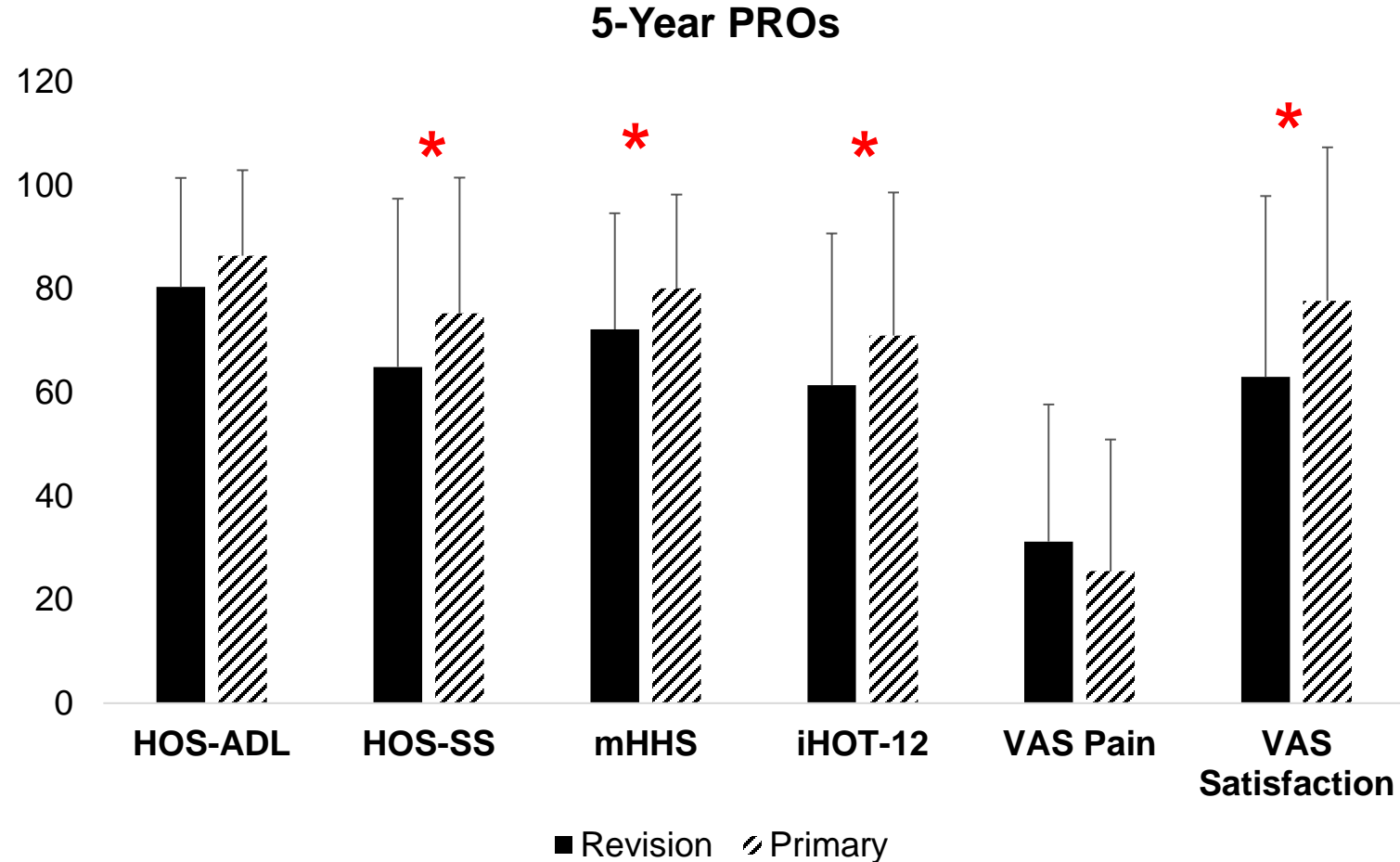


Results: 5-Year PROs



Both groups significantly improved postoperatively

Revision HA patients demonstrated lower HOS-SS, mHHS, iHOT-12, & VAS Satisfaction at 5-Years

