

Driveline insulation as a conduit for left ventricular assist device pocket infection

Mamatha Pinninti, MD, Vinay Thohan, MD, and Nasir Z. Sulemanjee, MD, Milwaukee, Wis

From Aurora Cardiovascular Services, Aurora Sinai/Aurora St Luke's Medical Centers, University of Wisconsin School of Medicine and Public Health, Milwaukee, Wis.

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Address for reprints: Nasir Z. Sulemanjee, MD, Aurora Cardiovascular Services, 2801 W Kinnickinnic River Parkway, #840, Milwaukee, WI 53215 (E-mail: publishing107@aurora.org).

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Although sepsis is generally restricted to the early postoperative period,¹ late-onset left ventricular assist device (LVAD) driveline infections are major determinants of quality of life and survival. We report an unusual case of late-onset LVAD pocket infection extending through the driveline insulation.

CLINICAL SUMMARY

A 71-year-old woman presented with severe ischemic cardiomyopathy, left ventricular ejection fraction

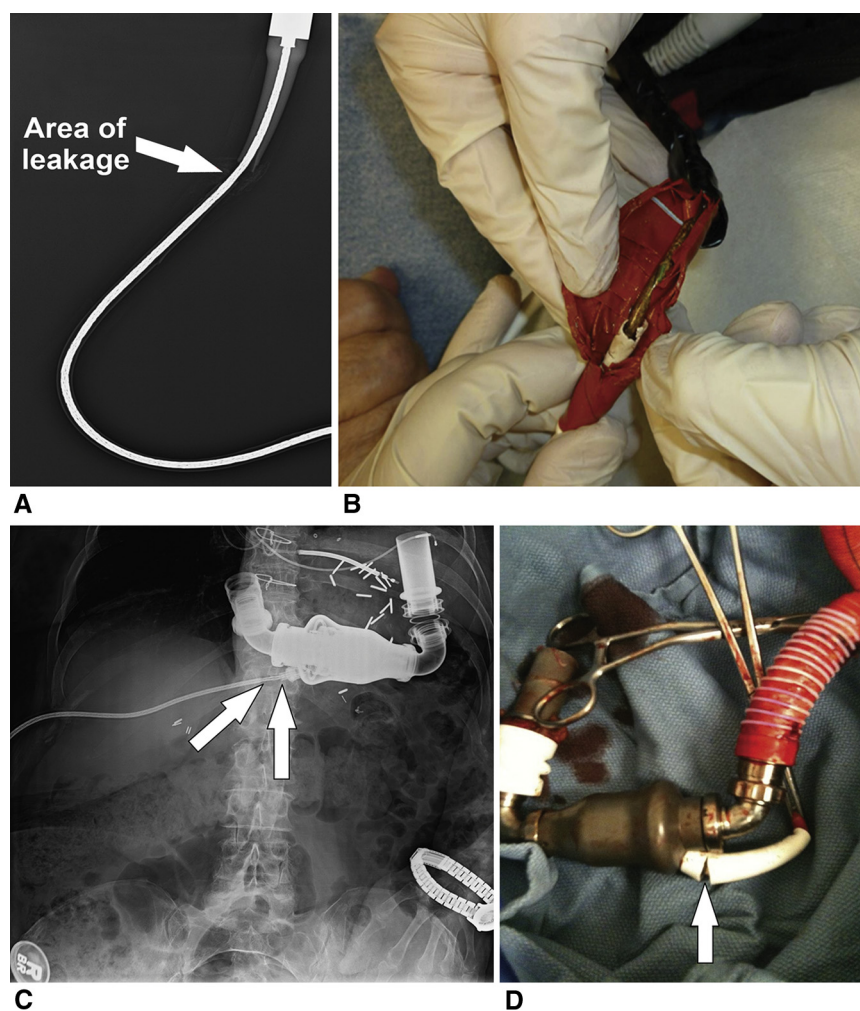


FIGURE 1. Depiction of HeartMate II (Thoratec Corp, Pleasanton, Calif) LVAD driveline fracture. A, X-ray image shows the break in the distal driveline close to the controller. B, Photograph shows drainage exiting between the inner and outer sheaths at the distal broken area of the driveline. X-ray image (C) and postoperative image (D) show the break in the proximal strain relief of the driveline.

of 20%, and refractory New York Heart Association class IV symptoms. Her medical history included mitral valve replacement, coronary artery disease treated with percutaneous stents, diabetes mellitus, paroxysmal atrial fibrillation, secondary pulmonary hypertension, chronic obstructive pulmonary disease, and morbid obesity. An atrial synchronized biventricular implantable cardioverter-defibrillator was in place. She underwent HeartMate II (Thoratec Corp, Pleasanton, Calif) LVAD implantation in early 2010 as destination therapy. At the time of implant, she was at Interagency Registry for Mechanically Assisted Circulatory Support stage 4. The postoperative course was uneventful; she returned home with family and was able to perform daily activities independently.

Three-and-a-half years after implantation, the patient presented for routine evaluation and was found to have a distal driveline laceration (close to the strain relief and system controller) with no electrical alarms or pump malfunction alerts with manipulation. The laceration was sealed with insulating electrical tape. Two months later, she presented with a foul-smelling greenish-brown fluid draining from the same distal driveline site previously repaired. Further radiologic investigation demonstrated proximal strain relief separation (Figure 1) with drainage tracking between the inner and outer sheaths of the driveline, exiting at the distal broken area of the driveline. She was admitted to the hospital for suspicion of pump pocket infection for intravenous antibiotics; both blood and driveline exudate cultures revealed *Klebsiella pneumoniae* and polymicrobial infection. The patient underwent exchange of HeartMate II LVAD and explantation of biventricular implantable cardioverter-defibrillator and leads.

DISCUSSION

Driveline infections are among the most common late complications in patients with LVAD. There is a direct relationship between incidence and duration of LVAD support.^{2,3} Documented trauma from tension and torque at the exit site, larger body surface area, and

younger age are identified risk factors for driveline infections.⁴ Our patient is obese; however, she did not have pump migration but was found to have separation of the proximal strain relief from the pump. This opening likely filled with pump pocket secretion, which then tracked downward between the inner and outer sheaths of the driveline. The secretions initially may have been sterile but later became superinfected after the distal bend relief was lacerated and repaired with tape. Closure of this exit site resulted in an ascending infection to the proximal strain relief and pump pocket, resulting in bacteremia.

CONCLUSIONS

Our patient experience demonstrates that driveline infection does not always originate from the cutaneous exit sites. To our knowledge, this is the first case of pump pocket infection and bacteremia resulting from an ascending infection tracking to the LVAD pocket within the driveline. Driveline integrity is commonly compromised, and as long as no alarms or pump malfunctions can be re-created with manipulation, it is the practice of most programs to repair these with insulated electrical tape. Our case demonstrates that vigilance and infection surveillance may be warranted after repair of driveline lacerations. Finally, additional mechanical strengthening of the proximal strain relief junction or compartmentalization of the intracorporeal portion of the driveline could prevent ascending infections from reaching the pump in the event of breakage in the distal driveline.

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