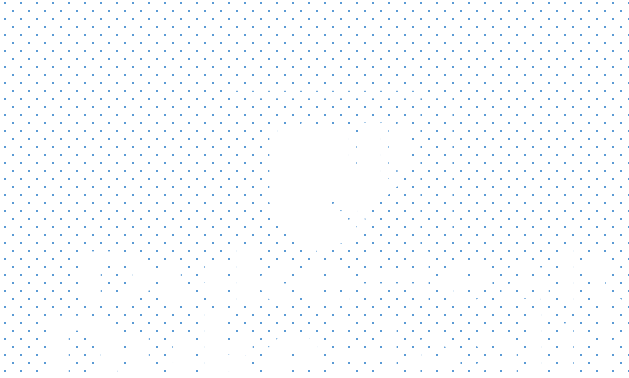




“KILLER BLOOD CLOTS: VACUUM THEM OUT!”

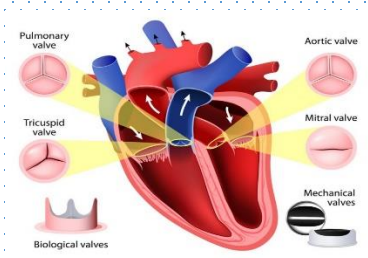
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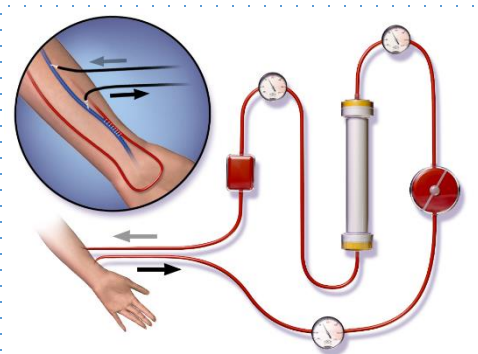
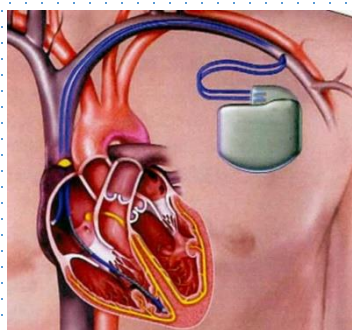
SIGNIFICANCE AND BACKGROUND

Endocarditis is a life-threatening inflammation of the inner lining of the heart’s chambers and valves. It is usually caused by an infection. Typically bacteria, fungi or other germs enter the bloodstream and attach to damaged areas of the heart. Without quick treatment, endocarditis can damage or destroy the heart valves. For patients with infective endocarditis or infected cardiac leads, antibiotics are currently the standard of care with surgical embolectomy. In 2014 the FDA approved a percutaneous minimally invasive system to remove intravascular thrombi. This device can remove vegetation from cardiac implantable electrical devices and endocarditis involving Tricuspid valve vegetation.



ASSESSMENT

Tricuspid valve infective endocarditis (TVIE) is considered rare when compared to left-sided infective endocarditis. Right sided infective endocarditis (RSIE) accounts for approximately 5% – 10% of all cases of infective endocarditis (IE). The overwhelming number of cases of RSIE involve the tricuspid valve with some estimates as high as 90%. The majority of TVIE are associated with IV drug use (IVDU). With our society plagued by the increase of IVDU, rates of TVIE have also increased significantly since 2006. Along with IVDU, hemodialysis catheters, pacemakers, and defibrillator leads are also risk factors. Staphylococcus aureus is the most common organism to cause TVIE. With early detection and interventions, TVIE is treatable and may have favorable outcomes.



PREPARATION AND PLANNING

Mobilization of intravascular clots, thrombotic or tumoral masses, and vegetative material is associated with an increased risk of pulmonary emboli (PE). The percutaneous aspiration catheter device system provides an alternative endovascular approach to removing intravascular, intracardiac and vegetative material including tumors and septic vegetations from the right heart. The large luminal diameter of the percutaneous aspiration device enables the rapid removal of large volumes of material, potentially reducing fragmentation of clots during aspiration and the risk of embolization.

