

# Hip Arthroscopy in Patients with Mild to Moderate Dysplasia: When do they Fail?

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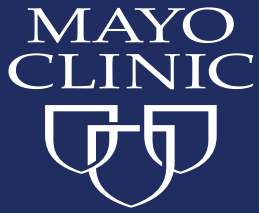
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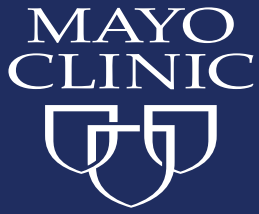
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# Conflict of Interest Disclosures

Author Name	Disclosures
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Rafael J Sierra	American Association of Hip and Knee Surgeons: Board or committee member Biomet: IP royalties; Paid consultant; Paid presenter or speaker DePuy, A Johnson & Johnson Company: Research support Journal of Arthroplasty: Editorial or governing board Link Orthopaedics: Paid consultant Stryker, Biomet: Research support Zimmer: Research support



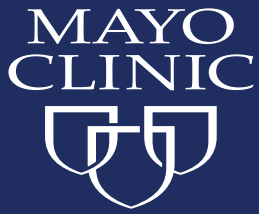
# Purpose

Compare a group of dysplastic hips treated successfully with hip arthroscopy to a failed group to determine

- 1) pre-operative patient characteristics and radiographic parameters and
- 2) intra-operative findings and treatment associated with outcome.

## Methods

- Retrospectively reviewed a prospective database of 20 adult patients with hip dysplasia who underwent primary hip arthroscopy between January 2009 and February 2013.
- Compared modified Beck scores and preoperative and postoperative radiographic measurements between patients who failed hip arthroscopy (11 patients) and those who did not (9 patients).
- Failure after hip arthroscopy was defined as a modified Harris Hip Score (mHHS)  $<80$  or need for subsequent hip arthroscopy, arthroplasty or periacetabular osteotomy (PAO).



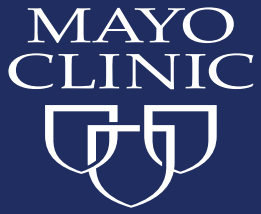
# Results:

## Table 1 Demographics

	<b>Failure (N=11)</b>	<b>Success (N=9)</b>	<b>p value</b>
Gender			>0.999 <sup>1</sup>
Female	9 (52.94%)	8 (47.06%)	
Male	2 (66.67%)	1 (33.33%)	
Age at Surgery			0.4255 <sup>2</sup>
N	11	9	
Mean (SD)	30.4 (15.2)	36.3 (17.0)	
Range	(16.0-52.0)	(16.0-69.0)	

# Results

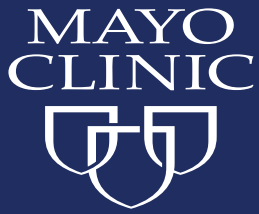
- The mean followup for the successful patients was 58 months (37-82 months) with average modified Harris Hip Score (mHHS) of 93.
- In the failure group, average time to failure occurred at 23 months, with 7 PAOs, 2 THAs, 1 revision hip arthroscopy, and 1 hip with a low mHHS that had not undergone further surgery.
- There was no difference in cartilage damage (Beck score) between the success and failure group (1.7 versus 2.0;  $p=0.3$ ).
- Preoperative radiographs demonstrated a lower LCEA (18 versus 21;  $p=0.02$ ) in the failure group and the LCEA was predictive of success, with all successes occurring with a LCEA of 17 or greater.
- Labral repair was performed in 10 cases and was successful in 8 patients (89%).
- The failure group was more likely to have rim resection  $>3$  mm performed (HR 3.53;  $p=0.04$ ).



# Results:

## Table 2 Pre-operative Radiographic Findings

	<b>Failure</b> <b>(N=11)</b>	<b>Success</b> <b>(N=9)</b>	<b>p value</b>
<b>Alpha Angle</b>			
N	11	9	0.4496 <sup>2</sup>
Mean (SD)	58.4 (15.9)	53.9 (9.4)	
Range	(33.0-77.9)	(45.0-67.9)	
<b>Center Edge Angle</b>			
N	11	9	0.0171 <sup>2</sup>
Mean (SD)	18.0 (3.3)	21.3 (2.2)	
Range	(13.0-22.0)	(16.0-23.0)	
<b>Tonnis Angle</b>			
N	11	9	0.1184 <sup>2</sup>
Mean (SD)	14.8 (4.9)	11.1 (5.2)	
Range	(7.3-22.0)	(2.4-20.0)	<sup>2</sup> Fisher's Exact Test

