

Spontaneous Rupture of the Dorsalis Pedis Artery: Report of a Case

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A 52-year-old man underwent the repair of a spontaneous rupture of the dorsalis pedis artery. We considered that untreated hypertension was one possible cause of the rupture. This is a rare case of spontaneous rupture in a peripheral artery. (Ann Thorac Cardiovasc Surg 2007; 13: 290–292)

Key words: dorsalis pedis artery, spontaneous rupture, pseudoaneurysm

Introduction

A spontaneous arterial rupture of the dorsalis pedis artery (DPA) has not been reported in the literature, although there was a case report of peripheral arterial rupture associated with Ehlers-Danlos syndrome (EDS). To the best of our knowledge, this is the first description of a case of spontaneous rupture in the DPA caused by hypertension.

Case Report

A 52-year-old man was referred to our clinic because of the acute onset of pain and swelling of the dorsal part of his right foot, which had developed one month previously. A physical examination revealed purplish areas of discoloration around the right ankle, though he specifically denied any history of trauma or injury to the foot. The swelling was limited to the dorsal part of his right foot and did not extend above the ankle. Pulsations of the dorsalis pedis and tibialis posterior arteries were equally palpable bilaterally. However, the right DPA was ectatic in comparison with the other side. We palpated the right DPA as being not a pulsatile tumor, but rather as arterial dila-

tation. His past medical history was unremarkable, and he had no history of ankle fracture. Physical examination revealed a diastolic murmur and blood pressures of 194/111 and 204/84 mmHg in the arm and foot, respectively. These pressure readings had not been previously detected, and he was not being treated for hypertension. Antihypertensive administration was started after this diagnosis. Doppler echocardiography revealed mild aortic regurgitation. An ultrasound study of the foot showed a hypoechoic mass, which measured 2.0×1.2 cm, connected to the right DPA. A color-flow duplex scanning showed a color flow from the artery into the mass. Angiography revealed a saccular aneurysm in the DPA (Fig. 1). The serum test was negative for antinuclear and antismooth muscle antibodies. C-reactive protein was negative also. We scheduled a reconstruction of the DPA after an aneurysmectomy with a diagnosis of a saccular aneurysm in the DPA. Computed tomography (CT) performed one week before the operation showed no enhancement by contrast within the aneurysm (Fig. 2). The operation was performed as soon as possible because we discovered a report that acute forefoot ischaemia could be caused by a DPA aneurysm, though the present aneurysm resulted in thrombus.¹⁾

The position of the aneurysm was confirmed by ultrasonography before the operation, and the incision region was determined. Under spinal anesthesia and a thigh tourniquet, the proximal and distal sides of the DPA to the aneurysm were exposed between the tibialis anterior and extensor hallucis longus tendons. After intercepting the peripheral blood flow with the thigh tourniquet, the su-

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Fig. 1. Digital subtraction angiogram revealing a saccular aneurysm (arrow) originating from the right dorsalis pedis.

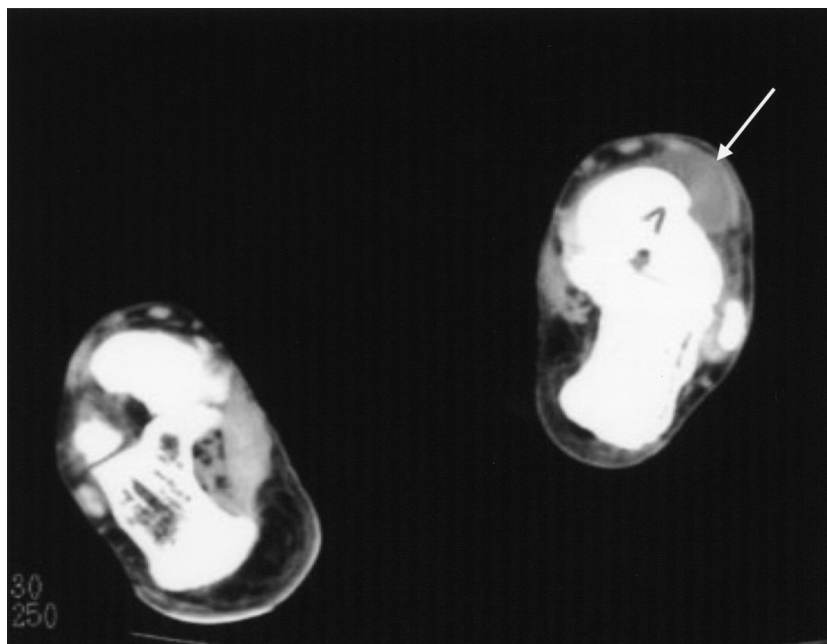


Fig. 2. Computed tomographic scan showing no enhancement by contrast within the mass (arrow).

