

Utilizing Novel Transforming Powder Dressing to Avoid Explantation of Cardiovascular Implantable Electronic Devices (CIED)

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Symposium on Advanced Wound Care (SAWC) Spring 2024 Meeting | Orlando, FL

INTRODUCTION

The use of cardiac implantable electronic devices (CIEDs) has risen significantly in recent years.¹ In the United States alone, more than 300,000 people undergo surgical implantation of new CIEDs for treatment of cardiac arrhythmias each year.² CIED related infections are estimated to occur at a rate of 1 to 2%, and are increasing in proportion to the rate of new CIED implantations.² Infections often necessitate explantation of the devices, posing substantial additional risks to the patient and costs to the healthcare systems.³

METHODOLOGY & MATERIALS

This series reports four patients who developed localized soft tissue infections with partial wound dehiscence after CIED insertion and were recommended to undergo explantation of their devices with contralateral system implantations. Two patients had a pocket hematoma. All four underwent echocardiograms with no vegetations, blood cultures without bacteremia, and completed treatment with courses of oral antibiotics without fevers. All elected serial wound care dressings with transforming powder dressing (TPD*) rather than having CIED system explantation.³

TPD is a commercially available extended wear dressing comprised primarily of biocompatible polymers similar to those used in contact lenses. When hydrated with saline, TPD aggregates to form a moist, oxygen-permeable barrier that covers and protects the wound while releasing excess exudate through vapor transpiration. TPD may be left on the wound for up to 30 days without requiring primary dressing changes.

REFERENCES

1. Sohail MR, Eby EL, Ryan MP et al. Incidence, Treatment Intensity, and Incremental Annual Expenditures for Patients Experiencing a Cardiac Implantable Electronic Device Infection. Evidence from a Large US Payer Database 1-Year Post Implantation. Circulation: Arrhythmia and Electrophysiology. Vol 9, Issue 8, August 2016.
2. Heart Rhythm Society. New Study Reveals Need for Increased Patient Education on Cardiac Implantable Electronic Devices. 2019 Press Release/Statements. Accessed online 30DEC2023.
3. Baddour LM, Esquer Garrigos Z, Sohail MR, Havers-Borgersen E, Krahn AD, Chu VH, Radke CS, Avari-Silva J, El-Chami MF, Miro JM, DeSimone DC, on behalf of the American Heart Association Council on Clinical Cardiology. Update on cardiovascular implantable electronic device infections and their prevention, diagnosis, and management: a scientific statement for the American Heart Association. Circulation. 2023;148:e-10.1161/CIR.0000000000001187

RESULTS

Four patients (50% male / female, ages 35-79 years) that opted for TPD treatment rather than surgical explanations were treated with TPD. Even with the presence of infection or hematomas, all four surgical wounds healed in fewer than 6 weeks with 2 to 7 TPD applications (once every 8 days on average), avoiding CIED system explantations. No complications were observed.



Patient	Age / G	Procedure	Comorbidities						Wound Complications		TPD Treatments		
			DM	BMI	Smoking	CAD	CKD	Immuno Steroid	Infection	Hematoma	TPD Applications	Days Between Applications	Time to Heal (Days)
1	74 / M	DPM	N	26	N	Y	Y	N	Y	Y	7	6	42
2	67 / F	DPM	N	33	N	N	N	UC	N	Y	2	12	24
3	79 / F	DPM	Y	26	Y	N	N	N	Y	N	3	7	21
4	35 / M	DPM Gen	N	35	Y	N	N	N	Y	N	3	7	21

DPM = dual pacer, DPM Gen = dual pacer generator change, UC = ulcerative colitis, DM = Diabetes, CAD = Coronary Artery Disease, CKD = Chronic Kidney Disease, Immuno = Immunocompromised Status

DISCUSSIONS

Based on the outcomes, we conclude that when surgical wound infection develops after CIED implants, and no vegetations or evidence of bacteremia are observed, CIED superficial wound infections may be effectively managed with TPD treatment without compromising healing outcomes. These results demonstrate that nonoperative methods of wound closure are feasible, pose less risk to the patient, and offer a significantly less costly alternative to CIED system explantation with contralateral system implantation.