Introduction/Objectives

The presence of patella alta is ubiquitous in the spastic cerebral palsy (CP) population. Though it is commonly asymptomatic, the alta position of the patella is not inconsequential and certainly representative of the underlying motor disorder and altered biomechanics. There is a relationship between anterior knee pain and patella alta, however the nature of the interaction has yet to be fully characterized. Contemporary literature fails to delineate the natural history of patella alta in the ambulant child with CP. Without a defined natural history, efficacy of surgical intervention to ameliorate patella alta remains unclear. The objectives of this study are to describe the natural history of patella alta in children with CP who proceed on to surgical intervention for gait disorders and to determine whether surgical intervention alters the natural history of patella alta.

Methods

A retrospective review of a convenience sample of children with symmetric spastic CP seen in the outpatient clinic between August 1999 and February 2013 were reviewed by a single orthopedic surgeon for inclusion in the study cohort. Fifty-six out of 728 children reviewed met inclusion criteria. Exclusion criteria included: a pattern of involvement other than symmetric spastic CP, incomplete medical records or radiographic data, surgical intervention that was different side to side and surgical intervention at an outside facility. Subjects were divided into surgical and nonsurgical groups in reference to procedures performed about the knee, inclusive of rectus femoris and/or hamstring interventions, in an effort to correct gait deviations without attempts to alter the position of the patella. The presence or absence of patella alta, as designated by the Kushino-Sugimoto index, was recorded for serial radiographs of each subject. Z-scores were calculated per limb per subject at each time point. Progression of patella alta was then followed over time and odds ratios were calculated using generalized estimating equations and linear regression analysis, where needed.

Results

22 of 56 subjects (39.3%) comprised the surgical group. 88.6% of the limbs with patellar alta on initial radiographic evaluation compared to 52.9% of limbs in the non-surgical group. The odds ratio between the two groups, 6.944, was statistically significant (p = .0370). This suggests surgical intervention, in comparison to non-operative management, decelerates the progression of patella alta in this cohort of subjects.

Discussion/Conclusions

Patella alta, as defined by the Kushino-Sugimoto index, was identified in 67% of the study population. While there is a higher incidence of alta in children with CP who proceed on to surgical intervention about the knee, the progression of patella alta halted post surgically. Those children who did not undergo surgery about the knee have a higher incidence of pathologically increased patellar height over time. Therefore, surgical intervention about the knee in this subject population can affect the natural history of patella alta.