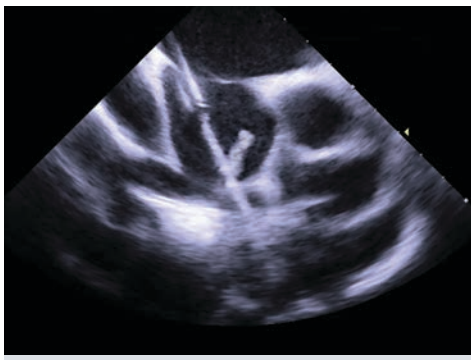
# Cath Lab Digest

A product, news & clinical update for the cardiac catheterization laboratory specialist

CASE REPORT

## A Flame That Can Ignite Disaster: A Rare Hyperacute Thrombus Formation During Percutaneous Closure of an Atrial Septal Defect


*Juan Guzmán-Olea, MD; Juan Francisco Rodríguez-Alvarado, MD; Raúl Cruz-Palomera, MD; Gonzalo Tolosa-Dzul, MD; Gabriel Guzmán-Olea, MD; Jorge Guillermo Arenas-Fonseca, MD; Daniel Iván Pérez Vásquez, MD; Héctor Hugo Escutia Cuevas, MD; Carlos Javier González Álvarez, MD*


The percutaneous closure of atrial septal defects (ASD) has become a feasible and safe alternative to conventional surgical closure. Percutaneous ASD closure has established its procedural safety through operator experience and improved device structure and deliverability. The evolution of ASD closure device usage in the last 4 decades incorporates developments minimizing a wide range of serious side effects that have been reported over the years.

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In This Issue



LOWER-EXTREMITY INTERVENTION

## The Arnsberg Registry: Thrombus Removal With the Aspirex Mechanical Aspiration Thrombectomy System

*CLD talks with Michael K. W. Lichtenberg, MD.*

**Can you tell us about the Arnsberg Registry?**

The intention of the Arnsberg Registry is to analyze the efficacy and safety of a mechanical thrombectomy device, the Aspirex Mechanical Aspiration Thrombectomy System (BD), in daily routine practice in patients with acute and subacute iliofemoral deep vein thrombosis (DVT) via a retrospective analysis. The Arnsberg registry is an overall construct of many registries, prospective and retrospective.

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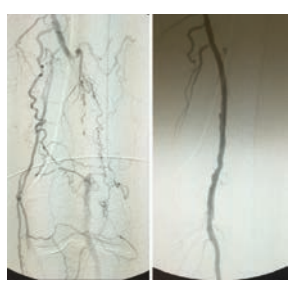
PVD AWARENESS

## Improving Early Diagnosis and Treatment of Peripheral Vascular Disease: Enhancing Patient Outcomes and Quality of Life

*Joyce Froetschel*

Approximately 200 million people worldwide suffer from peripheral vascular disease (PVD), and yet it is one of the most underdiagnosed and undertreated conditions in healthcare today. Although coronary and cerebral vascular disease are concomitant conditions with PVD, the PVD population's morbidity and mortality rates are greater, with a 60% excess risk of all-cause mortality and a 96% increase in cardiovascular deaths where the ankle brachial index (ABI) is <0.9.[1]



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# A Flame That Can Ignite Disaster: A Rare Hyperacute Thrombus Formation During Percutaneous Closure of an Atrial Septal Defect

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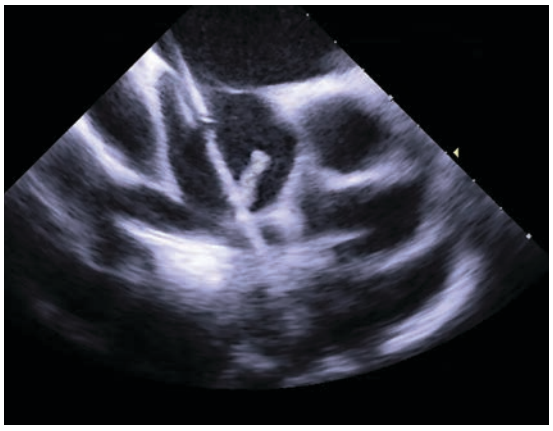

