SUCCESSFUL STENTING OF CHRONIC TOTAL OCCLUSION OF THE EPTFE GRAFT AFTER RIGHT PULMONARY ARTERY BYPASS SURGERY IN A GIRL WITH ABSENT PULMONARY ARTERY

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HISTORY AND PHYSICAL

A 12-year-old girl was admitted to our hospital for endovascular treatment of chronic total occlusion of the right pulmonary artery (RPA) bypass graft. She first visited our hospital because of heart murmur when she was two years old. She was then diagnosed as having absent right pulmonary. She underwent RPA bypass surgery with 6mm ePTFE graft. The graft became stenotic easily because it passed anterior of the ascending aorta and then had a tight curve before it went into RPA between ascending aorta and superior vena cava. After the surgery, she underwent balloon dilation of the graft stenosis every two or three years. Pulmonary perfusion scintigraphy at 12 years of age suggested total occlusion of the RPA graft (right 3%, left 97%). Prominent second heart sound and ejection systolic murmur at upper left sternal border were audible.

IMAGING

Computed tomography confirmed the diagnosis of total occlusion of the RPA bypass graft.

INDICATION FOR INTERVENTION

She showed mild shortness of breath on exertion. Cardiac catheterization revealed elevated main and left pulmonary artery pressure (57/21[39] mmHg).

INTERVENTION

The procedure was performed under local and intravenous anesthesia. An 8 French (Fr) sheath introducer was placed in the right femoral vein. Right ventriculography demonstrated total occlusion of the proximal RPA bypass graft. 6Fr AL-1 catheter could be stabilized at the orifice of the graft using 6Fr Brighttip sheath and 4Fr Multipurpose catheter. A 0.018”
Treasure 12g guidewire was passed through the graft, and 0.035” Radifocus guide wire reached peripheral RPA. Intravascular ultrasound revealed severe thrombotic stenosis of the graft. The graft was dilated with 3 x 20 mm Sterling balloon, 3.5 x 13 mm NSE balloon, and then 5mm x 30mm Sterling balloon. RPA angiography revealed 50% patency of the graft and we finished the procedure. Oral aspirin and heparin infusion were administrated and then switched to aspirin and warfarin. She discharged eight days later, after checking the patency of the graft with ultrasonography and computed tomography. However, two months later, ultrasonography and pulmonary perfusion scintigraphy suggested re-occlusion of the RPA graft. After confirming the diagnosis of the occlusion by pulmonary artery angiography, we decided to perform stent implantation. Using a 10 French (Fr) sheath, 8.5Fr Parent sheath and 6Fr AL-1 catheter, 0.035” Radifocus guidewire was passed through the graft. Because of the tight curve in the middle of the graft, we chose self-expandable 7 x 60mm Smart stent. After predilation with 4 x 30 mm Sterling and 6 mm x 40 mm Sterling balloon, Smart stent was deployed to cover the 6mm ePTFE graft. Post-procedural angiography demonstrated a widely patent stent with good antegrade RPA flow. The pressure of the main pulmonary artery decreased from 67/27(46) mmHg to 49/10(27) mmHg after stent implantation. Clopidogrel was added to aspirin and warfarin, and she discharged from the hospital with good patency of the graft.

LEARNING POINTS OF THE PROCEDURE

This is the first report of successful penetrating and stenting of chronic total occlusion of the ePTFE graft after RPA bypass surgery. Penetrating chronic total occlusion of the ePTFE graft at the pulmonary artery site with guidewire could be performed safely. Simple balloon dilation was not enough to maintain the patency of the occluded graft. Self-expandable stent might be a good option for pulmonary artery bypass stenosis/occlusion which runs anatomically complicated courses. Further study with a larger population is needed to investigate the effect of stent implantation in this setting and to establish adequate antithrombotic therapy in such cases.