Risk Factors for Venous Thromboembolism following Anterior Cruciate Ligament Reconstruction

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INTRODUCTION:
Anterior cruciate ligament (ACL) reconstruction is a common procedure performed in a relatively young patient population. Venous thromboembolisms (VTE, comprising deep vein thromboses and/or pulmonary emboli) are a rare but serious adverse event for such patients. Due to the low incidence of VTE following ACL reconstruction, limited information is available regarding its incidence and risk factors.
Past studies have found age and chronic oral contraceptive pill (OCP) usage to be significant risk factors, but many comorbidities, such as clotting risk factors have not been investigated due to limitations in databases used and/or sample size. The present study sought to determine the incidence, timing, and risk factors of VTE following ACL reconstruction from a large, national cohort.
METHODS:
Patients who underwent ACL reconstruction were identified in a 2010- 2020 M91Ortho administrative database. Patients were tracked for 90 days following their surgery, and the incidence and timing of VTE relative to reconstruction was determined.
Patient characteristics were abstracted, including: age, sex, Elixhauser Comorbidity Index (ECI), clotting risk factors (antiphospholipid syndrome, Factor V Leiden, history of prior VTE), any concomitant procedures (meniscal debridement, meniscal repair, medial collateral ligament repair, posterior crucial ligament repair), and medications (oral contraceptive pills, corticosteroids). These were assessed and compared between without and with VTE using univariate and multivariate analyses.
RESULTS:
Of 145,005 patients undergoing ACL reconstruction, VTE within 90 days of surgery was noted for 274 (0.19%). In terms of timing, 55.1% occurred within the first two weeks, and 79.1% occurred within the first month.
On multivariate analyses, independent predictors for VTE in decreasing order of odds ratio (OR) included: prior VTE (OR: 14.25), Factor V Leiden (OR: 11.71), antiphospholipid syndrome (OR: 5.04), concomitant meniscus repair (OR: 1.42), increasing age (OR: 1.30 per decade), and increasing ECI (OR: 1.11 per point) ($p<0.05$ for each). Other concomitant procedures (PCL repair, MCL repair, meniscus debridement), corticosteroid usage, and OCP usage were not shown to be associated with increase odds of VTE ($p> 0.05$ for each).
DISCUSSION AND CONCLUSION:
Following ACL reconstruction, the incidence of VTE was low, as expected (0.19%), but over half of those that did occur were within two weeks of surgery. Risk factors were identified included specific clotting risk factors, concomitant meniscal repair, and increasing age as well comorbidity burden. Notably, other concomitant procedures and OCPs usage were not found to be associated with increase odds of VTE. The greatest risk was in those with defined clotting risk factors and chemoprophylaxis should strongly be considered in at least said patients.