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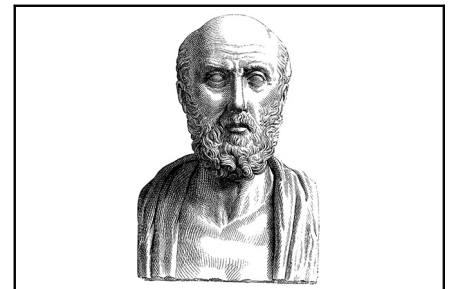


Commentary: Vita brevis, ars longa, iudicium difficile

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The full quote of Hippocrates (Greek physician circa 400 B.C.E.) translated from Latin to English is “Life is short, art long, opportunity fleeting, experience treacherous, judgment difficult.” The present case report exemplifies some of the challenging problems faced by patients with left ventricular assist devices (LVADs). The patient in this report¹ developed septicemia with *Pseudomonas aeruginosa* 3 years after his initial LVAD, LVAD exchange, and subsequent pump translocation (intra-abdominal) with omental wrapping (net 3 operations). He next developed recurrent septicemia and suffered 2 intracranial hemorrhages. A gallium single-photon emission computed tomography (GaPET-CT) scan showed a region of uptake in the outflow graft. Exchange of the involved section of graft confirmed a nidus of infection with vegetations within the graft. The patient recovered from segmental outflow graft replacement and underwent successful cardiac transplantation a year later. The survival of this patient is remarkable. It exemplifies treacherous experience and difficult judgments.

During the early years of LVAD development, experts identified infection, durability, and thrombosis/bleeding as obstacles to success.² Current rotary pumps provide greater durability than earlier pulsatile designs; however, infection (especially percutaneous driveline infection), bleeding, and thrombosis remain important sources of morbidity and



Hippocrates circa 400 B.C.E. (image in public domain).

CENTRAL MESSAGE

Infection is a challenging problem for patients with ventricular assist devices. This case required diagnostic acumen and careful surgical planning to achieve success in the setting of infection.

mortality.³ The patient in this report already had 3 major LVAD-related operations, including one that caused adhesions over the external pump housing (translocation of the LVAD to the abdomen with omentopexy). Intracranial hemorrhages further increased the risk of additional surgery. In the face of recurrent septicemia from *Pseudomonas*, the team chose GaPET-CT to image possible sources of infection. Alternative radionuclide options for identifying sites of LVAD infection include (18)F-fluorodeoxyglucose positron emission tomography/computed tomography scanning and leukocyte-labeled scintigraphy.⁴⁻⁶

The choice of radionuclide imaging modality depends on the options locally available. Moreover, the team must consider the requirements and limitations of each type of imaging. For instance, (18)F-fluorodeoxyglucose positron emission tomography/computed tomography scanning requires modification of the patient’s diet pre-scan to minimize myocardial uptake of 18F-fluorodeoxyglucose.⁴ Interpretation of radionuclide scans requires experienced radiologists, preferably in collaboration with the team caring for the patient. In this case, GaPET-CT imaging identified a region of uptake in the outflow graft close to the pump housing, indicating the presence of leukocytes, bacteria, and inflammatory proteins.

Replacing only a portion of the outflow graft did not sterilize the bloodstream. Moreover, there were probably small sites of *Pseudomonas* infection elsewhere in the device and in the patient’s body. The judgment to control the residual

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infection with antibiotics and proceed with transplantation was difficult; however, it was a good decision. There is limited information regarding optimal imaging of LVAD-specific infections or their management.⁷ This case¹ exemplifies the aphorism of Hippocrates “Life is short, art long, opportunity fleeting, experience treacherous, judgment difficult.” As we gain experience with mechanical circulatory support, encounters with various aspects of infection will undoubtedly increase. Device improvements (eg, elimination of percutaneous drivelines) and the generation of evidence-based guidelines for the diagnosis and management of infections will reduce the incidence and consequences of infections in future patients with LVADs.

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