PTA for Upper Limb Ischemia and Giant-Cell Arteritis

An alternative approach to treating this rare presentation in patients who are refractory to medical therapy.

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Giant-cell arteritis (GCA) is a chronic vasculitis of large- and medium-sized vessels, primarily affecting patients who are older than 50 years of age.[1] The cranial branches of aortic arch vessels are the most commonly involved, although as many as 15% of patients with GCA experience upper extremity claudication, usually due to subclavian and axillary artery involvement.[1,2]

Revascularization of upper extremity arterial occlusions and stenoses related to GCA is rarely necessary due to the robust development of collateral vessels and improvement in symptoms with medical therapy.[1] Therefore, there are few reports of successful percutaneous transluminal angioplasty (PTA) of upper extremity vessels in the setting of GCA in the cardiovascular literature. PTA has been shown to be an effective and safe treatment in patients with GCA and is the procedure of choice for upper extremity arterial lesions in GCA patients who are refractory to medical management.[3,4]

In this article, we describe successful PTA for a severe axillary artery lesion in a patient presenting with upper extremity claudication in the setting of GCA.

CASE REPORT

A 67-year-old man with a significant medical history of type 2 diabetes mellitus, hypertension, hyperlipidemia, and polymyalgia rheumatica was referred to our clinic for evaluation of bilateral lower extremity claudication. Computed tomographic angiography revealed diffuse bilateral superficial femoral artery (SFA) atherosclerosis.

Prior to planned percutaneous SFA revascularization, the patient was admitted to our hospital with a febrile illness that included severe right upper extremity claudication that

Figure 1. Magnetic resonance angiography revealed multifocal narrowing of the axillary arteries, consistent with vasculitis.

was present even with activities as minimal as brushing his teeth and hair. He had no headaches, jaw claudication, nor vision changes. Brachial and radial pulses were absent on the right. Erythematous blanching patches were present on his chest and back. His erythrocyte sedimentation rate and C-reactive protein level were markedly elevated. The findings of an infectious workup, including multiple blood

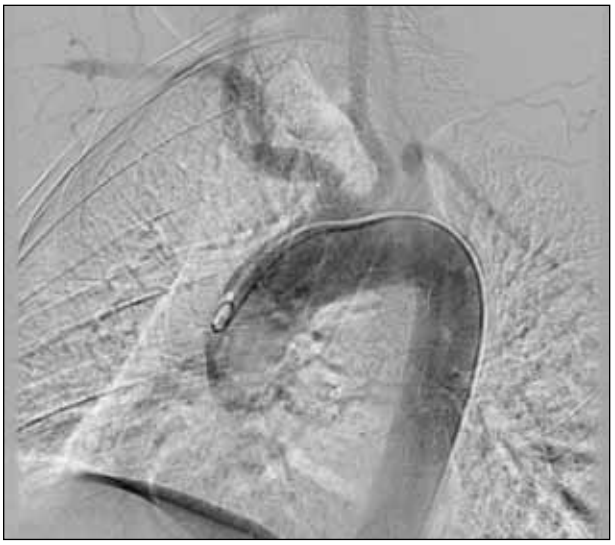

Figure 2. Ascending aortography revealed no significant disease in the aortic arch nor in the origin of the great vessels.

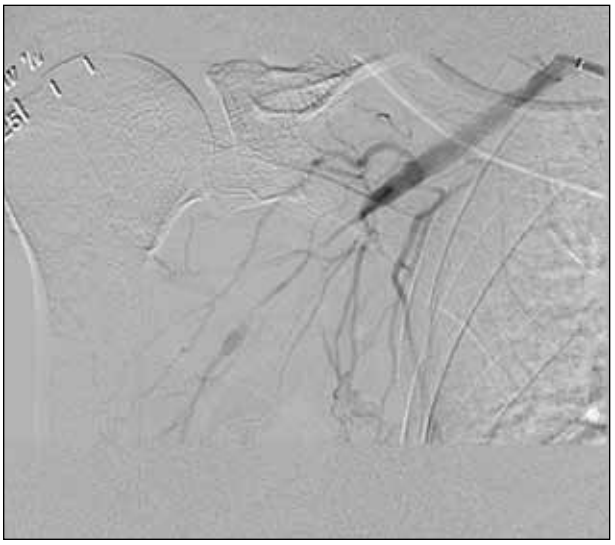

Figure 3. Proximal axillary artery with a long, noncalcified, 99% stenosis with extensive collateralization.

cultures, were negative. Magnetic resonance angiography of his chest, neck, and proximal upper extremities revealed multifocal narrowing of the axillary arteries, consistent with vasculitis (Figure 1). GCA was diagnosed, and steroid therapy was initiated. After 3 months of a high-dose prednisone regimen, all of the patient's symptoms had improved, and staged angioplasty and stenting to severe atherosclerotic disease in his bilateral SFAs was successfully performed.

He returned to the clinic 1 month later with recurrent right upper extremity claudication, and despite the addition of methotrexate, he was unable to put on his shirt without right hand pain. Brachial and radial pulses on the right were still absent. Continued medical therapy, as well as endovascular and surgical interventions were discussed, and we performed right upper extremity angiography with planned endovascular intervention to amenable lesions.

Right common femoral access was achieved using a 6-F system. After ascending aortography revealed no significant disease in the aortic arch nor in the origin of the great vessels (Figure 2), a 4-F angled Glidecath (Terumo Interventional Systems, Inc., Somerset, NJ) and a 0.035-inch angled Glidewire (Terumo Interventional Systems, Inc.) were used to engage the right subclavian artery for selective right upper extremity angiography. The proximal axillary artery had a long, noncalcified, 99% stenosis with extensive collateralization (Figure 3). Two-vessel run-off to the hand was without significant ulnar, radial, or palmar arch lesions. An Emboshield Nav6 distal embolic protection system (Abbott Vascular, Santa Clara, CA) was placed beyond the stenosis (Figure 4). Multiple prolonged inflations were performed with 3 mm X 30 mm and 5 mm X 30 mm Vascutrak balloons (Bard Peripheral Vascular, Inc., Tempe, AZ) to the axillary lesion. (Figure 5). The patient was given 300 mg of clopidogrel postprocedure and was discharged the next day.

