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### Severity of Chronic Venous Insufficiency on Primary Total Knee Arthroplasty Outcomes

**Background:** Over 700,000 people in the United States undergo total knee arthroplasty (TKA) each year with a large projected increase. CVI affects 10-35% of adults in the U.S. and is associated with venous hypertension, valvular damage, or venous obstruction, resulting in slow-healing leg ulcers with high rates of recurrence. Previously, CVI in TKAs has been associated with poorer patient outcomes; however, we found no study differentiating CVI severity.

**Objective:** Evaluate risk-factors and TKA outcomes in patients with varying CVI severity.

**Methods:** This retrospective study analyzed TKA outcomes within the Ochsner healthcare system from 2011 to 2021 using patient-specific codes. Analysis included short-term complications (<90 days post-operative), long-term complications (<2 years), and CVI status (yes/no; simple/complex/unspecified). Complex CVI indicated presence of pain, ulceration, inflammation, and/or other complications. Revisions within 2 years post-TKA were assessed. A hospital emergency visit within 90 days of TKA was considered a readmission. Statistical analysis was conducted using R statistical software version 4.0.2. Multivariable logistic regression was performed to predict complication (any/long/short) as a function of CVI status (yes/no; simple/complex) and other potential confounding variables. Unspecified CVI was considered simple, complex, or not included in variable analyses.

**Results:** Of 7,665 patients analyzed, 677 (8.8%) had CVI. Among CVI patients, 248 (33.4%) had simple CVI, 233 (31.4%) had complex CVI, and 261 (35.2%) had unspecified CVI. Public insurance ( $p=0.011$ ), older age ( $p<0.001$ ), higher adjusted CCI ( $p<0.001$ ), higher BMI ( $p<0.001$ ), year of surgery ( $p<0.001$ ), and readmissions ( $p=0.033$ ) were associated with CVI. No difference was seen in CVI versus control in composite complication ( $p=0.157$ ), short-term complication ( $p=0.135$ ), long-term complication ( $p=0.182$ ), or revision ( $p=1.0$ ). Composite complication rates were 12.1% without CVI, 16.3% with complex CVI, and 8.9% with simple CVI. Complication rates differed only between simple and complex CVI post-adjustment ( $p=0.038$ ). Recent TKAs, independent of CVI, had fewer complications ( $p=0.001$ ).

**Discussion:** Patients with all types of CVI had no higher risk of TKA complications compared to those without CVI. If CVI was present, complex CVI significantly correlated to greater composite complications compared to simple CVI. Further studies are necessary to evaluate differences from prior literature. CVI prevalence has increased in TKAs, yet composite complications decreased over time which may indicate improved surgical care over time. We demonstrate that CVI is associated with other comorbidities that correlate to TKA complications.

**Conclusions:** Patients with complex CVI are at higher risk for post-TKA complications compared to simple CVI. Overall, CVI did not affect post-op complications versus control.