Leg Length Discrepancy and its Relationship to the Forgotten Joint Score in Total Hip Arthroplasty

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INTRODUCTION:

Leg length discrepancy (LLD) following total hip arthroplasty (THA) is a negative outcome that may significantly influence patient satisfaction. This study aims to compare patients with perceived LLD (P-LLD) with those without and examine the impact of P-LLD on Forgotten Joint Score (FJS).

METHODS:

We performed a retrospective analysis of elective, primary THA patients within our institution from 2016-2020. We included patients ≥18 years old and 6-12 months post THA, with available leg-length radiographic imaging. Patients were excluded for prior hip surgery, revision hip surgery, postoperative infection, postoperative periprosthetic fracture, or no 6-week follow up EOS radiographs. P-LLD and FJS data were gathered via questionnaires administered to patients 6-12 months post THA. We defined two cohorts: patients with P-LLD and patients with no P-LLD. Univariate analyses were performed between groups, and multivariate regression analyses were used to compare FJS adjusting for age and BMI.

RESULTS:

We included 110 patients, 32 of whom (29%) had a perceived LLD. The cohorts did not show differences in age (p=0.363), BMI (p=0.449), sex distribution (p=0.982), or race (p=0.287). Additionally, patients with and without P-LDD did not show any difference in postoperative measured leg length discrepancies: inter-teardrop line to greater trochanter (5.83mm vs 4.93mm, p=0.401), inter-ischial tuberosity to lesser trochanter (3.48mm vs 4.07mm, p=0.33), teardrop to tibial eminence (3.93 vs 3.67, p=0.908), teardrop to tibial plafond (2.91 vs 3.25, p=0.77). Univariate analysis showed significantly lower FJS (63.90 vs 79.35, p=0.003) in patients with P-LDD. Multivariate analyses also revealed a significantly lower FJS in P-LDD patients (OR 0.98, 95% CI: 0.96-0.99, p=0.007). Additionally, there was no correlation between perceived and measured LLD.

DISCUSSION AND CONCLUSION:

These results state that P-LDD has a clear negative relationship to FJS. Surgeons should counsel patients who are at risk for P-LDD, such as those with contractures and scoliosis, prior to THA.

Table 1. Demographics and Characteristics by Presence of Perceived Leg Length Discrepancy in Individuals Undergoing Primary Total Hip Arthroplasty (N=110)

Variable	P-LDD (N=32)	No P-LDD (N=78)	p-value
Age	64 ± 8.59	62 ± 11.27	0.363
BMI	29.21 ± 6.03	28.26 ± 5.46	0.449
Sex			0.982
Female	14 (0.44)	34 (0.44)	
Male	18 (0.56)	44 (0.56)	
Smoking History			0.712
No	19 (0.59)	51 (0.65)	
Yes	13 (0.41)	27 (0.35)	
Preoperative Opioid Prescription			0.971
No	29 (0.91)	61 (0.78)	
Yes	3 (0.09)	17 (0.22)	
Race			0.287
Asian	0 (0.00)	1 (0.01)	
Black	3 (0.09)	2 (0.03)	
White	29 (0.91)	75 (0.96)	
Ethnicity			0.854
Hispanic	2 (0.06)	3 (0.04)	
Non-Hispanic	30 (0.94)	75 (0.96)	
FJS	63.90 ± 26.08	79.35 ± 23.89	0.003
Postoperative Inter-Teardrop Line to Greater Trochanter LLD	5.83 ± 4.91	4.93 ± 4.08	0.401
Postoperative Inter-ischial Tuberosity Line to Lesser Trochanter LLD	3.48 ± 2.66	4.07 ± 3.01	0.330
Postoperative Teardrop to Tibial Eminence LLD	3.93 ± 4.49	3.67 ± 3.62	0.908
Postoperative Teardrop to Tibial Plafond LLD	2.91 ± 2.07	3.25 ± 3.25	0.770
Column data reported as Mean ± SD or number of patients (%)			

Table 2. Multivariate Analyses for Presence of P-LDD on FJS in Individuals Undergoing Primary Total Hip Arthroplasty (N=110)

Variable	OR	CI	p-value
FJS	**0.98**	**0.96-0.99**	**0.007**
Age	1.04	0.98-1.09	0.205
BMI	1.03	0.94-1.13	0.478
Postoperative Inter-Teardrop Line to Greater Trochanter LLD	1.05	0.94-1.17	0.399
Postoperative Inter-ischial Tuberosity Line to Lesser Trochanter LLD	0.88	0.72-1.07	0.192
Postoperative Teardrop to Tibial Eminence LLD	1.01	0.89-1.14	0.850
Postoperative Teardrop to Tibial Plafond LLD	0.89	0.73-1.07	0.208