Patients with Significant Femoral Version Abnormalities Report Lower Quality of Life than Asymptomatic Controls

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INTRODUCTION:
Symptomatic femoral malrotation can significantly affect one's quality of life enough to seek surgical correction. Currently, there is no established baseline quality of life for such patients. The primary aim of this study was to establish the quality of life deficit using the Limb Deformity (modified) Scoliosis Research Society (LD-SRS) and Patient-Reported Outcomes Measurement Information System (PROMIS) for patients with symptomatic femoral rotation abnormality versus adults with no symptomatic lower extremity complaints.
METHODS:
An operative log search identified all patients at least 18 years of age scheduled for unilateral or bilateral femoral derotation osteotomy with intramedullary nail fixation between December 2018 and August 2022. Patients were indicated for rotational correction based on history, physical examination, and computerized tomography (CT) study. Because this study examines exclusively preoperative quality of life, patients need not have had surgery and no follow-up is necessary. Patients were excluded if they were under 18 years old, they did not complete the LD-SRS and PROMIS surveys, or rotational correction was not a primary patient complaint. Patients scheduled for correction of concurrent tibial malrotation were included. This yielded 23 patients. A control cohort was created by using LD-SRS and PROMIS scores from 33 volunteers with no history of lower extremity surgery, previously surveyed through convenience sampling. A Student's T test compared survey scores between the two groups ($p<0.05$ significance). A Shapiro-Wilk test assessed the normality of age distribution for both groups. A Chi-squared test was used for a sex comparison between the two groups (given there were greater than five subjects in each group), and a Fisher's exact test compared self-reported race between the rotation and control groups (given there were fewer than five subjects in some of the groups).
RESULTS:
Demographic comparisons between the rotational group vs. controls identified cohort matching for age ($p=0.458$) and sex ($p=0.565$). There was a significantly higher number of individuals self-identifying as Asian/Pacific Islander in the control group and a significantly higher number of patients self-identifying as White in the rotational group ($p=0.005$). Patients with femoral malrotation reported significantly worse scores than control subjects on all survey domains, both for LD-SRS [Total (3.48 ± 0.69 vs. 4.58 ± 0.37, $p<0.001$); Function/Activity (3.50 ± 0.81 vs. 4.44 ± 0.4, $p<0.001$); Mental Health (3.42 ± 0.91 vs. 4.30 ± 0.73, $p<0.001$); Pain (3.55 ± 0.93 vs. 4.81 ± 0.31, $p<0.001$); Self-Image/Appearance (3.41 ± 0.81 vs. 4.75 ± 0.43, $p<0.001$)] and PROMIS [Function (41.00 ± 7.47 vs. 60.00 ± 7.28, $p<0.001$); Pain Intensity (46.00 ± 8.51 vs. 33.70 ± 4.89, $p<0.001$); Pain Interference (57.00 ± 9.34 vs. 42.80 ± 6.60, $p<0.001$); Global Mental Health (48.70 ± 9.51 vs. 55.30 ± 7.81, $p=0.006$); Global Physical Health (45.60 ± 7.32 vs. 58.20 ± 7.07, $p<0.001$).
DISCUSSION AND CONCLUSION: Patients with symptomatic femoral malrotation experience significantly worse quality of life as determined by all LD-SRS and PROMIS domains, versus healthy controls. The use of these surveys can assist with confirming whether patients are likely to benefit from surgical intervention for symptomatic femoral rotation abnormality. They may also help patients understand in what ways they may derive improved quality of life following surgery.