

A report on interventional acute bare-metal stenting of the HeartMate 3 left ventricular assist device twisted outflow graft

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A long-term mechanical circulatory support program is feasible in the Polish healthcare system. The HeartMate 3 pump (Abbott, Abbott Park, Illinois, United States) is a modern fully magnetically levitated centrifugal-flow left ventricular assist device (LVAD) system with reported improved hemocompatibility and a reduced stroke rate.¹ In this particular LVAD, cases of an outflow graft twist have been reported with a low overall incidence rate of 0.72%.² This complication may lead to an abrupt pump dysfunction with a potentially fatal course.

We present a case of a 54-year-old man with ischemic cardiomyopathy who underwent a HeartMate 3 implantation via median sternotomy. Four months after the surgery, the patient was admitted to the hospital due to transient symptoms of aggravated heart failure. Echocardiography showed no relevant pathology. The levels of lactate dehydrogenase were low. At this time, also no pump malfunction was detected and after conservative treatment, the patient was discharged home in good functional status.

Ten months after the surgery, a driveline infection was diagnosed. During hospital treatment of methicillin-resistant *Staphylococcus aureus* infection, significant blood hemolysis was diagnosed as well. After abrupt onset of pump flow decrease, acute angiography was performed to visualize the graft as previously described.³ Twisting of the LVAD outflow graft was detected and successfully treated with an insertion of a 10/30 mm Assurant Cobalt 1030L (Medtronic, Minneapolis, Minnesota, United States) bare-metal stent (FIGURE 1A).

The recovery was uneventful. The LVAD function was stable up to heart transplantation 2 weeks later due to recurrent driveline infection (FIGURE 1B).

An early diagnosis of outflow graft twisting proved to be challenging as our patient showed initially no pump alarms, low lactate dehydrogenase values, and no relevant echocardiography findings. Additionally, the clinical symptoms were initially short-lived.

Basically, there are 2 options for the treatment of the outflow graft twisting to be considered: open surgical correction or insertion of stent or stentgraft into the affected segment. Potapov et al⁴ described a similar case and performed a surgery via anterior thoracotomy. The outflow graft was protected by wrapping with polytetrafluoroethylene reinforced ring. The group from Vienna⁵ described a series of 3 cases with successful stent placement in a case of LVAD outflow graft stenosis. Pump exchange or systemic thrombolytic therapy are associated with significant mortality and morbidity in patients with this pathology. Implantation of bare-metal stents within the stenosed outflow graft was seen as an attractive alternative treatment.⁵ We decided to implant the stent despite active infection because we considered it the least invasive procedure. Operation would be a much more extensive procedure. This approach seems to be efficient and safe to perform in an acute setting. Avoiding surgical exploration is beneficial in terms of continuous anticoagulation management. There is no need to withdraw a vitamin K antagonist and acetylsalicylic acid.

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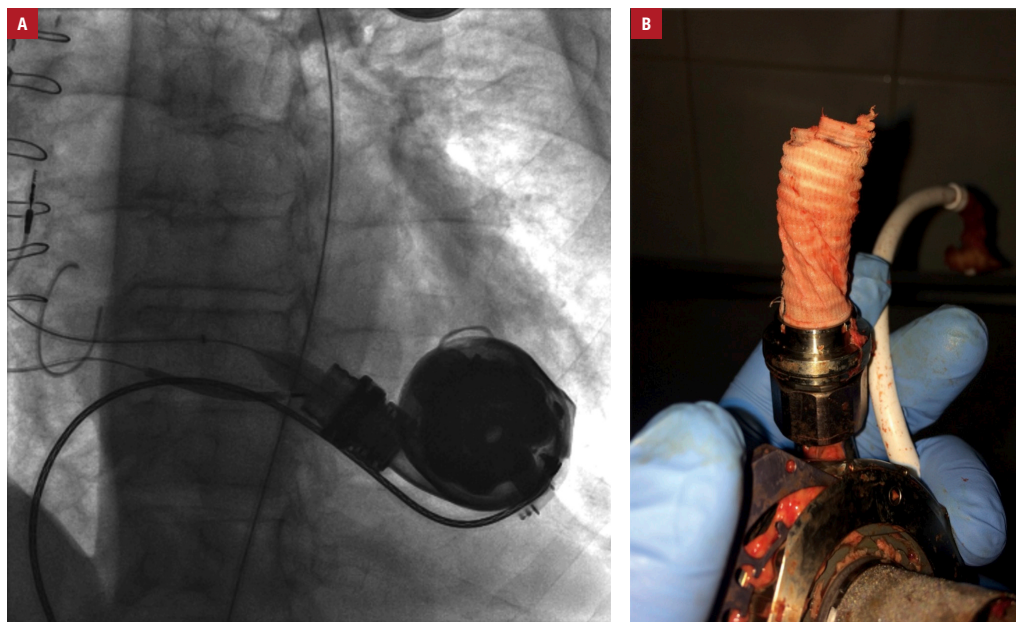


FIGURE 1 **A** – insertion of the Assurant Cobalt bare-metal stent during acute angiography; **B** – the intraoperative view of the outflow graft during the heart transplantation. The depicted proximal part of the outflow graft shows the characteristic twisting.

Early diagnosis of outflow stenosis can be challenging. We suggest that insertion of a bare-metal stent in the case of LVAD outflow graft twisting is an attractive and less invasive treatment option when compared with surgical therapy.

ARTICLE INFORMATION

CONFLICT OF INTEREST None declared.

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