The Influence of Peri-Operative Nerve Block on Strength and Functional Return to Sports After Anterior Cruciate Ligament Reconstruction

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Abstract

Background: Patients often present with quadriceps or hamstring weakness following anterior cruciate ligament reconstruction (ACLR), despite postoperative physical therapy regimens; however, little evidence exists connecting nerve blocks and ACLR outcomes.

Purpose: The purpose of this study was to compare muscle strength at return-to-play in patients who received a nerve block with ACLR, and whether a specific block type affected functional outcomes.

Study Design: Retrospective cohort study

Methods: Patients were recruited 5-7 months following primary, isolated ACLR and completed bilateral isokinetic strength tests of the knee extensor/flexor groups as a single session return-to-sport test. Strength was expressed as torque normalized to mass (Nm/kg) and limb-symmetry-index (LSI) as involved/uninvolved torque. Chart review determined the type of nerve block and graft used. Nerve block types were classified as Knee Extensor Motor (femoral nerve), Knee Flexor Motor (sciatic nerve), or Isolated Sensory (adductor canal block/saphenous nerve). A one-way ANCOVA controlling for graft-type was used.

Results: A total of 169 patients were included. Graft type distribution: 102 (60.4%) ipsilateral bone patellar tendon bone (BTB), 67 (39.6%) ipsilateral hamstring (HS) tendon. Nerve block type distribution: 38 (22.5%) femoral, 25 (14.8%) saphenous, 45 (26.6%) femoral and sciatic, 61 (36.1%) saphenous and sciatic. No significant difference was found in knee extensor strength (p = 0.113) or symmetry (p = 0.860) between patients with Knee Extensor Motor blocks (1.57±.048

Nm/kg, 70.1±0.18%) and those without (1.47±.047 Nm/kg, 69.6±.018%). A significant difference was found between patients with Knee Flexor Motor blocks (0.83±.027 Nm/kg) and those without (0.92±.027 Nm/kg) for normalized knee flexor strength ($p = 0.021$), but not knee flexor symmetry ($p = 0.592$).

Conclusion: Our data shows that use of a sciatic nerve block with ACLR in patients with HS and BTB grafts influences persistent knee flexor strength deficits at time of return-to-sport. Although the etiology of postoperative muscular weakness is multifactorial, this study adds to the growing body of evidence suggesting that peri-operative nerve block affect muscular strength and functional rehabilitation after ACLR.