

## CLINICAL VIGNETTE

# An Unusual Cause of a Lump on the Foot: Aneurysm of the Dorsalis Pedis Artery

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A 58-year-old woman came to the office complaining of a foot lump, which had been present for several years. The lump became a concern because it limited her choice of footwear; some shoes caused irritation because of rubbing on the lump.

On examination, she had a small mass, which was pulsatile on the dorsum of the right foot. This mass was smooth and nontender. She did not recall any foot trauma or exactly when it had developed. Duplex scanning of the right foot revealed an aneurysmal dilation of the dorsalis pedis artery of 6.5 mm in diameter and 15 mm in length. Arterial diameter above and below was noted to be about 2mm. She was referred for vascular surgery evaluation, and the consultant did not recommend any intervention at that time.

Her past medical history was remarkable for hypertension, hypercholesterolemia and remote smoking of fifteen pack-years. The patient had no collagen vascular disease or diabetes. Family history revealed coronary artery disease in her father.

She continued to be seen intermittently as a regular office patient. She had no particular complaints referable to the mass but she continued to avoid shoes, which might cause compression of the site. At each office visit, her foot was rechecked and clinically the lump seemed to be unchanged and nontender. Repeat duplex scanning four and one-half years later did not show any progression in size of the aneurysm. The reported measurements were 6.2mm by 14.9 mm.

Her foot was regularly evaluated at subsequent office visits, and the aneurysm remained clinically stable. Four years later she was referred to a podiatrist for foot pain. He noted the pulsatile mass, reported no thrill and did not believe the aneurysm was the source of her discomfort. He also advised no intervention regarding the aneurysm unless she developed pain at that site. He recommended orthotics for her symptoms.

Two and a half years later the patient fell at home landing on her right side. She was seen for an urgent care visit complaining of right shoulder pain and low back pain for which she had taken some naproxyn. She had x-rays of the right shoulder, humerus and lumbosacral spine; these were negative for any acute fracture injury. Two days later she was seen for a follow up office visit, and on examination of her right foot there had been a dramatic increase in the size of her pulsatile mass; this was the first time in eleven years that there had been a noticeable clinical change. She now had tenderness on palpation of the aneurysm.

The patient was seen again by a vascular surgeon. Angiogram of the right lower extremity revealed an aneurysm of 14 mm diameter and 16 mm in length and a surgical resection was performed. The pathologist reported a pseudoaneurysm and inflamed granulation tissue, but no organisms on fungal and gram stains. She has had no further difficulty with the foot and has no limitation in her footwear.

Lumps on the foot are not infrequently found in the ambulatory setting. They are more common in women than in men. Patients may not seek evaluation since many lumps are asymptomatic, but presenting complaints include pain, itching, paresthesias, restriction of movement and limitation of choice of foot wear. The most common causes of foot masses are ganglion cysts (24%), tendon and ligament related lesions (16%) and bony lesions (11%). Some other causes include fibrous lesions, synovial lesions, tumors and inflammatory nodules. The foot is the most common site for ganglion cysts after the hand and the wrist. Malignant tumors are rare<sup>1-3</sup>.

Our patient presented with the common problem of a lump on her foot but she proved to have an unusual cause. Aneurysms of the dorsalis pedis arteries are rare. Five to ten percent of individuals do not even have this artery. Patients may be asymptomatic, or they may complain of itching, pain, paresthesias and the need to restrict the choice of footwear. These are

the same symptoms as for other foot lumps. However, these are pulsatile. A painful aneurysm may be more likely to rupture<sup>4-8</sup>.

A ganglion cyst or other lesion could also present as a pulsatile mass if it were adjacent to the artery. It is not advisable to attempt a needle aspiration of a pulsatile mass as it could be an aneurysm, and bleeding or other complications might result. One study reported such a case where the attempted aspiration resulted in a syringe filled with bright red blood. The initial evaluation should be with duplex scanning; MRI or angiography has been used<sup>4</sup>.

A dorsalis pedis aneurysm is classified as either a true aneurysm or a pseudoaneurysm. The distinction is made histopathologically as a pseudoaneurysm lacks a true arterial wall. Risk factors for atherosclerosis, such as smoking, hypertension, hyperlipidemia and diabetes, are also risk factors for true aneurysms. Most dorsalis pedis aneurysms, however, are pseudoaneurysms and occur after trauma which may be unremembered, remote, minor or repetitive. "The etiology of pseudoaneurysms may include penetrating trauma, surgery, idiopathic, intravenous drug abuse, orthopedic hardware and ankle sprain; however, they are most commonly the result of nonpenetrating blunt trauma." There is a case report of a pseudoaneurysm developing in a man who repetitively had kicked a soccer ball<sup>4-9</sup>.

Treatment options include close observation of small lesions; vascular repair with ligation; or vascular repair with resection and repair of the artery with the goal of maintaining blood flow from that vessel to the foot. Before ligation, the alternative blood supply and runoff to the foot as well as the patient's overall status, age and risk factors for future arterial disease need to be evaluated. Surgical treatment goals include amelioration of symptoms and prevention of future complications such as rupture, thrombosis, embolism and foot ischemia<sup>5,10,11</sup>.

Asymptomatic or not, foot lumps are common findings in patients during routine office visits. While an aneurysm of the dorsalis pedis artery is infrequent, it is easy to diagnose. It is clearly visible, pulsatile on palpation and diagnosed with a simple noninvasive duplex scan. It is believed to occur more commonly than reported as an asymptomatic patient may not bring it to the doctor's attention. A change in size or the development of symptoms should prompt an evaluation and potential therapeutic intervention.

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