Efficacy of the "Popliteal Compression Test" in Detecting Intraoperative Popliteal Artery Injury During Knee Arthroplasty

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Knee arthroplasty for severe arthritis is being frequently performed worldwide in varied clinical settings due to increased patient awareness and longer life expectancy. Intraoperative vascular injury during this surgery is a rare but catastrophic complication which has to be identified at the earliest. Current detection methods, like CT Angiogram entail delayed diagnosis, specialist equipment and personnel. This study measures the efficacy of a novel cost-effective intraoperative clinical test performed by the surgeon which can accurately detect vascular transection. 200 consecutive patients admitted for elective knee arthroplasty in single specialist hospital were enrolled in the study preoperatively, after informed consent. Demographic, anthropometric and comorbidities data were collected. All patients underwent the test intraoperatively and positive findings were followed by confirmatory angiogram. 3 out of 200 patients had positive test result of which 2 patients needed open vascular repair. The test has high sensitivity, specificity, precision, and F1 score. Chi-square test failed to reject null hypothesis (df =1, p=0.05,chi-square value(0.0051)<critical value(3.841)), implying the test's performance aligns with expected outcomes. Logistic regression (at p<0.01) revealed no significant association between patient-specific variables and test result, supporting its universal applicability in all knee arthroplasty patients with consistent accuracy. The Popliteal compression test accurately detects vascular injury intraoperatively and is invaluable in planning repair within the critical revascularisation period. This test is especially beneficial in resource-limited clinical settings and can improve the safety and success of this complex surgery.

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