ABSTRACT

Introduction

Periarticular infiltration is widely used in total knee arthroplasty as part of enhanced recovery protocols to improve pain control and reduce opioid consumption. The addition of vasoconstrictors may prolong local anesthetic effect and decrease bleeding; however, concerns persist regarding potential impairment of tissue perfusion, delayed wound healing, and increased infection risk.

Theoretical Framework

Epinephrine induces transient local vasoconstriction, reducing capillary blood flow and potentially limiting hematoma formation. While this may be beneficial in reducing postoperative bleeding, theoretical concerns suggest that excessive or prolonged vasoconstriction could compromise soft-tissue perfusion and increase wound complications or periprosthetic joint infection (PJI). Prospective safety data are necessary to evaluate whether PVI alters infection risk.

Objective

To prospectively evaluate safety of PVI in primary TKA, assessing wound complications at 90-days and PJI rates at one year, compared with a consecutive control cohort without vasoconstrictor use.

Materials and Methods

A prospective cohort of 70 primary TKAs receiving PVI with a standardized mixture containing 0.9% saline and epinephrine was analyzed. Outcomes were compared with a consecutive cohort of 70 primary TKAs performed prior without epinephrine.

Primary endpoint was a 90-day wound-complication composite. Secondary outcomes included PJI at 90 days and one year, readmission, and reoperation. Multivariable adjustment accounted for baseline characteristics and tourniquet time.

Results

Baseline demographic and surgical variables were comparable between groups.

The 90-day wound-complication rate was 5% in the PVI group versus 4.3% in controls (p = 0.78).

No significant difference was observed in superficial surgical-site infection rates.

PJI at one year occurred in 0.7% of the PVI group and 0.7% of the control group (p = 1.00).

Readmission and reoperation rates were similar.

Conclusion

In this prospective case series, PVI did not demonstrate an increased rate of wound complications or PJI at one year. These findings suggest that PVI appears clinically safe.