The Tension of the Iliopsoas Tendon More Than Doubles During Extension of the Dysplastic Hip in Open Reduction

Edward Stephen Mojica, Juan María Pardo García[1], Nathan Alexander Huebschmann[2], Pablo Castaneda[3]
[1]Hospital Universitario Doce De Octubre, [2]NYU Grossman School of Medicine, [3]NYU Orthopaedic Hospital

INTRODUCTION: The role of the iliopsoas as an obstructing and re-dislocating factor in developmentally dislocated hips (DDH) is unclear. Although the increase in tension of the iliopsoas tendon in extension compared to flexion is a well-known phenomenon, quantitative proof is lacking. The purpose of this study is to determine the change in the tension of the iliopsoas tendon during flexion and extension when performing an open reduction.

METHODS: We evaluated 34 hips undergoing an anterior open reduction for a developmental dislocation. A prospective review of the electronic medical record identified all patients indicated to undergo anterior open reduction. All hips were dislocated and classified using the International Hip Dysplasia Institute (IHDI) classification scheme as type III and IV. At the time of surgery, we identified the iliopsoas tendon, and before sectioning it as part of the open reduction, connected it to a tensiometer. Following reduction of the femoral head, a constant tension equivalent to 20 N (5lbs) was produced at a baseline of 90° of flexion. The hip was then manually held in flexion and subsequently in extension through 10 cycles from flexion of 90° to extension of -20°. We recorded the change in tension between these different stations of hip motion. We performed statistical analyses using Pearson and Spearman correlation tests.

RESULTS: We created an initial tension artificially at 20 N with the hip held in 90° of flexion. This tension more than doubled to a mean of 42 N when placed in extension. We found a significant increase in tension when the hip went below 20° of flexion. Mean tension along the 110° arc of motion is displayed in Figure 1. We found the Spearman correlation between the angle of the hip and the force of tension to be statistically significant (p=0.003).

DISCUSSION AND CONCLUSION: This study provides quantitative support that the tension of the iliopsoas tendon increases significantly in extension when performing an open reduction of a developmentally dislocated hip.

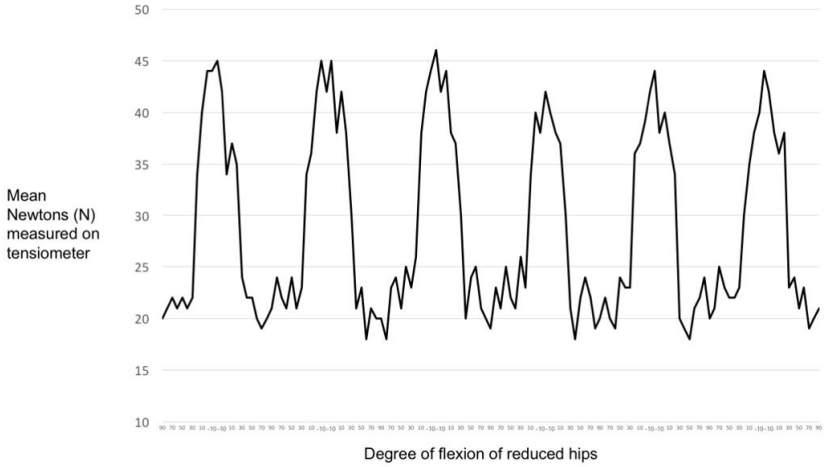

Figure 1. Tension of the iliopsoas tendon at varying degrees of flexion and extension of reduced hips.