One month after PTA, the patient returned to the office and reported no return of right upper extremity claudication. His right brachial and radial pulses were palpable. He was continued on daily aspirin and clopidogrel therapy, as well as maintenance prednisone and methotrexate.

DISCUSSION

Subclavian, axillary, and brachial artery inflammatory obstructions due to GCA are rare causes of upper extremity ischemia but may be associated with significant morbidity. Medical therapy with corticosteroids and immunosuppressive agents is the standard of care for these symptomatic lesions, given the development of collateral vessels and rapid regression of stenoses typically achieved with this method.[1,2] When claudication persists despite maximal medical therapy, surgical or percutaneous revascularization must be considered.

Bypass surgery for the treatment of upper limb ischemia of all causes is rare, accounting for only 4% of all vascular surgical procedures.[5] A recent retrospective analysis of 23 patients undergoing surgical bypass for upper limb ischemia of all causes demonstrated an 82.6% primary graft patency rate and a 100% limb salvage rate at 34 months.[5] However, surgical bypass in patients with GCA can be difficult, given the diffuse inflammatory nature of the arteriopathy and the waxing and waning course of the stenoses.

PTA is an alternative to surgery for the treatment of symptomatic upper extremity vessel stenoses related to GCA, although the method is limited by high rates of restenosis. Currently investigational, the use of drug-eluting bal-

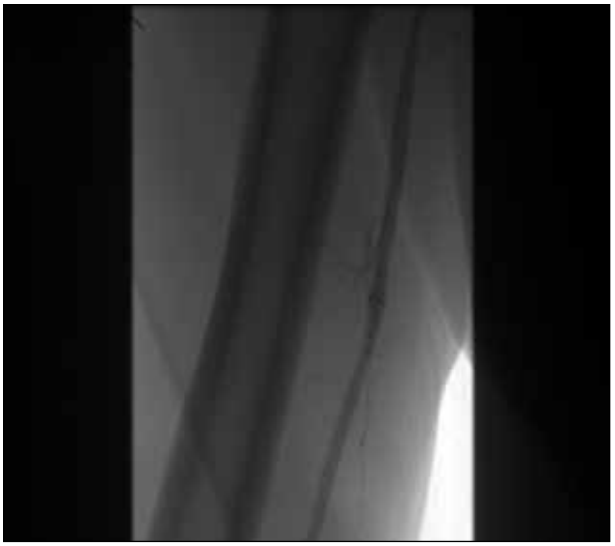

Figure 4. An Emboshield Nav6 distal embolic protection system was delivered to the brachial artery.

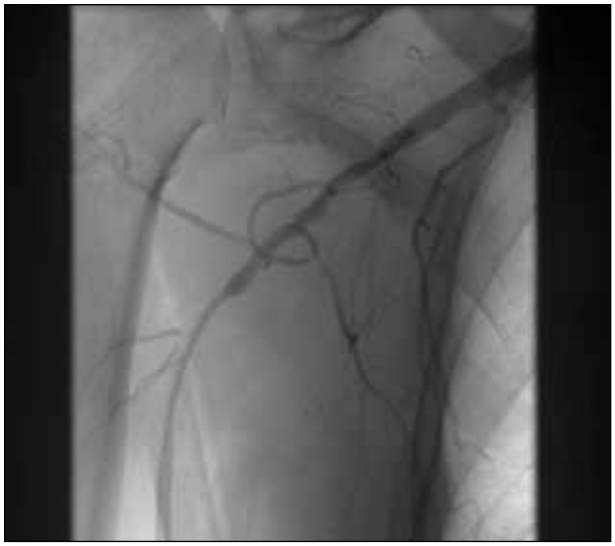

Figure 5. Angiographic result after multiple prolonged inflations were performed with Vascutrak balloons to the axillary lesion.

loons and bioabsorbable stents may decrease this limitation in the near future. Vasculitic lesions of the upper extremities are twice as likely to restenose as those related to atherosclerosis.[6] Thirty upper extremity lesions treated with PTA in 10 patients with medicine-refractory GCA were recently evaluated. Although all of the lesions were successfully treated, primary patency at 24 months was 65.2%, and 50% of all treated lesions required reintervention.[3] Even though these patency rates are lower than those reported in earlier case series,[4] PTA remains a safe and effective alternative for lesions that are refractory to corticosteroids and immunosuppressive agents.

Embolic protection devices are widely used during carotid artery stenting, but their use during PTA of other aortic arch and upper extremity vessels is less established. To our knowledge, this is the first report of successful PTA to an axillary artery stenosis related to GCA that utilized distal embolic protection. Appropriate use of distal protection devices in upper extremity interventions has not yet been established, but in infrainguinal disease, intervention in the setting of critical limb ischemia, thrombotic occlusions, and chronic total occlusions increases the incidence of significant peripheral emboli. In addition, the use of atherectomy devices and coexisting end-stage renal disease and diabetes have been implicated and also warrant distal protection.[7-9]

CONCLUSION

Percutaneous management of upper extremity stenoses related to GCA is a safe and effective intervention for upper extremity claudication when medical therapy has failed to improve patient symptoms. Embolic protection devices may limit distal embolic complications from angioplasty to these friable stenoses, although further investigation is warranted. ■

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