



Tricuspid percutaneous vegetectomy: a possible alternative to surgery in injection drug use-associated infective endocarditis.

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Introduction

- Injection drug use (IDU) is the most common cause of right-sided native valve infective endocarditis (IE), with 90% of these cases involving the tricuspid valve^{1,2}.
- Post-operative risk of mortality or reoperation for right-sided native valve endocarditis is 10 times greater in people who inject drugs (PWID) compared to those without a history of IV drug use³.
- The AngioVac System (Fig. 1 a,b) is a percutaneous-vacuum device that has recently been used for removal and debulking of tricuspid valve vegetations that may be a less invasive treatment in cases where surgery is contraindicated^{4,5-7}.
- This study aims to compare pre-operative factors and outcome measures in patients with tricuspid valve IDU-IE who underwent tricuspid valve vegetectomy and those who underwent tricuspid valve surgery.

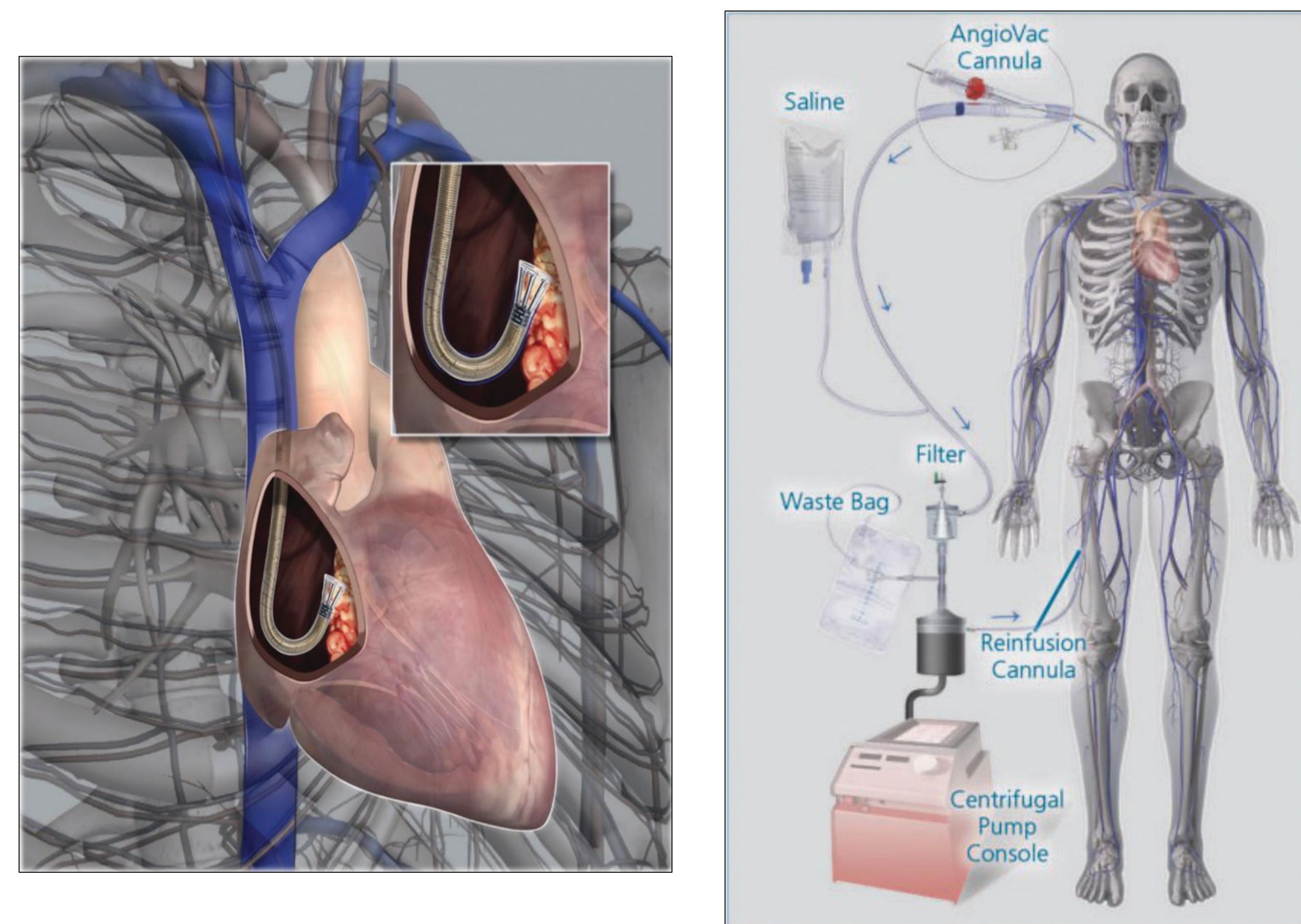


Figure 1 a (left) and b (right). (a) AngioVac Device used for debulking vegetations with a self-expanding funnel⁸. (b) AngioVac circuit with a cannula and extra-corporeal circuit with a filter removing intravascular debris⁸.

