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Restoration of Hip Kinematics One Year after Hip Arthroscopy for Femoroacetabular Impingement Syndrome

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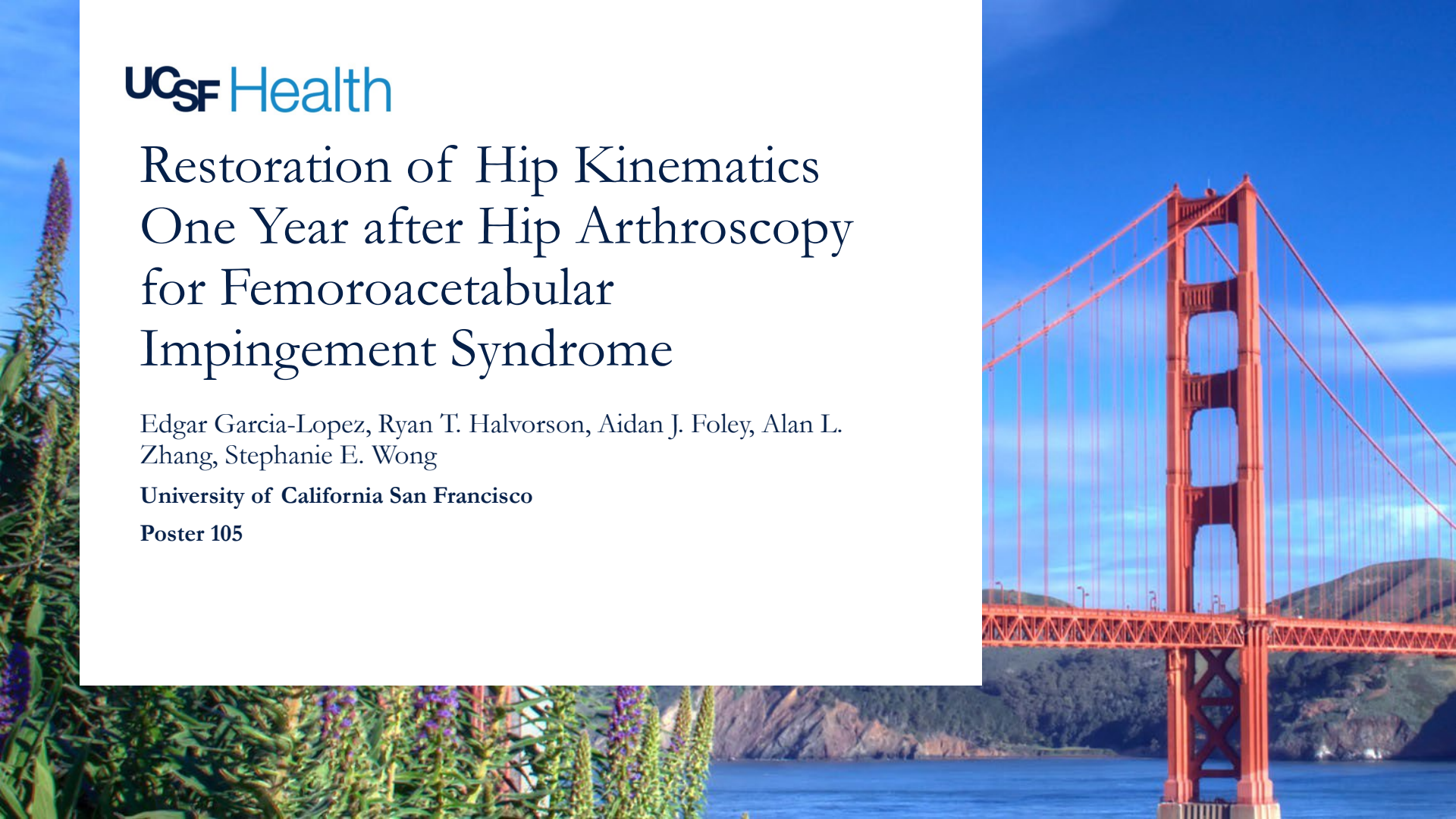
Poster 105



Disclosure

The authors do not have any disclosures pertaining to this study.