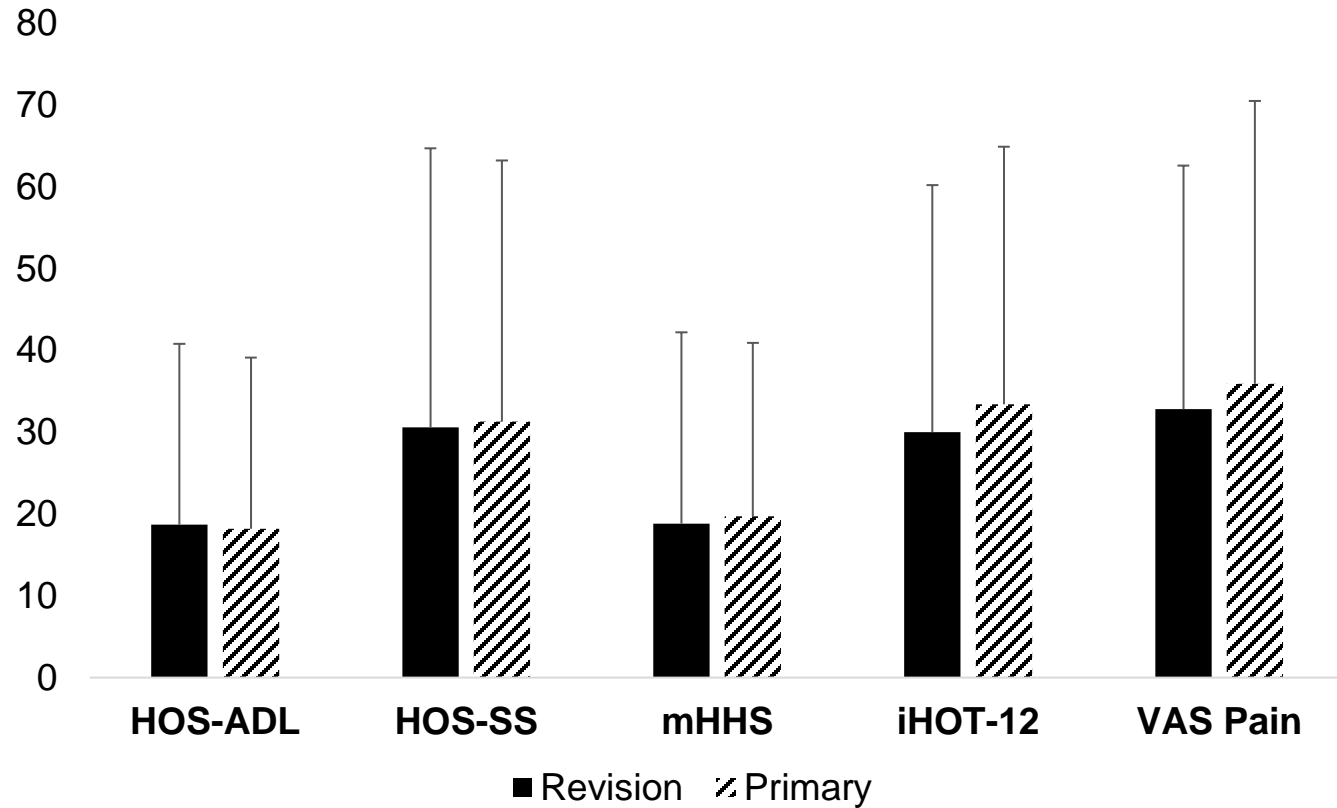


Results: Magnitude of Change



No significant difference in magnitude of