

Surgical Management of Symptomatic Adventitial Cystic Disease of the Popliteal Artery as a Cause of Deep Vein Thrombosis

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To the Editor: A 67-year-old female was referred for persisted swelling in right leg despite of anticoagulation during 2 months for deep vein thrombosis (DVT) of the right popliteal vein (PV). Initial duplex ultrasonography of local clinic at 2 months ago showed the acute DVT of right PV with thrombus and dilated vein [Figure 1a]. She simultaneously complained tingling sensation and claudication in the right leg for several months. She had been on anticoagulation with warfarin (3 mg/d) for 2 months. Moreover, she denied history of hypertension and diabetes mellitus. On physical examination, vital sign was stable, and there was mild swelling in the right leg. However, there was no sign of infection and rest pain in right leg. Portable Doppler showed monophasic arterial flows in the right ankle. Laboratory findings showed prothrombin time international normalized ratio of 2.27, D-dimer of 1.54 µg/ml, and C-reactive protein of 0.22 mg/L. We checked computed tomography angiography (CTA), and it showed right popliteal artery (PA) focally occluded and PV totally collapsed by 3 cm-sized and low-density cystic mass. In addition, DVT was not detected and greater saphenous vein was patent in CTA [Figure 1b and 1c]. Hence, we thought DVT of PV might be resolved. We decided to perform cyst excision and interposition of PA with saphenous vein. Hence, we switched warfarin into low molecular weight heparin for 1-week preoperatively. Under general anesthesia, the patient was positioned prone for posterior approach. We performed S-shaped skin incision on right popliteal area and exposed small saphenous vein (SSV). Fortunately, SSV was favorable for vein graft and was harvested. After that, PV, PA, and cyst were exposed. There were severe inflammation around PV and PA. Hence, we carefully dissected those lesions [Figure 1d]. PV was totally compressed by the cyst, and there was wall thickening in PV [Figure 1d]. We thought thrombus of PV might have been resolved. During excision of cyst, we detected communication between adventitia of PA and cyst [Figure 1d]. However, there was no communication between joint cavity and cyst. We performed arteriotomy and checked nearly occlusion with intimal hyperplasia in artery wall. So, we performed segmental resection of PA and interposition with a reversed ipsilateral SSV graft [Figure 1e]. After that, we checked patent graft and good distal arterial flows by portable Doppler. The

resected cyst grossly contained transparent gelatinous material, and pathological examination showed cystic space formed between media and adventitia was containing mucoid material [Figure 1f]. At 1-week postoperatively, CTA showed that graft was patent with good flow in distal arteries, and there was no remnant cystic lesion in popliteal area [Figure 1g and 1h]. After the surgery, the patient's symptoms were improved. Anticoagulation was stopped at 1 month postoperatively. At 10 months' postoperatively, CTA showed that graft was patent without recurrent stenosis of PA.

Adventitial cystic disease (ACD) is a rare vascular disorder that mucinous cyst is developed within adventitia of artery or vein.^[1,2] Moreover, ACD primarily affects unilateral PA and predominantly occurs in young men with the fourth or fifth decade of life.^[1,3] Depending on the location and degree of the vessel affected, there are various symptoms including claudication, rest pain, burning sensation, paresthesias, or tingling sensation.^[2,4] So, symptoms of ACD in PA are usually claudications in young men.^[1-3] But, in our case, the patient was old woman complaining persisted swelling despite of anticoagulation for DVT of PV, and was diagnosed in ACD of PA. Hence, we think this is a very rare case of ACD in PA as a cause of DVT.

During evaluating for ACD, we should differentiate several entities including PA aneurysm, PA entrapment, peripheral artery disease, Baker's cyst, and fibromuscular dysplasia.^[3,4] For this, magnetic resonance angiography and CTA are helpful as in our case.^[2-4]

The management of ACD should be based on clinical symptoms and radiologic findings.^[3] Conservative treatment has been advocated for asymptomatic patients only.^[2,3] In symptomatic patients, complete resection with autologous bypass is preferred

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Received: 16-05-2018 **Edited by:** Ning-Ning Wang
How to cite this article: Lee JS, Hwang JK, Park SC, Kim SD. Surgical Management of Symptomatic Adventitial Cystic Disease of the Popliteal Artery as a Cause of Deep Vein Thrombosis. Chin Med J 2018;131:2141-2.