Introduction

This study aimed to assess the impact of hip arthroscopy on biomechanical function in patients with femoroacetabular impingement syndrome (FAIS) during gait, stair ascent and descent.

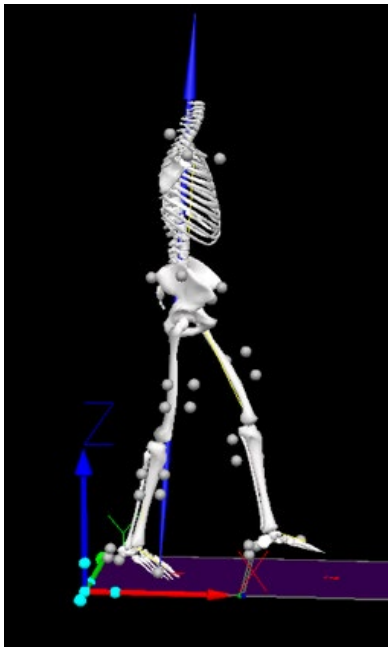
We hypothesized that symptomatic FAIS hips would exhibit decreased motion preoperatively compared to contralateral hips, but that these differences would be corrected postoperatively

Methods

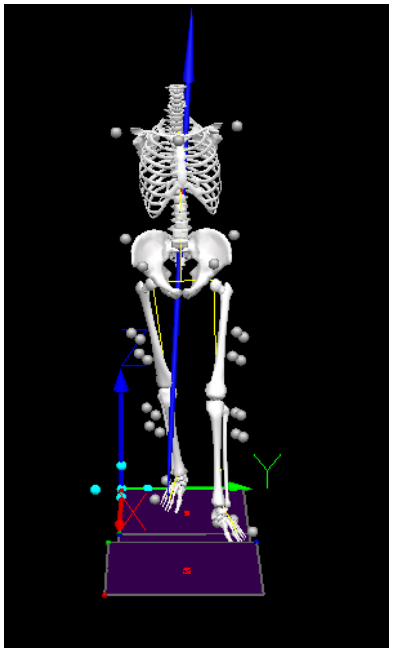
Sample	n=10 (60% female) Age: 32.1 ± 5.3	*Functional Tests*	Normal Gait Stair Climb Stair Descent
3-dimensional motion tracking	10-camera motion analysis (240 Hz)	*Ground reaction forces*	Force plates
Joint kinematics	Peak and valley angles for ankle, knee, and hip were calculated in sagittal, coronal and transverse planes using *Visual3D* ®	*Statistical Analysis*	Paired t-tests comparing affected and unaffected limbs