TYPICAL PATIENT PRESENTATION

Usually Tricuspid Valve Endocarditis from IV Drug Use (IVDU)

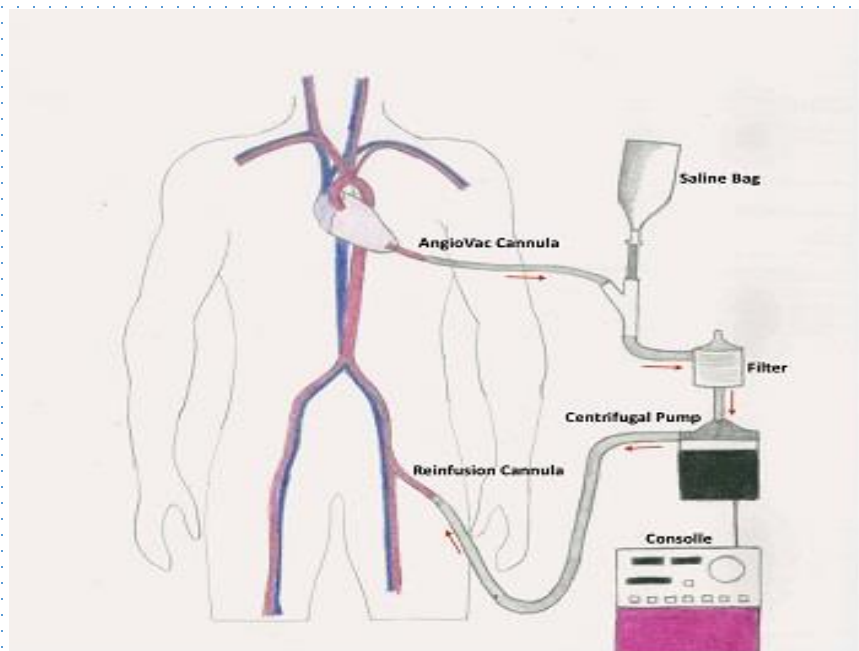
Fever, chills despite intravenous antibiotic therapy

Moderate to Severe Tricuspid Regurgitation on Transthoracic Echocardiogram (TTE)

Evidence of Septic Emboli on Chest Computed Tomography

Medical support and counseling yet patient states desire to continue IV Drug use

Deemed high surgical risk therefore percutaneous debulking of vegetation procedure viewed as best surgical intervention



IMPLEMENTATION

STEPS & MATERIALS FOR CLOT VEGETATION DEBULKING:

- ❖ 22 French Aspiration Cannula
- ❖ Veno-venous Bypass Circuit and a Reperfusion Cannula
- ❖ Place two patient venous access vein sites (femoral or jugular) (1) for aspiration and (1) for reperfusion
- ❖ Extracorporeal bypass circuit consist of an outflow line, centrifugal pump, filter and an inflow line
- ❖ Activate the centrifugal pump to create a one-way flow to provide suction to the cannula tip
- ❖ The device has a balloon-activated tip to augment venous flow and facilitate removal of the thrombus material into the filter
- ❖ The circuit reinfuses the filtered blood back into the body through the reperfusion cannula to minimize blood loss
- ❖ Post procedure TEE performed to verify reduction and removal of clot

