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How does Patellar Tendon Advancement alter the Knee Extensor Mechanism in Children Treated for Crouch Gait?

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Abstract:

Background: The patellar tendon advancement (PTA) procedure, often coupled with a distal femoral extension osteotomy (DFEO), is increasingly used to treat persistent crouch gait. In this study, we investigated relationships between patellar position, knee flexion, and the patellar tendon moment arm in children treated with the DFEO and PTA procedures.

Methods: We retrospectively analyzed pre- and post-operative radiographs and gait metrics from 63 knees that underwent DFEO and PTA procedures at Gillette Children's Specialty Healthcare. A computational musculoskeletal model of the knee was used to simulate the PTA procedure and predict the effects on the patellar tendon moment arm.

Results: Approximately 80% of the knees exhibited patella alta prior to surgery. Post-operatively, 86% of the knees exhibited patella baja. The surgically altered patella position produced a 13% increase in the patellar tendon moment arm in extended knee postures, which

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