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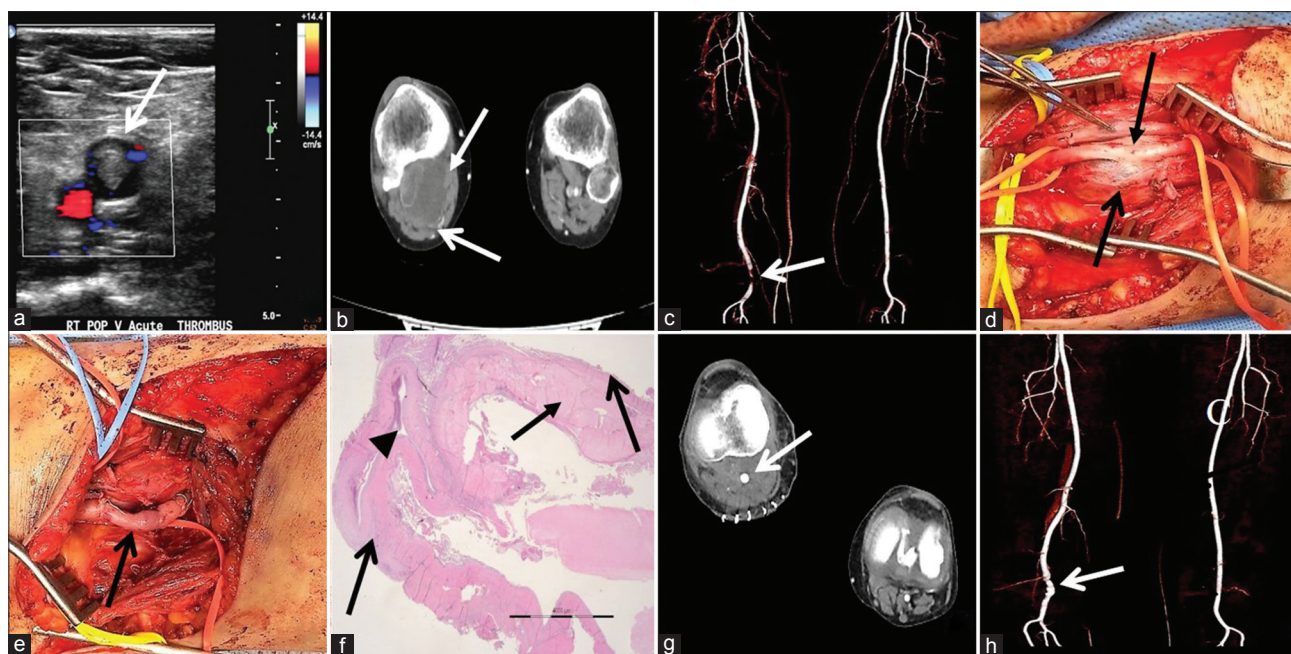


Figure 1: Cyst excision and interposition of PA with vein graft were performed successfully. (a) Duplex ultrasonography at 2 months ago. An arrow indicates DVT of PV; (b and c) Preoperative CTA. Arrows indicate cyst, totally collapsed PV, and focal occlusion of PA. (d and e) Intraoperative findings. Arrows indicate PA, cyst, and patent graft. (f) Microscopic finding with H and E stain ($\times 100$). Arrows indicate mucoid material in cyst, adventitia, and lumen of PA. (g and h) Postoperative CTA. Arrows indicate patent graft and PA. PA: Popliteal artery; DVT: Deep vein thrombosis; PV: Popliteal vein; CTA: Computed tomography angiography.

in total occlusion, whereas cyst excision or cyst evacuation with a vein patch are preferred in artery stenosis.^[1-3] It was reported that bypass with or without cyst excision provided the most durable option for both symptomatic relief and longer freedom from reintervention.^[1-3] Percutaneous aspiration and endovascular treatment are not recommended due to high recurrence rates.^[1-4] Hence, in our case, we performed cyst excision and interposition of PA with reversed SSV graft during anticoagulation for DVT in the same leg.

In a view of anticoagulation for DVT caused by ACD, anticoagulation for provoked DVT of PV was recommend into long-term anticoagulation with 3 months.^[5] Hence, in our case, anticoagulation had been continued for 3 months despite resolution of DVT in CTA. In addition, the patient of our case was old female and had variable symptoms. So, we suggest to check the possibility of multifactorial causes unrelated with ACDs in old patients.

In conclusion, we suggest that the optimal management of symptomatic ACD causing DVT in old woman should include cyst excision and interposition of PA with saphenous vein graft accompanied by long-term anticoagulation for DVT.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understand that her name and initial will not

be published and due efforts will be made to conceal her identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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