**Figure 1. An echolucent and oscillating image, like a flame, was observed in the Amplatz Super Stiff guidewire that was suggestive of thrombus.**

Complications reported in the literature include air embolization, device embolization, erosions, residual shunts, nickel hypersensitivity, and early and late thrombus formation; this last, although uncommon, can result in serious sequelae, such as systemic embolism. Herein, we report the case of a female patient who underwent transcatheter closure of an atrial septal defect with the use of an Amplatzer Septal Occluder (Abbott Vascular) under intracardiac echocardiography guidance where acute thrombus formation periprocedure was noted, despite preprocedural anticoagulation with unfractionated heparin. Reports of thromboembolic events related to devices are rare.

## Case Study

A 28-year-old woman was admitted to our hospital with a 6-month history of exertional dyspnea. Physical examination revealed a soft systolic murmur at the upper left sternal border with wide and fixed split S2. An electrocardiogram showed sinus rhythm with incomplete right bundle branch block. Transthoracic echocardiography (TTE) revealed a secundum-type atrial septal defect with a defect diameter of 25 mm, dilated right cavities, Qp/Qs ratio 2.2, a pulmonary artery systolic pressure of 45 mmHg, and mild tricuspid regurgitation.

The patient was taken to the catheterization laboratory where a 6 French (F) introducer sheath was placed in the right common femoral vein and a multipurpose catheter was advanced to the right upper pulmonary vein. Angiography confirmed the passage of contrast medium into the right atrium through an atrial septal defect. Pulmonary artery pressure was 43/13/25 mmHg. We performed intracardiac ultrasound, placing a 10 French (F) introducer sheath in the left common femoral vein. Before advancing the ultrasound probe to the right atrium, we gave the patient 100 IU/kg of unfractionated heparin and she was placed under conscious sedation. The intracardiac ultrasound confirmed a large atrial septal defect of 34 mm and left to right shunt. We decided on intervention with a 36 mm Amplatzer Septal Occluder. An Amplatz Super Stiff guidewire (Boston Scientific) was advanced to the left superior pulmonary vein and the 6F introducer sheath was changed to a 12F Mullins introducer sheath (Medtronic). An attempt to deploy the device was made without success, with displacement of the sheath to the right atrium. We again advanced the Amplatz Super Stiff guidewire to the left superior pulmonary vein and Mullins introducer sheath; however, on the intracardiac ultrasound we observed an echolucent and oscillating image, like a flame, in the Amplatz Super Stiff guidewire that was suggestive of thrombus, despite an optimal activated clotting time (Figure 1; Videos 1-2). Therefore, we withdrew the Amplatz Super Stiff guidewire and aspirated the Mullins sheath, which was withdrawn to purge again, and a new bolus of heparin was administered. Once again, we advanced the Amplatz Super Stiff guidewire to the left superior pulmonary vein and Mullins introducer sheath, then advanced the 36 mm Amplatzer Septal Occluder (Video 2). Under fluoroscopic and intracardiac echocardiography guidance, good position was verified and the device was released successfully. After the procedure and at follow-up, the patient was asymptomatic and without detectable thrombus.

**Videos are available with the article online. Scan the QR code:**

## Discussion

A few cases of immediate formation of thrombus during transcatheter closure of an atrial septal defect have been reported, most managed by anticoagulation, abciximab, thrombolytic therapy, and surgery. However, this is the first report of thrombus formation in peculiar location, the Amplatz Super Stiff guidewire. The reason for thrombus formation in this patient is obscure, but is very likely to be procedure-related. It is likely that during unsuccessful attempt at deployment, which required withdrawal into the sheath and prolonged procedure time, thrombus formation occurred inside the sheath and was pushed out of the sheath during the subsequent attempt, despite optimal anticoagulation. The large size of the sheath might have contributed to thrombus formation due to stasis. This rare complication highlights the utility of intracardiac ultrasound for early recognition and timely treatment to avoid a potentially fatal outcome. ■

**The patient underwent transcatheter closure of an atrial septal defect under intracardiac echo guidance where acute thrombus formation periprocedure was noted, despite preprocedural anticoagulation with unfractionated heparin.**

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