Gait 3D Motion Analysis

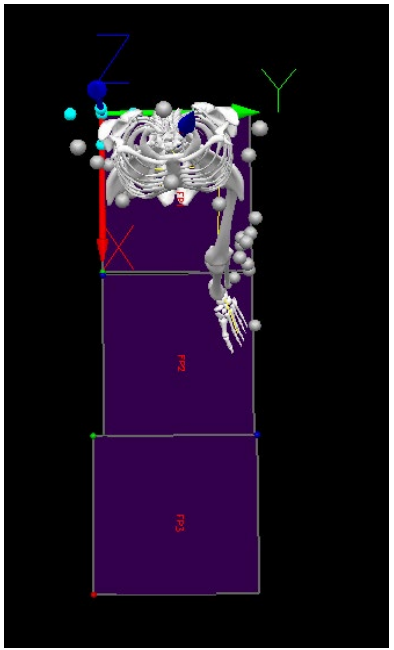
Coronal



Sagittal



Axial



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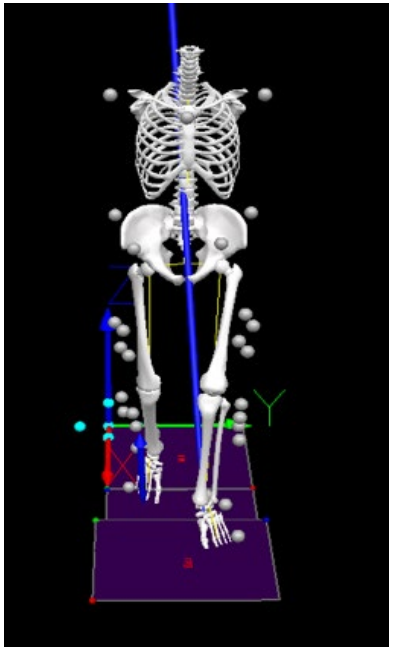
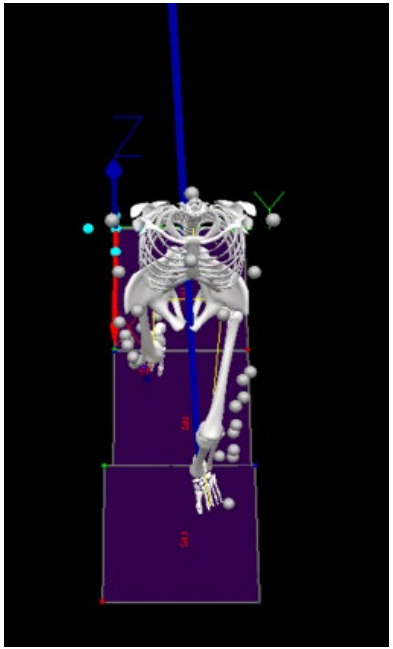
Stair Ascent 3D Motion Analysis

Coronal

Sagittal



Axial



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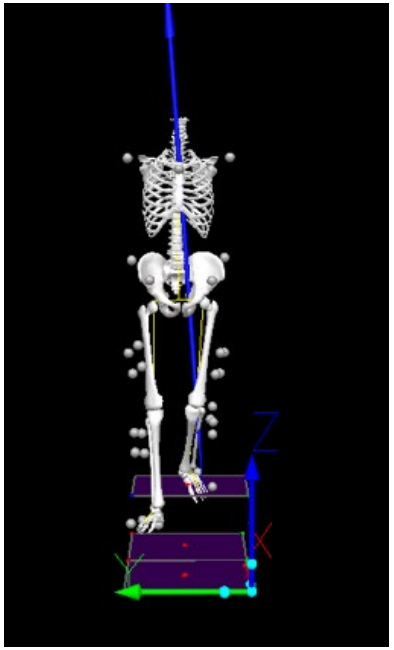
Stair Descent 3D Motion Analysis

Coronal

Sagittal



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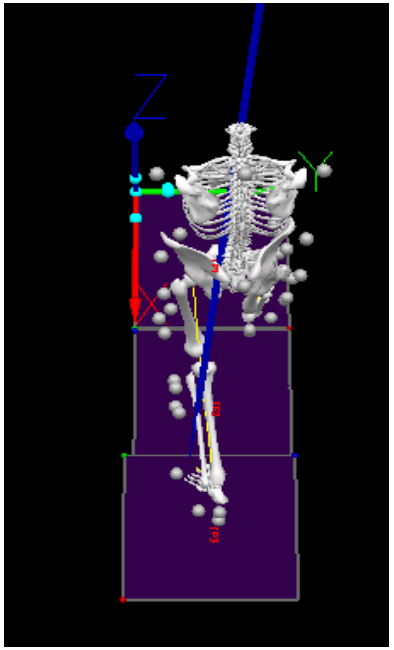

