Durable Medical Therapy for Heartware LVAD Thrombosis

J. W. Wald[1], C. Justice[2], D., J. Marble[2], E. Laverty-Wilson[2], E. Birati[1], C. Bermudez[2], P. Atluri[2], M. Acker[2], E. Guarracino[2,] E. Rame[1]

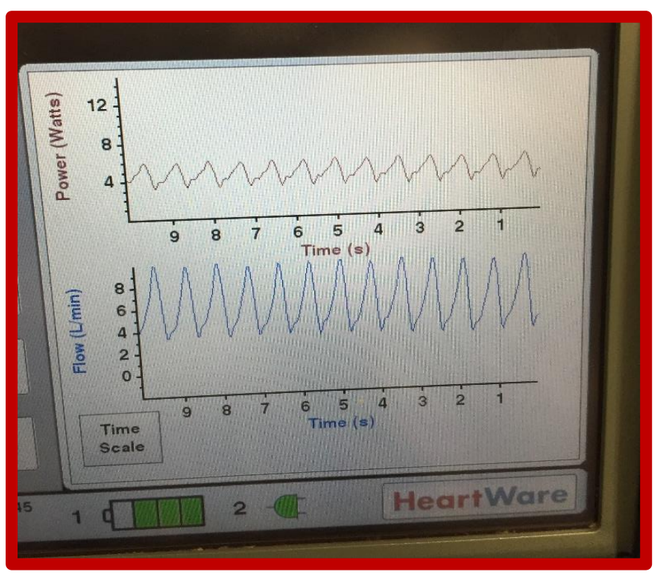
[1]University of Pennsylvania Hospital, Philadelphia, PA, [2]Cardiothoracic Surgery, University of Pennsylvania Hospital, Philadelphia, PA

ABSTRACT

Ventricular assist device (VAD) thrombosis in the era of continuous flow (CF) VADs has remained a significant complication that leads to morbidity and mortality[1]. Although treatment of VAD thrombosis in the heartmate II (HM II) device has favored early pump exchange[2], Heartware VAD (HVAD) thrombosis maybe treated with thrombolytic (lytic) therapy especially if the power consumption does not rise precipitously.[3] The durability of medical therapy with systemic thrombolysis for VAD thrombosis has not yet been described in the literature.

OBJECTIVE

To describe the durable outcome of patients with Heartware LVAD thrombosis who were treated with thrombolytic therapy.



METHODS

We identified all patients with Heartware VAD thrombosis in a large academic center between April 2009 and October 2017. Data was obtained by retrospective chart review of medical records. Protocol for lytics included: baseline head CT scan. Traditional contraindications based on acute MI literature was applied to the patients. If PT/INR was supra-therapeutic vitamin K was given, if INR was low, heparin was initiated. One patient had HIT, so bivalirudin was initiated after thrombolysis. The patients received a 10 mg bolus of TPA over 1 minute, then 20 mg infusion over 20 minutes for a total of 30 mg. This could be repeated two more times (no more than 100 mg in 24 hours). Additional oral anti-platelet was then added after thrombolysis was complete.

RESULTS

A total of 7 patients with HVAD thrombosis were identified from a total of 81 patients implanted (7%). Six patients received thrombolysis and one patient who was not felt to be a candidate for lytic therapy and underwent pump exchange. One of the six patients with ingested clot in the inflow who was not a candidate for pump exchange received thrombolysis as salvage therapy and did not respond with subsequent mortality. One patient had a temporary response but ultimately required pump exchange followed by a subsequent pump exchange to heart transplantation. One patient did not respond after one round of thrombolytics and due to hypertension was successfully taken through pump exchange. The remaining three patients who had an acute syndrome of pump thrombosis with variable time profiles of power consumption responded to thrombolysis and continued to be free of recurrent VAD thrombosis at 4 (transplanted), 7 (ongoing) and 20 (deceased) months of follow up.

CONCLUSIONS

In a subset of patients with clinical HVAD thrombosis consisting of severe hemolysis and increasing abnormal power consumption thrombolysis provided a sustained therapeutic effect without recurrence Future studies should attempt to identify patient profiles that predict a sustained response to medical therapy for HVAD thrombosis.

REFERENCES

1. Maltais S. J HLTx 2017;30(1):1
2. Starling R. NEJM.org; November 27,2013
3. Jorde, U., et al. JACC HF 2015