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Ruptured Popliteal Artery Aneurysm
A Case Report

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A high index of suspicion for popliteal aneurysms must be present when evaluating a popliteal mass. Though typically pulsatile, in the presence of chronic thrombosis, the absence of a pulse may make the diagnosis even more difficult. A case is presented that illustrates this point, where an 83-year-old man presents following the biopsy of what turned out to be a very large popliteal aneurysm. In the presence of chronic thrombosis and adequate collateral flow, decompression and ligation of any feeding vessels is typically sufficient. These patients must be followed lifelong for the development of other associated aneurysms.

Introduction

Popliteal artery aneurysms, though uncommon, may be a significant cause of patient morbidity and limb loss. These are frequently bilateral, and once diagnosed, aneurysms at other sites should be excluded owing to a high correlation with extrapopliteal aneurysms. Aneurysm rupture is rare, as most present with thromboembolic symptoms. Elective repair should be performed whenever possible to optimize graft patency, as amputation rates may be exceedingly high once vessel thrombosis and embolism occur. We present an unusual case of a very large ruptured popliteal aneurysm that spontaneously thrombosed before operative decompression.

Case Report

An 83-year-old man with mild dementia and severe chronic obstructive pulmonary disease presented with profound hypothermia, hypotension, and altered mentation following biopsy of a left thigh mass performed earlier in the day. Following his evaluation in the emergency department, he was diagnosed with urosepsis, immediately started on antibiotics, and required pressor support during his initial resuscitation. On examination, a large nonpulsatile mass was noted on the medial aspect of his distal thigh where he had the biopsy taken (Figure 1). Both extremities were well perfused, with pitting edema below
the knee on the left. An unenhanced computed tomograph was obtained to investigate the soft tissue mass and revealed a 3.7 cm partially thrombosed popliteal aneurysm on the right and a 14 by 9 cm contained rupture of a left popliteal aneurysm. Duplex ultrasonography revealed deep venous thrombosis of the left popliteal vein beginning at the site of the large thrombosed aneurysm. Magnetic resonance angiography confirmed the presence of a 13.3 cm contained rupture of a left popliteal aneurysm (Figure 2). In addition, a 4 cm contralateral popliteal aneurysm was identified, as was bilateral popliteal artery occlusion with reconstitution of the tibioperoneal trunk and 2-vessel runoff, bilaterally. Once hemodynamically stable, the patient was taken to the operating room for decompression of the large contained rupture on the left. This was approached medially and upon entering the aneurysm sac a large amount of thrombus was noted. No patent feeding vessels were identified within the aneurysm sac (Figure 3). The cavity was irrigated and closed over a drain. Postoperatively, the patient has done well and both extremities remain well perfused with normal motor and sensory function.

Discussion

Popliteal artery aneurysms are the most common among peripheral artery aneurysms. Patients are typically male and in the sixth or seventh decade of life at the time of diagnosis. Bilateral aneurysms are frequent, occurring in 40–60%. Extrapopliteal aneurysms are also frequently encountered in these patients. The most common sites are in the femoral (38–48%) and aortic (36–58%) positions and may occur in up to 78% of cases in the presence of bilateral popliteal involvement.

While many are asymptomatic, up to three quarters may present with symptoms, usually of lower extremity ischemia (65%) or compression of adjacent structures (11%). Aneurysm thrombosis and thromboembolism are most common, resulting in ischemia, and are largely responsible for the high incidence of complications (18–35%), including amputation rates upward toward 24%. Aneurysm rupture is rare, being known to occur in only 1–5% of cases. When rupture does occur, however, it is associated with higher rates of complications including ischemic neuropathy, limb loss, and possibly death.
Depending on the presentation the diagnosis may not be suspected. The differential diagnosis includes acute deep venous thrombosis, limb ischemia, ruptured Baker’s cyst, abscess, or an enlarging soft tissue mass. In the presence of a palpable pulsatile mass, a contralateral aneurysm, or a high index of suspicion, duplex ultrasonography should be performed to confirm the diagnosis. Despite close surveillance using duplex ultrasonography, up to three fourths of patients develop complications requiring surgical intervention within 5 years, most occurring during the first 2 years. Elective intervention should be considered in the presence of an aneurysm greater than 2 cm or in the presence of intraluminal thrombus, regardless of the size of the aneurysm. Magnetic resonance (MR) angiography or conventional contrast angiography may be used to evaluate the remainder of the vasculature and assist in planning the definitive repair.

Elective arterial reconstruction is best performed using autologous vein and has 5-year graft patency rates of 70% to 80% and limb salvage rates approaching 100%. Either the medial or posterior approach may be used and depends on the size and location of the aneurysm. With large aneurysms having compressive symptoms, the posterior approach is usually best. This position often limits the accessibility to the proximal saphenous vein, and this should be anticipated in planning the procedure. Emergent presentation following thrombosis or thromboembolism is associated with decreased graft patency and limb salvage. The use of preoperative intraarterial thrombolytic therapy can significantly improve immediate graft patency with improved reestablishment of distal runoff and long-term limb salvage in these patients, which may be as high as 100% at 5 years. If rupture is suspected, management should be prompt and may include either ligation or bypass. In the absence of limb ischemia, ligation alone should be considered. Care should be taken to make certain that all feeding vessels are identified and ligated to prevent any continued risk of rupture.

Endovascular repair of popliteal aneurysms has been described. Though technically possible and in many respects a more desirable, less invasive approach, owing to the proximity to the knee joint, concerns remain regarding the long-term durability of these repairs. A recent review has demonstrated a 44% acute thrombosis rate, though the use of thrombolytic agents may assist with salvaging these grafts. Additionally, the endovascular approach does not address compressive symptoms, which are present in 10–15% of patients on presentation, and thus it should not be used in these situations.

New aneurysm formation has been noted to occur in 49% of patients at 10 years following repair of the initial popliteal aneurysm. These aneurysms may develop in the aortic, femoral, or popliteal vessels. One third of patients present with symptoms, and major adverse events, including fatal rupture, have been noted to occur in 19% of patients. Because of this, lifelong surveillance should be performed using ultrasonography. Once diagnosed, prompt repair should be undertaken to prevent further risk to life or limb. Unfortunately, despite these efforts, these patients have poor longevity with 5-year survival being as low as 34% owing mostly to cardiovascular events.

Conclusion

Rupture of a popliteal artery aneurysm is a rare presentation for what is the most common of peripheral aneurysms. Symptomatic popliteal artery aneurysms should be repaired without delay to
prevent limb loss, which may be as high as 24%. Once repaired, these patients must be followed closely for life, for they are at continued risk of developing complications from new aneurysms at other sites.

REFERENCES


