

Acquired Arteriovenous Fistula of the Right Forearm Caused by Repeated Blunt Trauma: a Report of a Rare Case

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In acquired arteriovenous fistula (AVF), there is usually a history of penetrating injury and hemorrhage. We report a very rare case of an elderly man with acquired AVF of the right upper extremity without any history of penetrating trauma and hemorrhage, but with a history of repeated blunt trauma on his right forearm. Although no surgery was performed for the AVF, it was concluded close follow up would be prudent. (Ann Thorac Cardiovasc Surg 2005; 11: 59–62)

Key words: acquired arteriovenous fistula, blunt trauma

Introduction

Acquired arteriovenous fistula (AVF) is almost exclusively the result of penetrating trauma, and there is usually a history of hemorrhage. Typically, the patient demonstrates a thrill and bruit over the site of injury. Because most acquired AVFs are due to traumatic penetrating wounds, concentrated experience in their management was reported in World War II, Korean Conflict, and the Vietnam War. A less concentrated but continuing experience has been reported over the last three decades as the result of civilian violence in most large American urban regions. A steadily growing number of iatrogenic AVFs is a reflection of increasing percutaneous procedures performed in the groin for a multitude of diagnostic and therapeutic cardiac and radiographic procedures. We report a very rare case of a man with acquired AVF of the right upper arm without any history of penetrating trauma and hemorrhage, but with a history of repeated blunt trauma on his right forearm.

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Case Report

A 66-year-old man presented with a small pulsating tumor in the right forearm with occasional, slight pain. He had recognized the tumor one month prior to visiting the hospital. No history of a penetrating trauma or hemorrhage at the site of the tumor was found, but he had been a storekeeper for over 30 years. He often carried large, heavy boxes with both forearms, and the site of the tumor on his right forearm in particular had been pressed repeatedly while lifting and carrying the boxes. Physical examination revealed a palpable 2 cm thick mass with a diameter of 2 cm on the right forearm without pain on pressure and no signs of ischemia in the right fingers. On auscultation, no bruit was heard over the tumor site. An ultrasound scan revealed a 2 cm vascular mass on a dilated vein with fast blood flow and no communication between the arteries and veins was detected (Fig. 1). A CT scan and MRI also showed venous dilation and early venous filling moreover, there was no signs of arteriovenous malformation (AVM) which extends into the bone and muscle tissues (Fig. 2). AVF was strongly suspected based on these examinations, however, no communication between the arteries and veins was observed. Moreover, there were no signs of an AVM that had extended into the bone and muscle tissues. On angiography, this vascular mass was found to be an AVF between a branch of the right cephalic vein and right radial artery (Fig. 3). An AVF was identified by the presence of afferent arteries with early venous filling and simultaneous visualiza-

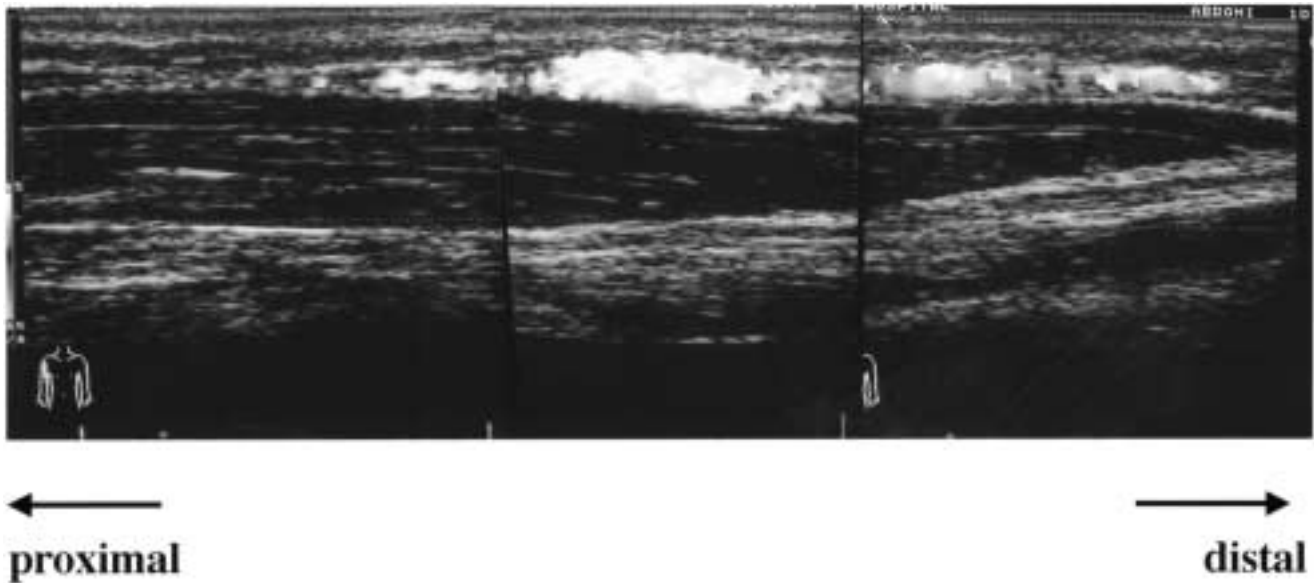


Fig. 1. Color doppler ultrasound scan revealed a 2 cm vascular mass on a dilated vein with fast blood flow and no communication between the arteries and veins was detected.

