Percutaneous Closure of Aortic Paravalvular Leak

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Disclosure Statement of Financial Interest

I, Raúl Solernó, DO NOT have a financial interest/arrangement or affiliation with one or more organizations that could be perceived as a real or apparent conflict of interest in the context of the subject of this presentation.
Medical History Summary

• 50 years old, Male.
• Smoker
• No history of cardiovascular disease.
• Referred to our institution for infective endocarditis of native aortic valve (enterococcus faecalis). Clinical signs of Congestive Heart Failure on admission.
Medical history summary

• ECHO (TTE-TEE): Tricuspid aortic valve. Right coronary and non coronary valve vegetation (14 and 5 mm respectively). Non coronary valve perforation and severe aortic insufficiency. No annulus abscess. Normal left and right ventricular function.

• Antibiotic treatment. Negative blood cultures. Silent renal emboli found on CT scan.

• Surgery indicated.
Medical history summary

- Aortic valve replacement with a 23 size mechanical prosthesis.
- Favorable recovery during postoperative period.
- Heart Team evaluation: considering no instability or disfunction of the valve prosthesis, a transcatheter approach was chosen.
Procedural Technique

- Conscious Sedation
- TEE guidance
- Retrograde approach: Bilateral Femoral Access
- 10,000 UI Heparin
- Marker Pig-Tail Catheter for Angio Control
TEE: Modified Transgastric View
• JR4 Catheter over an angled-tip 0.035” wire was passed through the defect into the right ventricle

• Exchange to an Amplatz GuideWire (0.035” x 300 cm)

• 8 mm Peripheral Balloon inflated at very low pressure to size the defect

• TEE and Angio showed complete flow cessation
• 5 french Delivery system was passed through the defect

• Amplatzer Duct Occluder device ADO II 6/4 advanced.
• Distal disc of the device positioned over the ventricular side of the fistula and proximal disc over the aortic side

• Fluoroscopy and TEE showed that the aortic leaflet motion was unimpeded
Deployment of Amplatzer ADO II 6/4

Angio indicating RCA patency
Device unscrewed and released
TEE: Modified Transgastric View
Final Angiogram showed minimal flow through the device demonstrating excellent immediate result.
Summary

• Aorto-RV fistula after prosthetic aortic valve replacement is an exceedingly rare condition.

• Although they do not provoke valvular insufficiency, they have been described as “Unusual Paravalvular Leaks”.

• Published cases are scarce
Percutaneous Closure of an Aorta to Left Atrium Fistula with an Amplatzer Duct Occluder

Ted Feldman, MD, FACC, FSCAI, Michael H. Salinger, MD, FACC, FSCAI, Sundeep Das, MBBS, FACC, and Andrew J. Hamilton, MD, PhD

We describe percutaneous closure of an unusual paravalvular leak, with a communication from the noncoronary cusp of the aortic valve to the left atrium adjacent to a St. Jude mitral valve prosthesis, in the absence of an infection. The patient presented with worsening dyspnea and edema. The anatomic location of the valve annulus adjacent to the noncoronary cusp underlies the etiology of this communication. Outcomes from surgical repair are associated with high mortality. We performed percutaneous closure of the defect, using general anesthesia and transesophageal echo guidance. An Amplatzer duct occluder was placed in the fistula, with immediate and complete closure of the shunt. While no devices specific for closure of paravalvular leaks have been designed, growing experience with a variety of devices and the use of echo guidance have allowed successful therapy in many complex cases. © 2005 Wiley-Liss, Inc.
Diagnosis and Management of Traumatic Aorto–Right Ventricular Fistulas

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Background. Traumatic aorto–right ventricular (Ao-RV) fistulas are rare lesions that result in congestive heart failure if left untreated. Early diagnosis and prompt surgical intervention are required to avoid the natural outcome of cardiac decompensation.

Methods. All cases of traumatic Ao-RV fistula described in the English literature since 1958 were reviewed. The clinical presentation, methods of diagnosis, and treatment strategies were assessed to determine the pathophysiology, natural history, and outcome of surgical intervention.

Results. Forty cases of traumatic Ao-RV fistulas were described in the English literature. There were 39 men and 1 woman, with a mean age of 28.3 years (range, 15 to 50 years). Twenty-two (55%) patients had isolated Ao-RV fistulas. Fourteen (35%) had Ao-RV fistulas with aortic insufficiency. Definitive surgical repair was performed in 38 patients. The associated aortic valve injuries were managed with repair techniques or replacement with prosthetic devices. The surgical outcomes in all patients were satisfactory.

Conclusions. The pathophysiology and natural history of Ao-RV fistulas involves the development of congestive heart failure. Traumatic aortic insufficiency frequently is associated with this disorder. Early diagnosis and prompt treatment are necessary to avoid the natural outcome of cardiac decompensation. Definitive repair should be performed with the aid of cardiopulmonary bypass during the same hospitalization.

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Summary

• Several mechanisms of injury have been proposed:
  • Inadvertent injury to the membranous septum.
  • Perivalvular damage due to improper tissue retraction.
  • Pseudo-aneurysm formation and rupture into the RV.
  • Inclusion of the membranous portion of the ventricular septum in the prosthetic valve suture line.

• Percutaneous correction of this defects, although challenging, is feasible, providing multimodality imaging is used for case planning, device election, and procedural guidance.
Thank you