Tissue Plasminogen Activator Administration via Purge Solution in Suspected Impella® Thrombosis

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Disclosure: The authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or in direct interest in the subject matter of this presentation:
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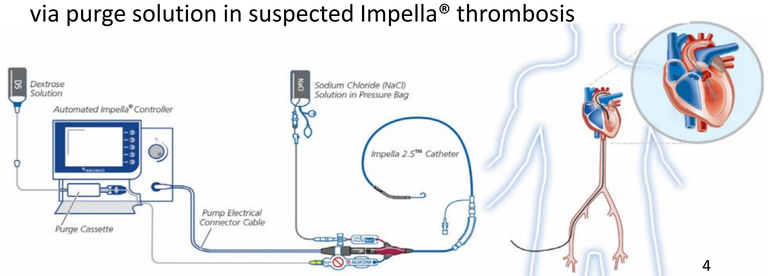
Background

- Impella® percutaneous assist devices are temporary microaxial flow devices that provide ventricular support in cardiogenic shock[1,2]
- Device complications including hemolysis and pump thrombosis, which may result in pump failure and/or require device exchange[3,4]
- Anticoagulant-containing purge solutions are used to create a pressure barrier within the pump motor to prevent pump thrombosis[2,4]
- Management of acute pump thrombosis is not well defined, but tissue plasminogen activator (tPA) administration via purge solution has been described in a small number of cases[5,6]

Purpose

- Describe a single institution's use and outcomes of tPA administration via purge solution in suspected Impella® thrombosis

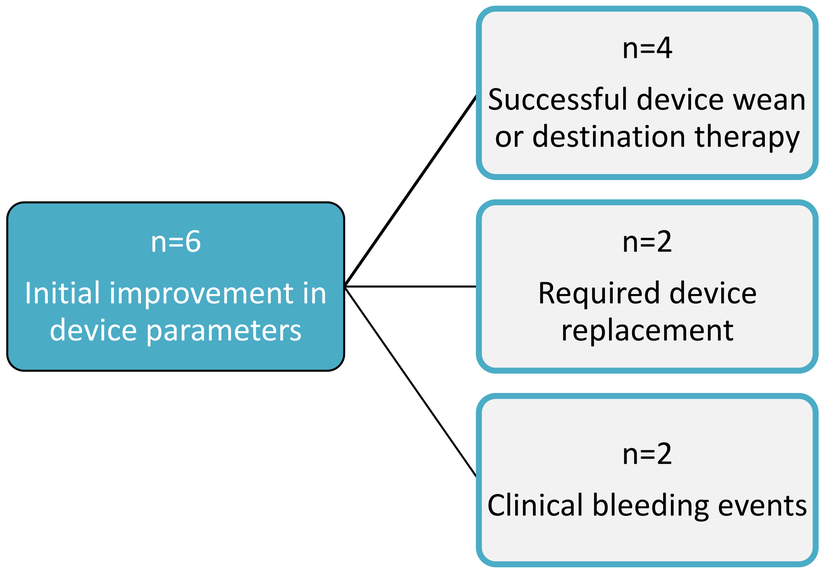


Methods

- Single-center case series
- Retrospective chart review from December 2017—June 2020
- Included all patients who received tPA purge solution for suspected Impella® thrombosis
- Data collection included device type, number of doses administered, tPA purge solution concentration, pre- and post-tPA flow rate, purge infusion rate, and purge pressure, and clinical outcome

Results

Patient (n=6)	Device Type	Rationale for tPA	# tPA Doses	tPA Purge Conc.	1st tPA Dose/Total Device Days	Improvement in Device Parameters	Outcome
67 YOM with RV failure post LVAD placement	Impella RP®	↓ flow rate ↑ purge pressure	1	0.02 mg/mL	Day 5 of 22	Yes	Device remained for 17 days until successful weaning Hematochezia
21 YOM with RV failure post LVAD placement	Impella RP®	↓ purge infusion rate ↑ purge pressure	2	0.04 mg/mL	Day 2 of 7	Yes	Device remained for 4 days after last dose until successful weaning
35 YOM with RV failure post LVAD placement	Impella RP®	↓ purge infusion rate ↑ purge pressure	1	0.04 mg/mL	Day 1 of 3	Yes	Device remained for 2 days until removal due to hemolysis, no further mechanical support required
75 YOM with RV failure post LVAD placement	Impella RP®	↓ purge infusion rate	2	0.02 mg/mL	Day 2 of 6	Yes	Device remained for 2 days after last dose until successful weaning
70 YOM with cardiogenic shock 2/2 STEMI	Impella CP®	↓ flow rate ↓purge infusion rate ↑ purge pressure	3	0.02-0.04 mg/mL	Day 16 of 16	Yes	Device replaced, then second device replaced same day with IABP
52 YOM with cardiogenic shock 2/2 myocarditis	Impella 5.0®	↓ purge infusion rate ↑ purge pressure	8	0.04-0.08 mg/mL	Day 7 of 14	Yes	Device replaced/upgraded with no further issues Diffuse alveolar hemorrhage



Limitations

- Small sample size
- Variation in anticoagulant-containing purge solution utilized
- Uncertainty in whether patients were systemically anticoagulated throughout course of their device
- Variation in tPA purge solution concentration and duration of infusion

Conclusions

- tPA administration via purge solution is a reasonable salvage therapy for suspected Impella® thrombosis to prevent device exchange
- Bleeding may occur with tPA administration, but risk appears low
- The findings of this case series add to the small amount of available literature supporting tPA therapy for suspected Impella® thrombosis

References

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