tion of the arteries and veins. No dilated artery was seen but several small collateral arteries entered the vein causing venous dilation. Based on the results of these examinations, a diagnosis of an acquired AVF was made and conservative observation was conducted. During a follow-up examination 1 year later, the size of the AVF had not changed and the patient was free of symptoms.

Discussion

In general, abnormal communication between an artery and vein may either be congenital or acquired. Most physicians prefer the term arteriovenous fistula (AVF) for acquired lesions and arteriovenous malformation (AVM) for congenital lesions.¹⁾ Acquired AVFs are almost exclusively the result of a penetrating trauma caused by a knife, bullet, or other missile with simultaneous injury to an adjacent artery and vein.²⁾ Robbs and colleagues reported 202 traumatic AVF cases.³⁾ In their report, penetrating trauma accounted for 98% of the injuries caused mainly by stabs (63%) and missile wounds (22%). AVFs also may occur due to neoplasm, iatrogenic injury, such as after suture ligation or percutaneous puncture for diagnostic study.⁴⁾ Because traumatic iatrogenic vascular injuries occur most often in the extremities, the arms and legs are the main sites for AVF. In acquired lesions, in which an injury has produced an AVF, there is usually a history of hemorrhage.^{5,6)} In the present case, the patient

did not have any history of penetrating trauma or hemorrhage. He had not been aware of any trauma at the site of the AVF although he had regularly carried large, heavy boxes, including electrical household appliances, at work for many years. Typically, a patient with an AVF demonstrates a thrill and bruit over the site of injury, whereas the appearance of these characteristic signs can be delayed because of thrombus occluding the arteriovenous communication. In this case, no bruit was heard and no thrill was palpated over the tumor site. On the other hand, AVMs develop spontaneously as a result of developmental abnormalities. In contrast to acquired lesions, the clinical manifestations of AVMs are protean due to their widespread nature. This patient did not show any signs of Klippel-Trenaunay syndrome nor Parkes Weber syndrome. It is difficult to distinguish an AVM from an acquired AVF without penetrating trauma and hemorrhage. To the best of our knowledge, only one case of development of an AVF following blunt trauma has been described⁷⁾ and the differential diagnosis of an AVF following blunt trauma has not yet been reported. In the reported case in the literature, the patient had gradually developing massive swelling of the right thigh after sustaining a blunt trauma. Therefore, there has not been a reported case of an AVF following repeated blunt trauma without penetrating injury and hemorrhage. In this case, CT, MRI, and echocardiography were helpful at making a diagnosis of an AVF, however, only angiography made the diagnosis

