

## Closed Incision Negative Pressure Therapy Dressing as an Approach to Manage Closed Sternal Incisions in High-Risk Cardiac Patients: A Multi-Centre Study in the UK

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**Abstract :** Objective: Sternal wound infection (SWI) following cardiac operation has a significant impact on patient morbidity and mortality. It also contributes to longer hospital stays and increased treatment costs. SWI management is mainly focused on treatment rather than prevention. This study looks at the effect of closed incision negative pressure therapy (ciNPT) dressing to help reduce the incidence of superficial SWI in high-risk patients after cardiac surgery. The ciNPT dressing was evaluated at 3 cardiac hospitals in the United Kingdom". Methods: All patients who had cardiac surgery from 2013 to 2021 were included in the study. The patients were classed as high risk if they have two or more of the recognised risk factors: obesity, age above 80 years old, diabetes, and chronic obstructive pulmonary disease. Patients receiving standard dressing (SD) and patients using ciNPT were propensity matched, and the Fisher's exact test (two-tailed) and unpaired T-test were used to analyse categorical and continuous data, respectively. Results: There were 766 matched cases in each group. Total SWI incidences are lower in the ciNPT group compared to the SD group (43 (5.6%) vs 119 (15.5%),  $P=0.0001$ ). There are fewer deep sternal wound infections (14(1.8%) vs. 31(4.04%),  $p=0.0149$ ) and fewer superficial infections (29(3.7%) vs. 88 (11.4%),  $p=0.0001$ ) in the ciNPT group compared to the SD group. However, the ciNPT group showed a longer average length of stay ( $11.23 \pm 13$  days versus  $9.66 \pm 10$  days;  $p=0.0083$ ) and higher mean logistic EuroSCORE ( $11.143 \pm 13$  versus  $8.094 \pm 11$ ;  $p=0.0001$ ). Conclusion: Utilization of ciNPT as an approach to help reduce the incidence of superficial and deep SWI may be effective in high-risk patients requiring cardiac surgery.

**Keywords :** closed incision negative pressure therapy, surgical wound infection, cardiac surgery complication, high risk cardiac patients

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