Materials and Methods

- A retrospective chart review was conducted of 39 patients hospitalized at UPMC-Presbyterian for IDU-IE who underwent either a percutaneous tricuspid valve vegetectomy (n=5) or an open tricuspid valve repair or replacement (n=34) from Jan 2019 to Dec 2022.
- Pre-operative factors and post-surgical outcomes were compared amongst groups
- Data analysis was performed using chi-squared test with IBM SPSS Statistics.

Results

Table 1. Pre-operative factors (age, sex, race, ethnicity, Charlson Comorbidity Index) compared amongst patients who underwent vegetectomy versus valve surgery.

Total Population (39)	AngioVac (n=5)	Surgery (n=34)	Chi squared (p value)
Age Mean = 32.5 Range = 19-58	32.6 19-43	32.4 22-58	22.597 (0.425)
Sex Male - 10 Female - 29	0 5	10 24	1.978 (0.160)
Race American Indian - 1 Black - 5 White - 32 Declined - 1	0 1 4 0	1 4 28 1	0.528 (0.913)
Ethnicity Not Hispanic/Latinx - 37 Hispanic/Latinx - 1 Other - 1	5 0 0	32 1 1	0.310 (0.856)
CCI Score 0 - 10 Score 1 - 29	0 5	10 25	1.978 (0.160)

- Mean age for the surgery group was 32.4 versus 32.6 in the vegetectomy group. The vegetectomy group included only females compared to 70.5% females and 29.4% males in the surgery group. The vegetectomy group had more co-morbidities compared to the surgery group using the Charlson score (Table 1).

Table 2. Post-operative measures (bacteremia recurrence within 180 days, readmission for bacteremia within 180 days, and mortality within 180 days) compared amongst patients who underwent vegetectomy versus valve surgery.

Total Population (39)	AngioVac (n=5)	Surgery (n=34)	Chi squared (p value)
Bacteremia recurrence within 180 days (% within procedure) No - 27 Yes - 12	2 (40.0%) 3 (60.0%)	25 (73.5%) 9 (26.5%)	2.300 (0.129)
Readmission within 180 days (% within procedure) No - 27 Yes - 12	2 (40.0%) 3 (60.0%)	25 (73.5%) 9 (26.5%)	2.300 (0.129)
Mortality within 180 days (% within procedure) No - 35 Yes - 4	4 (80.0%) 1 (20.0%)	31 (91.2%) 3 (8.8%)	0.592 (0.442)

- There were 9 patients (n=34, 26.5%) in the surgery group and 3 patients (n=5, 60%) in the vegetectomy group who were readmitted with bacteremia within 180 days of the procedure (p=0.129) (Table 2)
- There were three surgery patients (8.8%) who died within 180 days of surgery compared to one vegetectomy patient (20%) (p=0.442) (Table 2)
- In the vegetectomy group, 2 out of the 3 vegetectomy patients (66.7%) who were readmitted for bacteremia were infected with the original pathogen versus 1 out of 9 surgery patients (11.1%) (Table 3)

Results

Table 3. Comparison of original pathogen, procedure, treatment duration and completion, post-procedural bacteremia, and presumed source amongst patient readmitted within 180 days for bacteremia.

Original pathogen	Procedure	Duration of IV abx	Completed IV treatment?	Post-procedural bacteremia	Presumed source/etiology of bacteremia
MRSA, <i>Candida dubliniensis</i>	AngioVac	6 weeks	Yes	<i>E. faecalis</i>	Gut translocation d/t constipation
MRSA	AngioVac	6 weeks	Yes	MRSA	Inadequate source control of prior infection
<i>Enterobacter</i> , <i>S. marcescens</i>	AngioVac	10 days	No	<i>S. marcescens</i>	Incomplete treatment
MSSA	Surgery	8 weeks	Yes	<i>E. faecalis</i>	IVDU
MRSA	Surgery	3.5 weeks	No	<i>E. faecalis</i>	IVDU
MRSA	Surgery	5.5 weeks	No	<i>E. faecalis</i>	IVDU
MSSA	Surgery	6 weeks	Yes	<i>E. faecalis</i>	2 ^o to gastroenteritis
MSSA	Surgery	6 weeks	Yes	<i>S. marcescens</i>	IVDU vs dental source
MSSA	Surgery	6 weeks	Yes	MRSA	IVDU
MRSA	Surgery	6 weeks	Yes	<i>H. parainfluenzae</i>	IVDU vs dental source
MRSA	Surgery	2 weeks	No	MRSA	IVDU
MSSA	Surgery	6 weeks	Yes	<i>S. marcescens</i>	IVDU

- Of the 9 patients infected with a different pathogen, 5 patients were infected with *E. faecalis* and 2 were infected with *S. marcescens* (Table 3).

Conclusions

- Due to the small sample size, no statistically significant conclusions can be drawn.
- Patients in the vegetectomy group had higher rates of readmission within 180 days of the procedure, with some patients eventually undergoing tricuspid valve surgery due to incomplete treatment with a vegetectomy.
- Recurrent IVDU was the most common presumed etiology of post-procedural bacteremia (Table 3).
- More data is needed to assess the longitudinal effectiveness of the AngioVac procedure for PWID.

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