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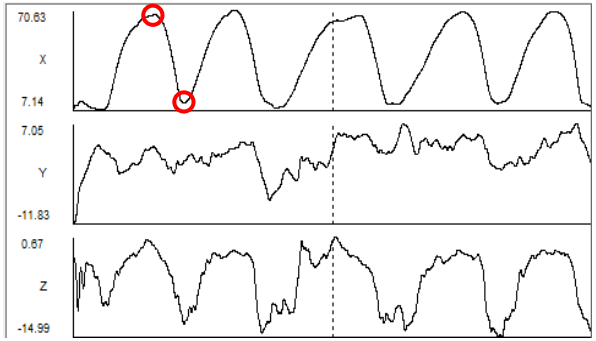
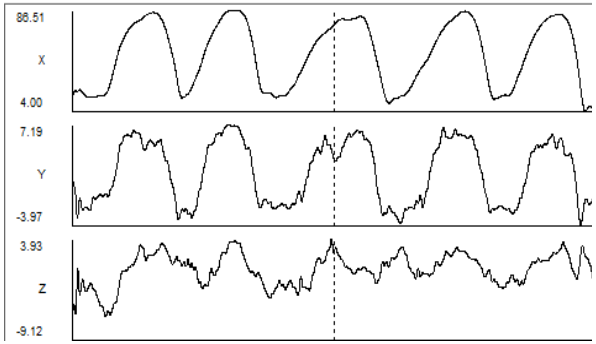
Joint Kinematics Data – Peak and Valley

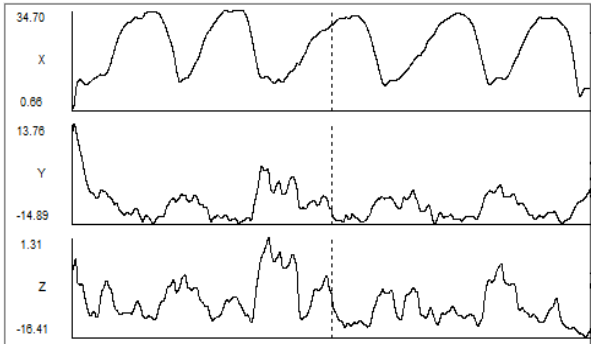
Hip



Knee



Ankle



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Results - HOOS Scores

Preoperative and 1-Year Postoperative HOOS Scores by Subscore

		Pre-op Mean (SD)	1-year post-op Mean (SD)	p-value
HOOS				
	Symptoms	56.1 (11.5)	76.1 (10.3)	<0.001
	Pain	56.4 (15.1)	83.3 (9.2)	0.003
	ADL	58.5 (17.3)	87.7 (10.7)	<0.001
	Sport/Recreation	34.7 (13.9)	80.6 (12.1)	<0.001
	QoL	22.9 (10.3)	64.6 (11.7)	<0.001

Results - Gait Kinematics

Surgical and non-surgical side pre-operatively and 1 year post op

		Pre-operative			1-year Post-operative		
		Control Side Mean (SD)	Operative Side Mean (SD)	p-value	Control Side Mean (SD)	Operative Side Mean (SD)	p-value
Hip							
	Flexion	21.4 (8.4)	17.8 (10.3)	**<0.001**	22.3 (9.3)	25.8 (5.5)	**<0.001**
	Extension	-16.1 (8.2)	-15.9 (9.4)	0.7	-14.1 (7.8)	-15.1 (6.8)	0.2
	Adduction	7.5 (1.7)	7.2 (2.6)	0.3	6.2 (2.6)	6.2 (2.4)	0.9
	Abduction	-2.7 (4.0)	-1.5 (1.8)	**0.003**	-2.4 (2.9)	-3.9 (2.8)	**<0.001**
	IR	3.9 (5.8)	5.7 (6.1)	0.09	5.4 (5.8)	4.0 (5.8)	0.04
	ER	-7.7 (5.2)	-5.5 (5.8)	**0.01**	-6.7 (5.3)	-8.6 (4.3)	**0.01**
Knee							
	Flexion	42.9 (8.3)	40.5 (9.1)	**0.03**	40.9 (12.8)	41.8 (9.5)	0.5
	Extension	-0.7 (3.6)	-1.9 (5.8)	**0.001**	-1.4 (5.0)	0.65 (4.0)	**<0.001**
Ankle							
	Flexion	14.0 (4.3)	13.2 (4.0)	**0.03**	14.2 (2.8)	13.8 (3.9)	0.2
	Extension	-12.5 (5.2)	-11.8 (5.8)	0.8	-11.7 (5.1)	-12.1 (5.0)	0.5

