Transcatheter Removal of Right Atrial Thrombus in a Child With Recent Surgical Atrial Septal Defect Closure

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Abstract: We present an original case of right atrial free-floating thrombus removal with a special retriever, in a young girl after operation for atrial septal defect closure.

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Key words: transcatheter, right atrial, thrombus

A 9-year-old girl, 19 kg, had surgical closure of a large secondary atrial septal defect at our hospital. Preoperatively, she had dilated right cardiac cavities with normal pulmonary artery pressure. She was discharged 1 week after the operation with no oral medication. Two weeks after discharge, she complained of chest pain. An echocardiogram revealed a free-floating thrombus (11 mm x 9 mm x 10 mm), much smaller than the main pulmonary artery, attached with a thin stem on the right atrial wall very close to the superior vena cava orifice (**Figure 1**).

She was started on cumarinic anticoagulants until an INR of about 2.5 was achieved. Six weeks later, no significant change in the clot size was noted; as the girl had a recent open-heart surgery, we decided to attempt to treat her percutaneously with cardiac catheterization.

Anticoagulant treatment was stopped 2 days before intervention and low-molecular-weight heparin, tinzaparin sodium, 150 IU/kg/day in a single subcutaneous dose was delivered.

Under general anesthesia, the right femoral vein was percutaneously cannulated with a 7 Fr short sheath. Heparin (50 U/kg) was administered after vascular access was obtained. An endhole 7 Fr Swan catheter was advanced from the femoral vein up to the left innominate vein and a 0.035″ J-shaped 180 cm-long guidewire was inserted and stabilized in the superior vena cava.

Over the wire, a 12 Fr Long Straight sheath (Cook Medical) was advanced into the right atrium. The Indy OTW Vascular Retriever (Cook Medical) was then inserted in the sheath. This retriever includes at the intravascular or intracavitary apex four broad loops, overlapping each other, around a central stem, closed within an 8 Fr sheath. The loops were deployed under the thrombus and slightly advanced to surround it (**Figure 2**).

With transesophageal echocardiographic guidance, the thrombus was captured by the retriever, inserted in the external long sheath, and withdrawn fragmented on the retriever loops and in the blood within the long sheath. Although we were ready for instant thrombolysis if necessary, there were no clinical, laboratory (from blood gases), electrocardiographic, radiological, hemodynamic, or angiographic signs of pulmonary embolism.

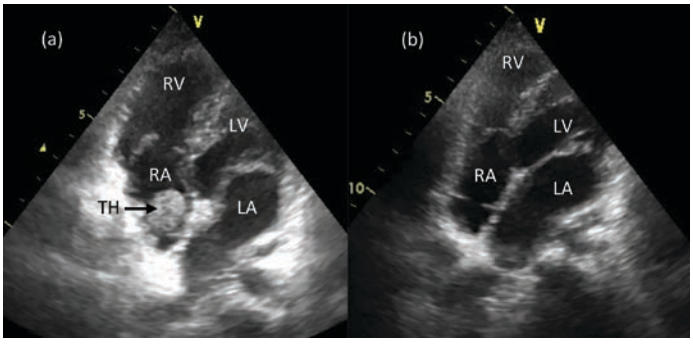

Figure 1. Echocardiogram of the child **(a)** before and **(b)** after thrombus removal. RA = right atrium; RV = right ventricle; LA = left atrium; LV = left ventricle; TH = thrombus.

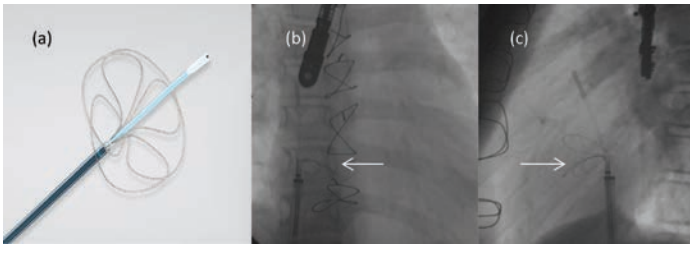

Figure 2. (a) The Indy OTW Vascular Retriever (Cook Medical). The retriever deployed in the right atrium in **(b)** anteroposterior and **(c)** lateral views (arrows).

The case and technique we describe is rather original because transcatheter clot aspiration is applied in vascular thrombosis. Transdermal atrial clot aspiration has been performed in adults[1,2] with the AngioVac aspiration device (Angiodynamics) using very wide sheaths not suitable for children. In infants and children, conservative treatment with systematic or catheter-directed[3] thrombolysis is the treatment of choice. Thrombolysis can be safely performed in children, but requires extensive monitoring and collaboration.[4] Surgical thrombectomy is kept for refractory thrombosis, as this complication is potentially fatal.[5,6] ■

Disclosure: The authors have completed and returned the ICMJE Form for Disclosure of Potential Conflicts of Interest. The authors report no conflicts of interest regarding the content herein.

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