change (delta) between cohorts

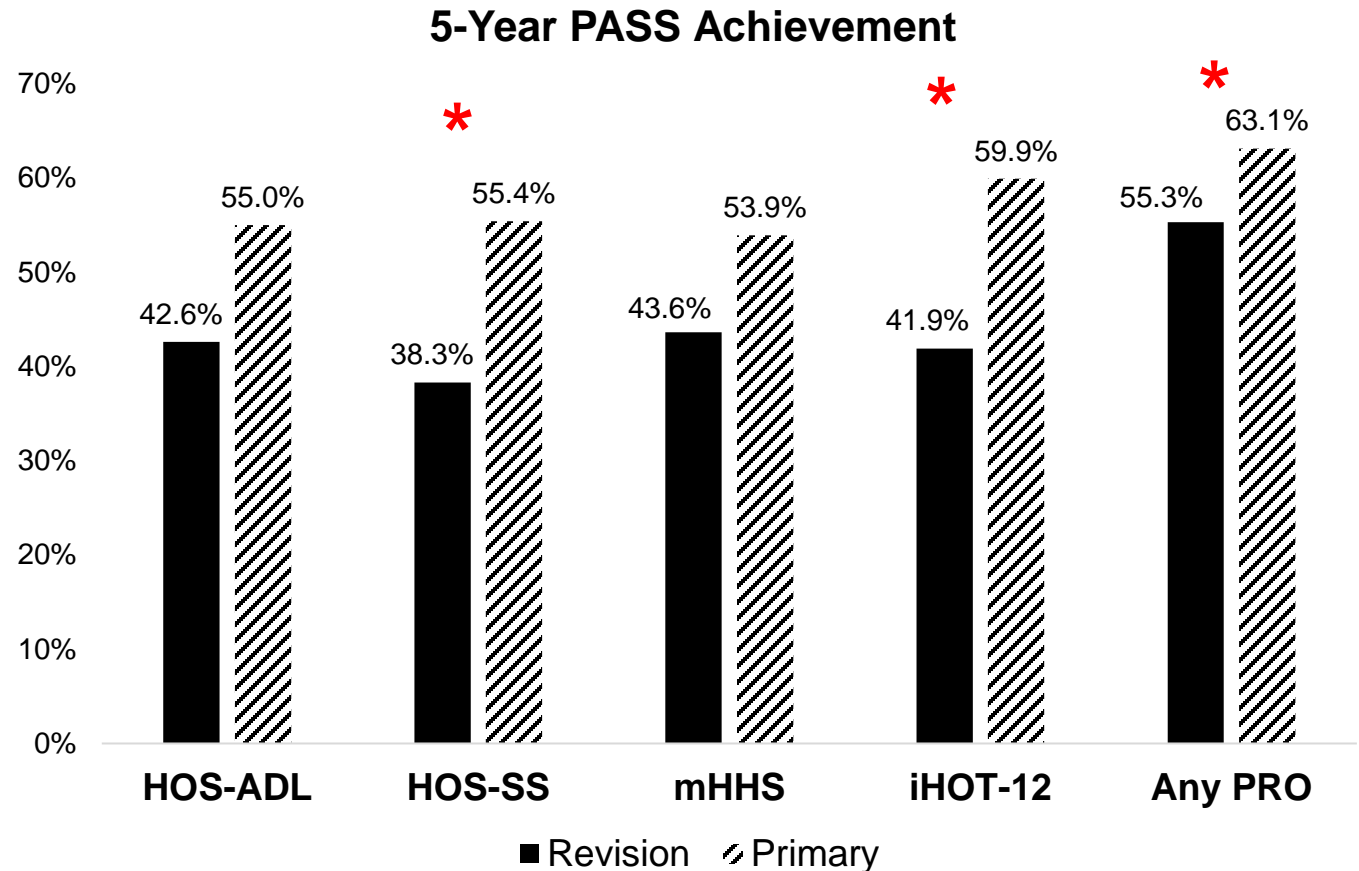
Preoperative to 5-Year Magnitude of Change



