Comparison of Adhesive Wound Closure Systems in Total Joint Arthroplasty

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INTRODUCTION: Allergic contact dermatitis (ACD) from adhesive wound closure systems has garnered particular attention for its potential role in increasing wound complications in Total Joint Arthroplasty (TJA). This study, at a single high volume joint replacement institution, investigates the incidence of wound complications among two adhesive systems: a liquid self-adhering mesh adhesive (LSMA) and a silk-fibroin adhesive (SFA).

METHODS:

A retrospective review from January 2019 to April 2024 identified all TJAs with at least 6 weeks post-operative follow-up. Collected data included demographics (age, gender, American Society of Anesthesiologists [ASA] classification, and body mass index [BMI]) and surgical outcomes. Comorbidities affecting wound healing, such as peripheral vascular disease, nutritional deficiency, ACD, wound topical steroid use, and emergency department visits within seven days post-operation, were documented. Statistical analyses were performed using chi-square tests and t-tests.

RESULTS:

A retrospective review identified 1,014 patients (794 LSMA and 220 SFA). A sample size of 75 subjects per cohort was calculated to achieve a power above 95%. The patient population was 49% female and 51% male, with a mean age of 65.57 (SD 9.25) and a mean BMI of 28.3 (SD 4.70).

Bivariate analyses revealed no significant differences in demographics or comorbidities between the LSMA and SFA cohorts, except for female gender (47.5% vs 55.9%, p=.034). The LSMA cohort exhibited higher incidences of ACD (4.8% vs 0%, p=.001), surgical wound topical steroid use (2.9% vs 0%, p=.01), and emergency department visits within seven days (2.2% vs 0%, p=.024) than the SFA cohort.

DISCUSSION AND CONCLUSION: There is a very low incidence of wound complications in TJA when utilizing the SFA for wound closure. There was a statistically significant increase in ACD when utilizing the LSMA wound closure system. SFA may be a superior wound closure option to consider in the care of patients undergoing TJA.