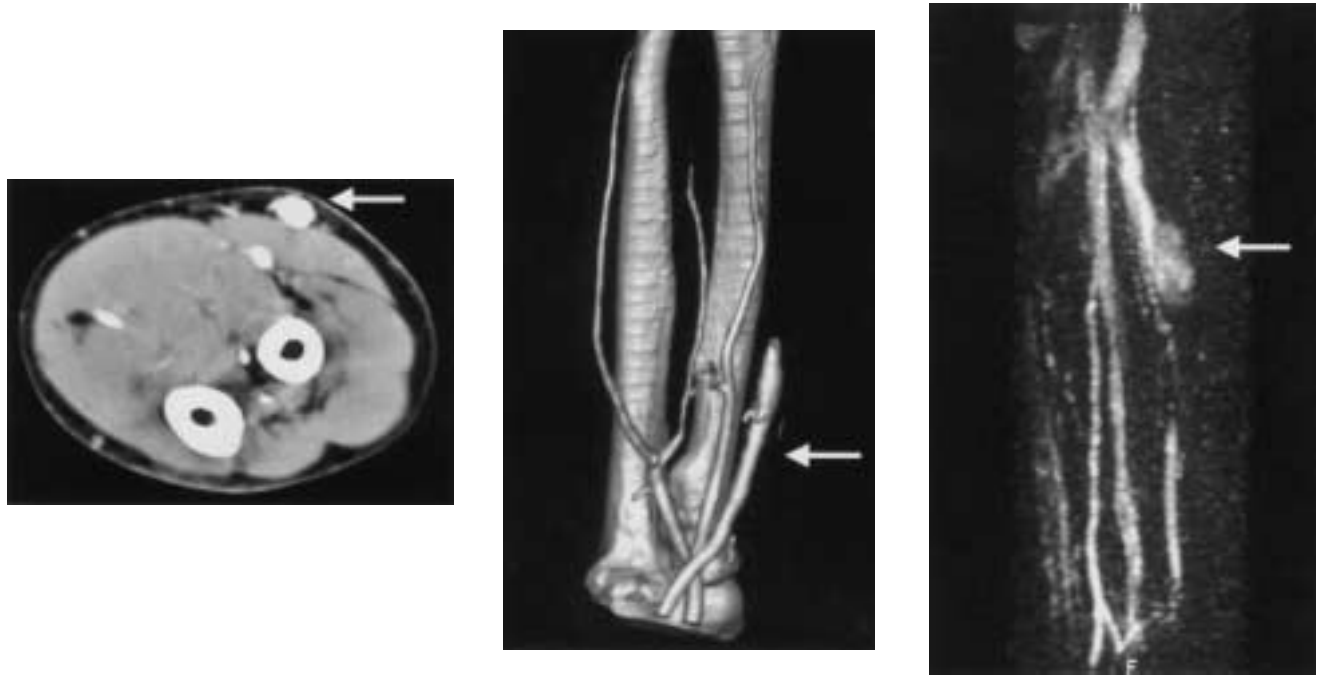


Fig. 2. Contrast enhanced CT scan (A), Three-dimensional CT scan (B) and MRI of the right forearm showed venous dilation and early venous filling. The right radial artery and the cephalic vein (arrows) were enhanced simultaneously. A | B | C

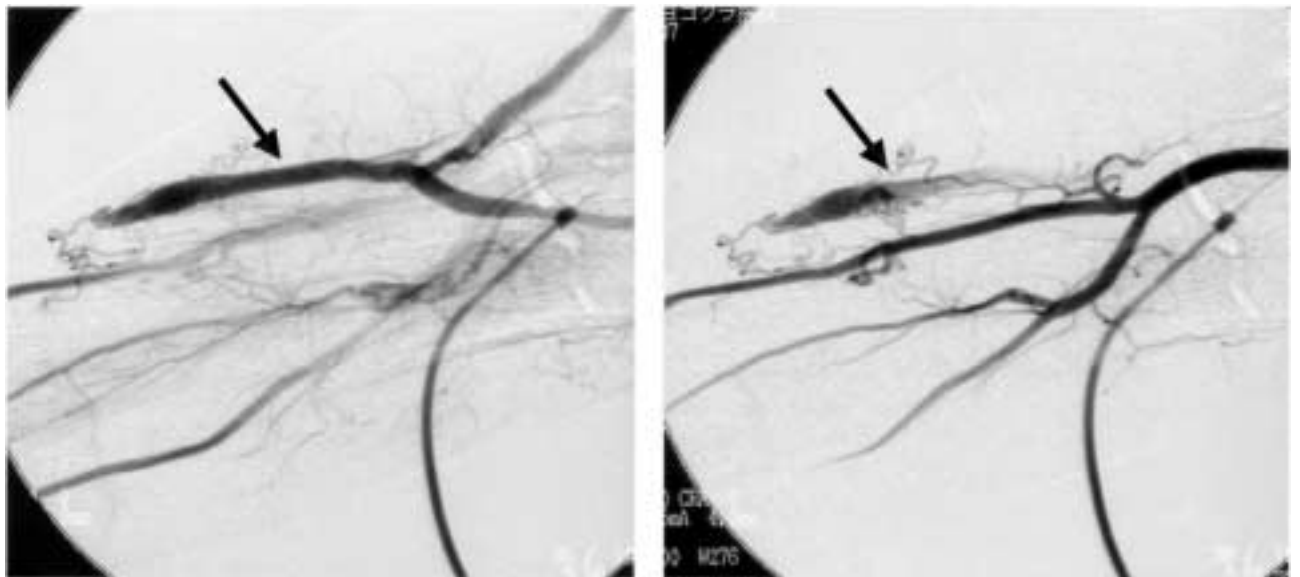


Fig. 3. Angiogram delineated AVF between a branch of the right cephalic vein and radial artery. Black arrows indicated dilated right cephalic vein.

possible. In terms of treatment, we have not performed any surgery or administered medication because the patient is asymptomatic and unwilling to have treatment. In addition, according to the angiogram, only small arteriovenous connections were found, suggesting to us that

obliterating these connections by catheter intervention was not feasible and that the connected vessels may not present during surgery so an operation should not be considered. Fortunately, the size of the venous dilation in the right forearm has not changed during the 2-year-follow-up.

However, we believe long-term follow-up is needed.

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