Results: Clinically Significant Outcomes



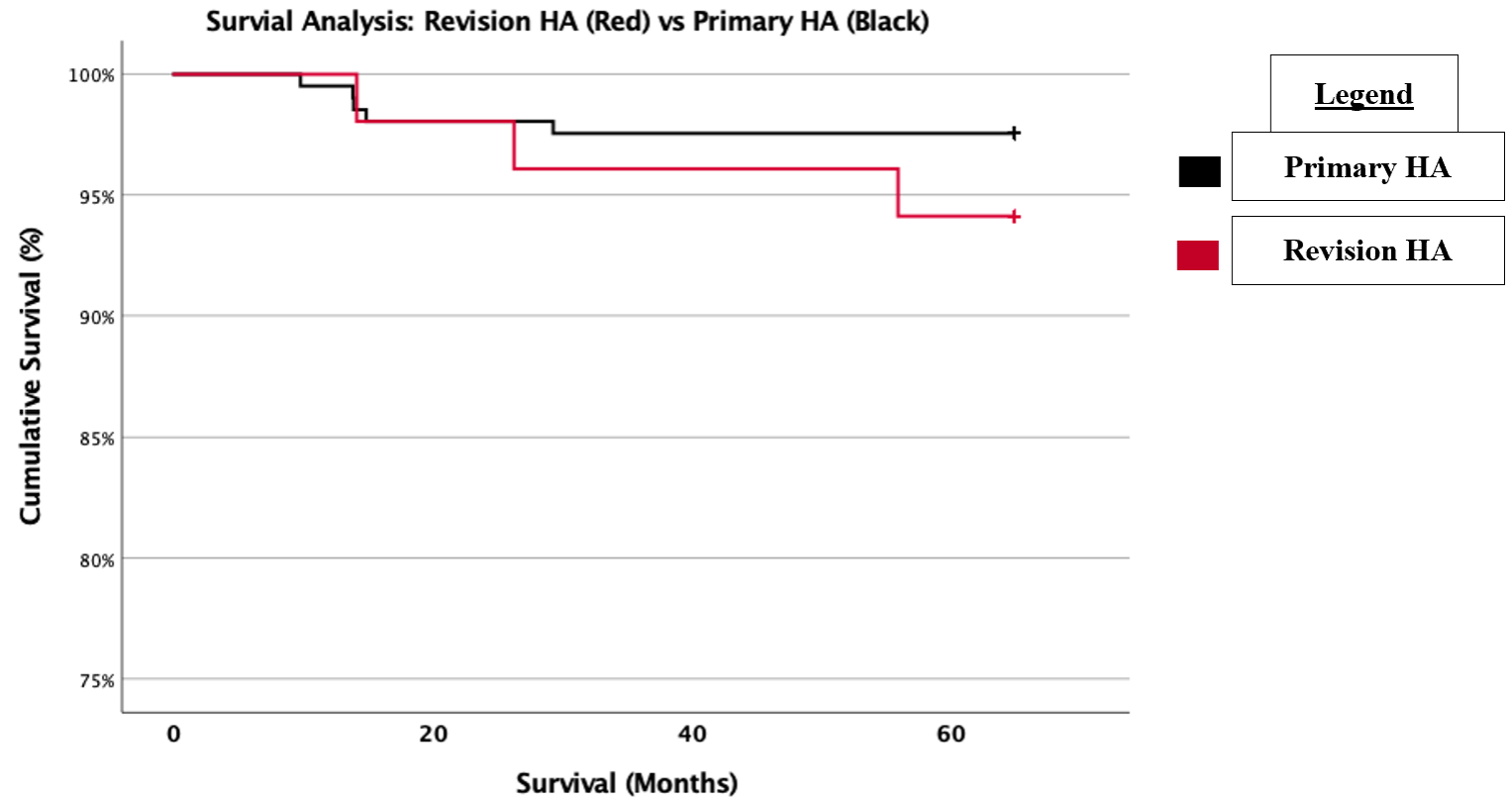
- **No significant differences** in rates of **MCID** achievement
- RHA patients demonstrated **lower HOS-SS & iHOT-12 PASS** achievement



Results: Survivorship



- No significant differences in rates of post-operative complication (RHA: 2 patients with neuropathy vs. HA: 1 patient with neuropathy, $p=0.102$)
- No significant differences in conversion to THA (RHA:3.9% vs HA:1.0%, $p=0.180$)
- No significant differences in subsequent revision hip arthroscopy (RHA:3.9% vs HA: 2.0%, $p=0.345$)
- No significant difference in gross survivorship (RHA:92.2% vs HA:97.1%) ($p=0.254$)



Conclusion/Main Findings



- **Both groups demonstrate significant improvement postoperatively**; Patients undergoing **revision hip arthroscopy** may experience **significantly worse overall outcomes at mid-term follow-up** compared to primary HA patients, however, the **magnitude of improvement was similar** between groups
 - **Revision hip arthroscopy patients** experience **lower rates of PASS achievement** but **similar rates of MCID achievement** compared to primary HA
 - Both revision and primary hip arthroscopy patients demonstrated **strong survivorship and similar rates of subsequent revision and/or conversion to total hip arthroplasty** between the two groups
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