"Risk-Stratified Cost-Effectiveness of PICO Dressings in Sternotomy Patients Using the Brompton & Harefield Infection Score"

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Background

Sternal wound infection (SWI) after sternotomy carries morbidity and cost implications. Negative pressure dressings such as PICO are widely used, though cost-effectiveness remains uncertain. The Brompton & Harefield Infection Score (BHIS) stratifies patients by SWI risk. This study aimed to describe our sternotomy cohort, evaluate the association between BHIS and infection, and assess potential cost-effectiveness of PICO across BHIS strata.

Methods

We retrospectively analysed 470 sternotomy patients (2018–2024) at Galway University Hospital, all of whom received PICO. Demographics, comorbidities, BMI, and BHIS were recorded. Confirmed SWI cases formed the wound subgroup. Wound and non-wound patients were compared. Cost-effectiveness modelling assumed PICO €175 (NHS prices) and SWI treatment €12,700 (NHS estimate). Minimum baseline infection rates required for PICO to be cost-saving were derived and compared with published non-PICO BHIS rates.

Results

The wound subgroup (n=18, 3.8%) included more females (39% vs 22%), higher BMI (31.4 vs 29.4 kg/m²), more diabetes (44% vs 26%) and heart failure (33% vs 18%). Mean BHIS was higher (2.39 vs 1.40, p=0.039). BHIS distribution was 57% low, 34% medium, 9% high, with fewer low-risk patients than published CABG series (~65% low; χ^2=15.8, p<0.001). Observed SWI rates with PICO were 2.5% (low), 3.8% (medium), and 12.8% (high). Modelling indicated PICO may only be cost-saving if baseline (no-PICO) SWI rates exceed 3.9% (low), 5.2% (medium), and 14.1% (high). Published data report 2.6%, 6.0%, and 16.0%, respectively, suggesting cost-effectiveness in medium- and high-risk but not low-risk strata.

Conclusions

Patients with SWI had higher BHIS than those without infection. Routine PICO use may not be cost-effective, but may be cost-saving in medium- and high-risk groups. BHIS may guide targeted PICO use and earlier escalation in highest-risk patients, supporting broader cardiac surgical application.

Biography:
Dr Eiran Gannon is a junior doctor in his first year of clinical practice at Galway University Hospital, Ireland. He has a strong interest in cardiothoracic surgery and intends to pursue a career in this specialty. He is actively developing his academic portfolio through research in cardiac surgery and related fields, with a particular focus on surgical outcomes and innovation.