

# Retained left ventricular assist device driveline in a heart transplant recipient: A case report



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Retained left ventricular assist device driveline velour.

## CENTRAL MESSAGE

Recurrent infections post-LVAD explantation should not be dismissed as mere infections of the skin driveline interface. Although rare, retained driveline velour must be considered as a possible etiology.

▶ Video clip is available online.

Left ventricular assist devices (LVADs) are commonly used as bridges to transplantation.<sup>1</sup> Although the incidence of LVAD complications has decreased with device advancement, adverse events are still common. According to the most recent Interagency Registry for Mechanically Assisted Circulatory Support report, infection, particularly involving the driveline exit site, is the most common.<sup>2</sup> While clinicians may be quick to dismiss erythema and pain at the driveline exit site as infection of the skin–driveline interface, it is important to consider other infectious etiologies. Here, we present a rare case of recurrent infections attributable to a retained driveline velour in a patient following successful orthotopic heart transplantation.

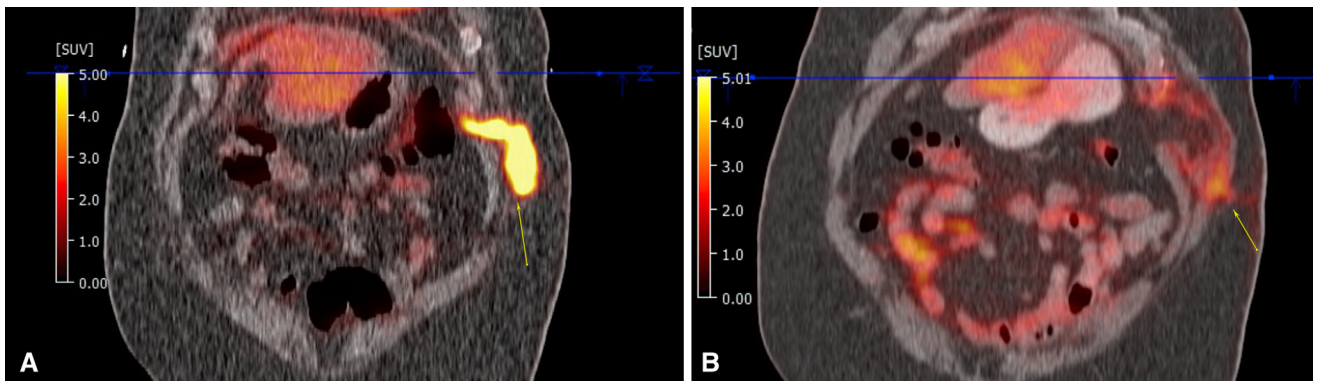
## CASE PRESENTATION

A 47-year-old man with a history of LVAD (HeartWare Ventricular Assist Device System; Medtronic) as a bridge to transplantation with successful orthotopic heart transplantation at an outside institution 3 years ago presented to our institution with complaints of left upper abdominal pain. Initial workup revealed fluid collection on ultrasound (US) and abdominal computed tomography (CT) extending from the skin through the left upper quadrant anterior abdominal wall to the left epicardial fat pad. He was admitted for empiric antibiotics. Subsequently, incision and drainage was performed, and the surgical area appeared healed with

no overlying tenderness or warmth. The patient remained without fever or leukocytosis. Wound cultures grew few *Coryneform* bacteria and rare coagulase-negative *Staphylococcus*-like colonies. He was continued on antibiotics until the fluid collection on CT resolved and was discharged with home nursing orders for wound-site management.

A month later, he represented with recurrent left upper abdominal pain but without fevers or chills. A positron emission tomography (PET)-CT showed multifocal changes with fluorodeoxyglucose (FDG) uptake within the abdominal wall tracking to the subdiaphragm. US-guided aspirate was unsuccessful due to thickness of the contents. Subsequent US-guided tissue biopsy of abdominal wall soft tissue revealed one colony of rare *Corynebacterium striatum*. Given these findings, he was started on empiric intravenous antibiotics and discharged with plans for long-term at-home administration and outpatient follow-up.

Two months later, he again presented with worsening left upper quadrant pain and swelling after completing the home antibiotic regimen 6 days previously. He was admitted and US-guided aspiration revealed rare gram-positive coccobacilli. He was restarted on antibiotics and underwent repeat



**FIGURE 1.** Coronal PET-CT showing FDG uptake in left upper quadrant anterior abdominal wall. A, Before excision of retained LVAD driveline velour. B, After excision of retained LVAD driveline velour.

PET-CT, which demonstrated worsening FDG uptake associated with subcutaneous fluid collection adjacent to soft tissue thickening of the left abdominal wall musculature (Figure 1, A). Due to this presentation, the decision was made to perform a more aggressive incision and drainage and exploration. A 2.5-inch retained LVAD driveline velour was found and excised from the surrounding tissue (Figure 2). He was discharged and placed on 6 weeks of antibiotics.

The patient exhibited good wound healing and PET-CT upon completion of antimicrobial therapy revealed diminished uptake (Figure 1, B). Plans were made to perform empiric imaging at 6 months' follow-up; however, in the interim, the patient unfortunately died of complications of coronavirus disease 2019 infection.

The institutional review board or equivalent ethics committee at University of California, Los Angeles, did not

approve this study, as it was deemed that a single-patient case report does not require institutional review board approval. Patient written consent for the publication of the study was not received, as the patient passed away.

## DISCUSSION

Infections, particularly those involving the driveline, represent the Achilles heel for LVAD therapy along with pump failure and thrombosis. Although improvements in the design of the latest LVADs have rendered the latter two issues less common, patients remain susceptible to infections as well as other complications, such as bleeding, right-sided heart failure, and stroke.<sup>3</sup> Improper driveline management continue to be a cause for patient morbidity, including inadvertent intraperitoneal driveline placement causing colonic perforation and the formation of intra-abdominal abscesses.<sup>4</sup> Our case of retained driveline velour as a cause of recurrent infections, years after successful heart transplantation, emphasizes the need for surgeons to take extraordinary precautions in not only LVAD implantation but explantation as well.

Standard procedures such as instrument counts designed to reduce the risk of retained foreign objects, obviously do not apply in cases such as this.<sup>5</sup> The velour is tunneled around the driveline to foster tissue ingrowth. Surgeons must take special measures to mitigate the possibility of retained foreign objects during LVAD explantation such as assessing the length of the driveline removed during explantation to account for its full original length as well as carefully inspecting it to ensure that there are no obvious missing portions of the covering velour. Careful dissection of the surrounding tissues to liberate the lead as opposed to mere traction is also very important. Using cautery slightly off the surface of the driveline circumferentially is important to avoid burning through it and increasing the risk of retention. We have summarized the aforementioned case report and its cautionary message in [Video 1](#).



**FIGURE 2.** Retained LVAD driveline velour.



**VIDEO 1.** Summary of the lessons learned from a patient with recurrent abdominal infections following a successful orthotopic heart transplantation. Video available at: [https://www.jtcvs.org/article/S2666-2507\(22\)00375-3/fulltext](https://www.jtcvs.org/article/S2666-2507(22)00375-3/fulltext).

While there is a temptation to attribute wound infections to superficial etiologies following LVAD explantation, our case demonstrates the need to consider the possibility of a

retained foreign object as part of the differential diagnosis when a patient with a history of device explantation presents with recurrent infections.

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