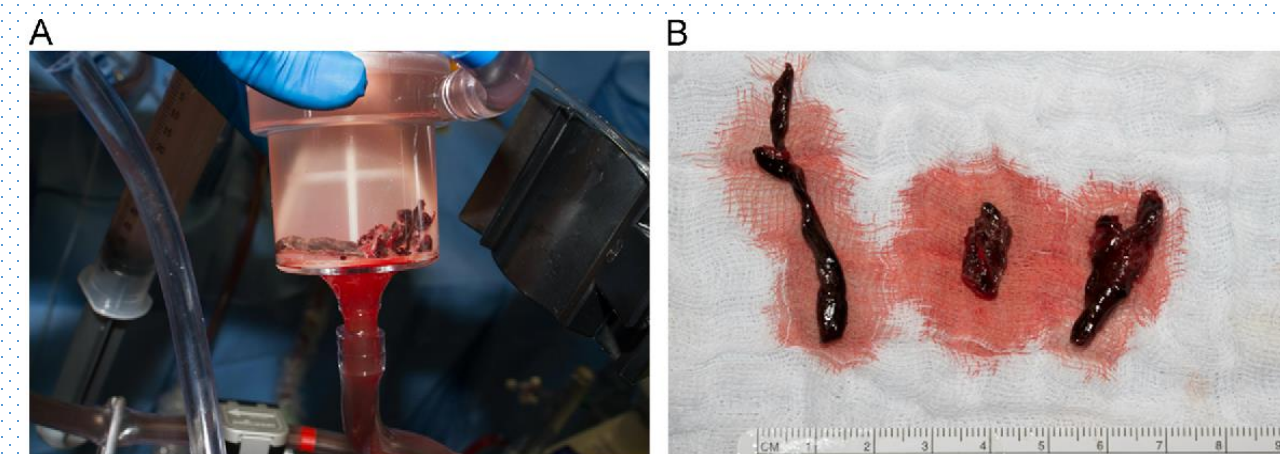
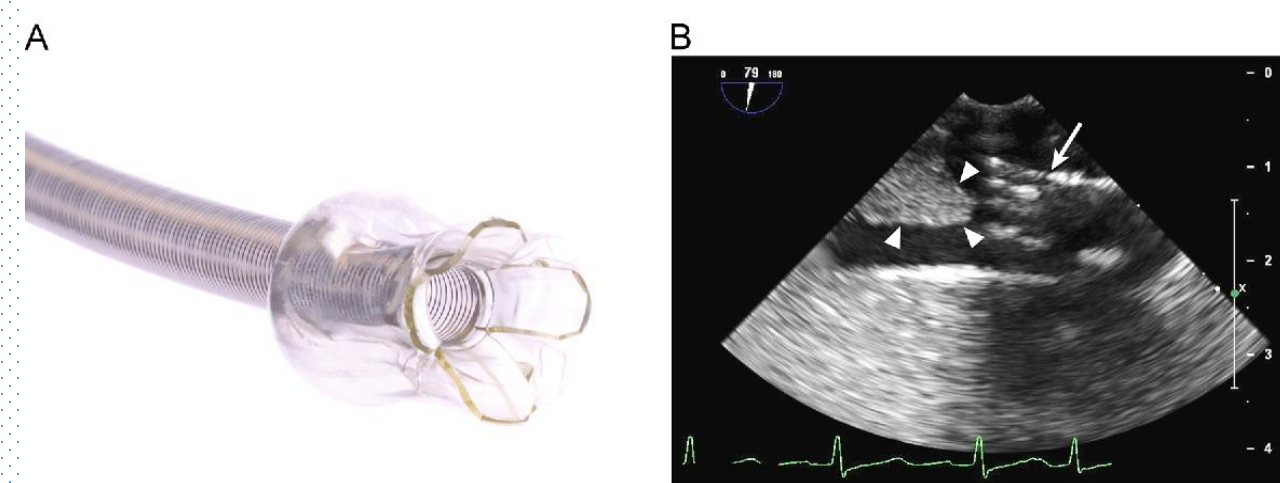


Fig 4. Gross views of thrombus. (A) Thrombus has been captured in the filter. (B) Thrombus has been removed.

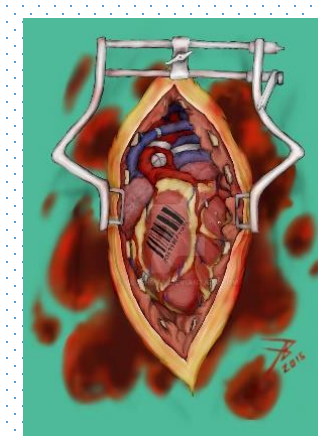


OUTCOMES: TOTAL PATIENTS TREATED N = 20

Size of Vegetation - Average	Size of vegetation	Echo Preop Tricuspid Regurgitation (TR)	Echo Postop Tricuspid Regurgitation Change	Bacterial Source	Post op Follow Up Compliance
Preop smallest = 1.2cm	Postop none = (14)	None (2)	No change (14)	IV Drug User (16)	Yes (2)
	Too Small to measure (4)	Trace TR (1)	None to mild (1)	Teeth Decay (1)	None (9)
Preop largest = 6cm x 3.9cm	0.5 cm (1)	Mild TR (3)	Trace to Mild (1)	Foot Osteomyelitis(1)	No Show for 6 month appt (2)
	5.4 x 3.1 cm (1)	Mod TR (7)	Mild to Mod (1)	Prosthetic Knee Infection (1)	Pending 6 month appt (3)
		Severe TR (7)	Mild to Severe (2)	ESRD at Dialysis Groin Line (1)	Still Hospitalized (2)
			Mod to Severe (1)		Deceased (2)

CONCLUSION AND FUTURE IMPLICATIONS

Individuals who participate in IV drug use place themselves in increased risk for Infective Endocarditis and injury to their Tricuspid Valve. Surgeons are quite reluctant to operate on these patients given their high rate of reinfection and need for reoperation. The use of the percutaneous aspiration device with vegetation debulking has been a “game changer” for this patient population. It does not require open heart surgery or the implantation of a prosthetic valve. This allows for the reduction of bacterial load and boosts antibiotic efficacy with resolution of sepsis. These factors all aid to reduce the patient’s morbidity and mortality rates.



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