Results - Stair Climb Kinematics

Surgical and non-surgical side pre-operatively and 1 year post op

		Pre-operative			1-year Post-operative		
		Control Side Mean (SD)	Operative Side Mean (SD)	p-value	Control Side Mean (SD)	Operative Side Mean (SD)	p-value
Hip							
	Flexion	45.6 (8.9)	39.7 (13.3)	**>0.001**	37.1 (16.4)	43.7 (10.2)	**0.002**
	Extension	1.7 (7.9)	-0.70 (9.4)	**0.02**	-2.4 (7.6)	0.21 (9.5)	**0.03**
	Adduction	5.6 (3.2)	5.7 (3.9)	0.9	4.2 (2.5)	5.04 (1.9)	**0.01**
	Abduction	-3.8 (2.1)	-3.0 (2.9)	0.05	-3.3 (2.1)	-5.8 (1.82)	**<0.001**
	IR	1.7 (3.3)	4.4 (5.6)	**<0.001**	4.87 (5.5)	3.7 (5.1)	0.06
	ER	-8.7 (2.6)	-6.3 (5.3)	**0.002**	-6.22 (5.3)	-8.2 (4.3)	**0.008**
Knee							
	Flexion	46.2 (8.9)	39.1 (14.4)	**<0.001**	43.3 (9.02)	43.6 (8.9)	0.8
	Extension	8.4 (6.7)	3.7 (5.9)	**<0.001**	4.96 (5.4)	6.1 (6.5)	0.2
Ankle							
	Flexion	10.8 (5.7)	8.8 (4.9)	**0.002**	9.8 (3.6)	9.1 (4.52)	0.21
	Extension	-14.0 (7.2)	-13.1 (6.0)	0.22	-12.7 (6.0)	-13.0 (5.8)	0.7

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Results - Stair Descent Kinematics

Surgical and non-surgical side pre-operatively and 1 year post op

		Pre-operative			1-year Post-operative		
		Control Side	Operative Side	p-value	Control Side	Operative Side	p-value
		Mean (SD)	Mean (SD)		Mean (SD)	Mean (SD)	
Hip							
	Flexion	11.5 (10.6)	11.5 (7.7)	0.69	12.9 (8.7)	14.5 (6.7)	0.14
	Extension	-8.1 (12.3)	-8.3 (12.5)	**0.01**	-10.6 (11.0)	-11.9 (10.4)	0.14
	Adduction	4.0 (3.2)	4.5 (2.7)	0.55	4.3 (2.2)	3.0 (1.8)	**<0.001**
	Abduction	-3.5 (3.1)	-2.8 (2.6)	0.15	-2.8 (2.1)	-5.42 (1.8)	**<0.001**
	IR	-0.1 (2.8)	1.6 (6.7)	0.91	1.6 (5.5)	-0.8 (5.1)	**0.001**
	ER	-7.2 (4.9)	-6.1 (6.1)	0.95	-7.96 (5.7)	-10.8 (3.5)	**<0.001**
Knee							
	Flexion	48.6 (19.3)	49.7 (20.4)	0.46	47.7 (18.1)	53.5 (10.7)	**0.003**
	Extension	8.6(6.6)	9.4 (6.1)	0.77	5.3 (12.4)	12.5 (8.5)	**<0.001**
Ankle							
	Flexion	27.8 (8.6)	30.0 (5.3)	**0.02**	26.7 (2.8)	29.6 (8.5)	**0.03**
	Extension	-19.4 (5.6)	-18.7 (5.3)	0.76	-16.0 (6.0)	-13.8 (6.1)	**0.02**

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Discussion

- Hip arthroscopy for FAIS restores hip flexion, abduction, and external rotation during dynamic tasks such as gait and stair ascent.
- Tasks requiring less hip flexion, like stair descent, were not affected.
- Significant improvements in PROMs were observed, however these, did not correlate with joint kinematics.

Thank You!