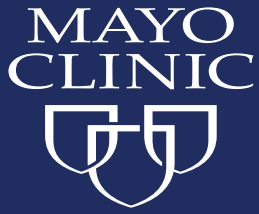


# Results:

## Table 3 Post-operative Radiographic Findings

	Failure (N=11)	Success (N=9)	p value
<b>Alpha Angle</b>			0.4201 <sup>1</sup>
N	11	9	
Mean (SD)	42.5 (10.4)	40.0 (7.4)	
Range	(32.0-61.0)	(31.0-55.0)	
<b>Center Edge Angle (LFU)</b>			0.0527 <sup>1</sup>
N	11	9	
Mean (SD)	18.5 (2.4)	22.1 (2.1)	
Range	(10.0-22.0)	(17.0-22.0)	
<b>Tonnis Angle (LFU)</b>			0.2781 <sup>1</sup>
N	11	9	
Mean (SD)	13.7 (4.7)	11.4 (4.4)	
Range	(9.0-23.0)	(5.0-18.0)	<sup>1</sup> Unequal Variance t-Test <sup>2</sup> Fisher's Exact Test





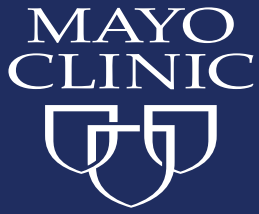
# Results:

## Table 4. DDH: Survivorship Free of Failure

Variable	Level	N	Events	Median (mos)	1-yr Rate	2-yr Rate	3-yr Rate	p-value
Overall	Overall	20	11	29	85.00%	68.65%	40.05%	NA
Gender	Female	17	9	26	82.35%	69.11%	47.39%	0.477
	Male	3	2	29	100.0%	66.67%	NA	
Labral Tear	No	3	2	57	100.0%	66.67%	66.67%	0.462
	Yes	17	9	26	82.35%	69.11%	35.54%	
Labral Debridement	No	10	2	26	100.0%	100.0%	75.00%	0.022
	Yes	10	9	47	76.92%	52.75%	17.58%	
Labral Repair	No	10	9	47	92.00%	68.33%	31.14%	0.075
	Yes	10	2	26	100.0%	100.0%	66.67%	
Femoral Osteoplasty	No	5	2	47	80.00%	80.00%	80.00%	0.389
	Yes	15	9	26	86.67%	64.20%	25.68%	
Acetabular Osteoplasty	No	13	7	47	92.31%	76.92%	52.75%	0.037
	Yes	7	4	26	71.43%	53.57%	NA	

## Conclusion

- In hips with dysplasia undergoing arthroscopic treatment patients with poor outcome were more likely to have an LCEA  $<17$  and intraoperative rim resection  $>3\text{mm}$ .
- The labral repair group did substantially better than the labral debridement group.
- In those hips doing well at short to mid-term followup, careful longer-term followup is needed to determine whether these improvements in pain and function are maintained.



# References

1. Gupta A, Redmond JM, Stake CE, Dunne KF, Domb BG. Does Primary Hip Arthroscopy Result in Improved Clinical Outcomes? 2-Year Clinical Follow-up on a Mixed Group of 738 Consecutive Primary Hip Arthroscopies Performed at a High-Volume Referral Center. *Am J Sports Med.* 2015 Jan 28.
2. Heyworth BE, Shindle MK, Voos JE, Rudzki JR, Kelly BT. Radiologic and intraoperative findings in revision hip arthroscopy. *Arthroscopy.* 2007 Dec;23(12):1295-302.
3. Clohisy JC, Carlisle JC, Beaulé PE, Kim YJ, Trousdale RT, Sierra RJ, Leunig M, Schoenecker PL, Millis MB. A systematic approach to the plain radiographic evaluation of the young adult hip. *J Bone Joint Surg Am.* 2008 Nov;90 Suppl 4:47-66.
4. Henak CR, Ellis BJ, Harris MD, Anderson AE, Peters CL, Weiss JA. Role of the acetabular labrum in load support across the hip joint. *J Biomech.* 2011 Aug 11;44(12):2201-6.
5. Fabricant PD, Fields KG, Taylor SA, Magennis E, Bedi A, Kelly BT. The effect of femoral and acetabular version on clinical outcomes after arthroscopic femoroacetabular impingement surgery. *J Bone Joint Surg Am.* 2015 Apr 1;97(7):537-43.