perior extensor retinaculum over the aneurysm was split. However, the one that appeared to contain the aneurysmal wall could not be identified, though a large amount of hematoma was identified outside of the DPA. Pulsatile bleeding was encountered when the hematoma was removed and the artery interception on the proximal side was released. A perforation of about 2.2×2.0 mm was found on the outside of the DPA when it was exposed after the blood flow was again intercepted (Fig. 3). We made a diagnosis at this time of an idiopathic ruptured DPA. Because it would have been impossible to suture the DPA directly if a significant portion of the artery wall was excised for histopathological analysis, only a small portion was excised. The artery was repaired directly with a 7-0 polypropylene suture. After the operation, the pulsation of the DPA on the distal side was excellent. Regrettably, the properties of the vessel wall could not be identified by pathological analysis. The patient's postoperative course was uneventful. At a 1-

year follow-up, he has complete resolution of symptoms, no recurrence of swelling, and patent of the DPA. His blood pressure is still being controlled with antihypertensive medication.

Discussion

Although 21 spontaneous ruptures of the thoracic aorta have been reported in Japan, there have been no reports regarding spontaneous peripheral arterial ruptures other than those associated with Type IV EDS.²⁾ This patient did not meet the diagnostic criteria for EDS. Vasculitis and collagen disease could not be completely ruled out from his serum and clinical features. In addition, the patient denied any history of antecedent trauma to the foot. We considered that untreated hypertension was one of the possible etiologies of the spontaneous rupture, though we cannot say for certain because there were no histological findings. His family doctor doubted the existence of vascular disease because there was only a local swelling of the foot without bruising or other injury. It was possible to make a rapid diagnosis because color duplex scanning was performed almost immediately. Millett et al. reported a case of idiopathic pseudoaneurysm of the DPA that mimicked pigmented villonodular synovitis.³⁾ In the present case, we did not suspect artery disease based



Fig. 3. Dorsalis pedis artery showing a 2.2×2.0 mm perforation (arrow).

on the examination results, though there was no pulsatile tumor either. In the second month after onset of the disease, a CT scan of the foot disclosed clot formation in the arterial rupture region. This finding suggests that the antihypertensive treatment was effective. If more time had passed without a diagnosis of this disease, we may not have found the arterial rupture. A review of the literature revealed a report on a pseudoaneurysm without trauma.⁴⁻⁶ If we had not made an initial diagnosis of arterial rupture, this patient may in the future have demonstrated signs and symptoms of a saccular aneurysm.⁷ Cases diagnosed as a pseudoaneurysm without trauma may present with clinical symptoms similar in appearance to those in our case.

We performed reconstruction using direct suturing in this case and maintained blood flow in the DPA. Some reports on DPA aneurysms have suggested that not reconstructing the DPA is a safe strategy.⁴⁻⁶ However, because arteries in the foot, unlike arteries in the hand, may undergo obstructive changes because of such diseases as arteriosclerosis, we recommend that reconstruction be performed if at all possible.

References

1. Tempest HV, Wilson YG. Acute forefoot ischaemia: an unreported complication of dorsalis pedis artery aneurysm. *Eur J Endovasc Surg* 2001; **22**: 472-73.
2. Sugawara Y, Bav K, Imai K, et al. Successful coil embolization for spontaneous arterial rupture in association with Ehlers-Danlos syndrome type IV: report of a case. *Surg Today* 2004; **34**: 94-6.
3. Millett PJ, Potter H, O'Malley MJ. Idiopathic pseudoaneurysm of the dorsalis pedis artery mimicking pigmented villonodular synovitis. *Foot Ankle Int* 1999; **20**: 42-3.
4. Lieberman JR, Goldstock LE, Jacobs RL. Pseudoaneurysm of the dorsalis pedis artery after Lisfranc amputation. *Foot Ankle* 1991; **12**: 123-4.
5. Morettini G, Ventura M, Marino GA, et al. Isolated aneurysm of the dorsalis pedis artery. *Eur J Vasc Endovasc Surg* 1995; **9**: 485-6.
6. McKee TI, Fisher JB. Dorsalis pedis artery aneurysm: case report and literature review. *J Vasc Surg* 2000; **31**: 589-91.
7. Yamaguchi S, Mii S, Yonemitsu Y, et al. A traumatic pseudoaneurysm of the dorsalis pedis artery: report of a case. *Surg Today* 2002; **32**: 756-57.