

Popliteal Aneurysm. Clinical, Surgical and Ultrasound Approach

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Abstract

The term Popliteal aneurysm was coined as a cut perpendicular to the long axis of the vessel; greater than 15 mm or present loss of parallelism of the vessel walls with a diameter that exceeds 1.5 times the expected normal diameter. It is generally asymptomatic, and in a third of cases it can present as acute ischemia. A case of a 73-year-old male patient, panvascular and diabetic, without adherence to antihypertensive and hypoglycemic treatments, who presented a right popliteal aneurysm of several months of evolution, which began with sudden pain at rest in the lower limb, is developed right, at the infrapatellar level, associated with pallor and coldness, with the absence of infrapatellar pulses. Doppler ultrasound of the lower limb shows a 65-mm popliteal aneurysm with mural thrombi. In the surgical intervention, repair of the aneurysm is performed, femoro-popliteal bypass with PTFE prosthesis.

Keywords: Popliteal Aneurysm; Ecodoppler; By-Pass

Case Report

The vascular Doppler ultrasound study always begins with the two-dimensional image of the vessel. This should be analyzed in both cross-sectional and longitudinal views throughout the entire structure. The two-dimensional image allows the anatomical location of the vessel and its relationship with the surrounding structures; the distinction between artery and vein; the evaluation of thrombosis by means of compression/decompression maneuvers; and the morphological characterization of the vessel and its wall. For the evaluation of lower limb aneurysms, the study should include all the arterial segments of the limb in search of aneurysmal dilations. The maximum diameter in the aneurysmal segment will be measured from external edge to external edge, preferably in an anteroposterior direction or in a cut perpendicular to the long axis of the vessel; it must be >15 mm or have loss of parallelism of the vessel

walls with a diameter that exceeds 1.5 times the normal expected diameter. The points that the US exploration will include are the maximum diameter measured, the shape of the aneurysm, its longitudinal extension, the tortuosity of the vessel, the presence of plaques and their characteristics, and the presence of mural thrombosis inside the aneurysm, recording the characteristics of this (location, echogenicity and implantation base) [1-3].

Popliteal artery aneurysm is generally asymptomatic, and in a third of cases it can present as acute ischemia. Some patients present as a symptom the presence of intermittent claudication caused by repeated microembolisms or associated atherosclerotic disease. It can also manifest as popliteal pain and sometimes with pain and edema as a result of venous thrombosis due to compression of the popliteal vein. The rupture of these aneurysms is unusual, therefore their main danger is not rupture (less than 4 to 7%), but

the risk of thrombosis and distal ischemia in up to 33% of cases, a complication that carries mortality of 5% and an amputation rate of 20 to 40% [2]. Recently, other studies have documented that popliteal aneurysms carry a complication rate of 68 to 77% at five years, the majority occurring during the first two years, with an annual frequency of 14 to 24%. The Echo-Doppler is the best diagnostic and follow-up tool for this pathology. The dilation of the vessel accompanied or not by mural thrombus is visualized, it also allows us to evaluate the permeability and the state of the distal bed. It also helps us to make the differential diagnosis of other aetiologies such as complicated Baker's cyst [3].

The morbidity and mortality of patients who have not undergone surgery is high, especially due to the high risk of thrombosis (42%) and major amputation [4,5]. It was a

73-year-old male patient, pan vascular and diabetic, without adherence to antihypertensive and hypoglycemic treatments, who presented a right popliteal aneurysm of several months' evolution, which began with sudden symptoms of pain at rest in the right lower limb, at the infrapatellar level, associated with paleness and coldness, with the absence of infrapatellar pulses. Reason for which a Doppler ultrasound of the right lower limb is performed, which describes: Adequate tri- and biphasic spectrum in common femoral and superficial femoral arteries. The popliteal artery presents an aneurysm with mural thrombi in the true lumen of 15 mm AP. The aneurysm measures 65 mm longitudinal by 32 mm anteroposterior. Subsequently, a biphasic spectrum is observed with very low velocities in the tibialis anterior and tibialis posterior (Figure 1).

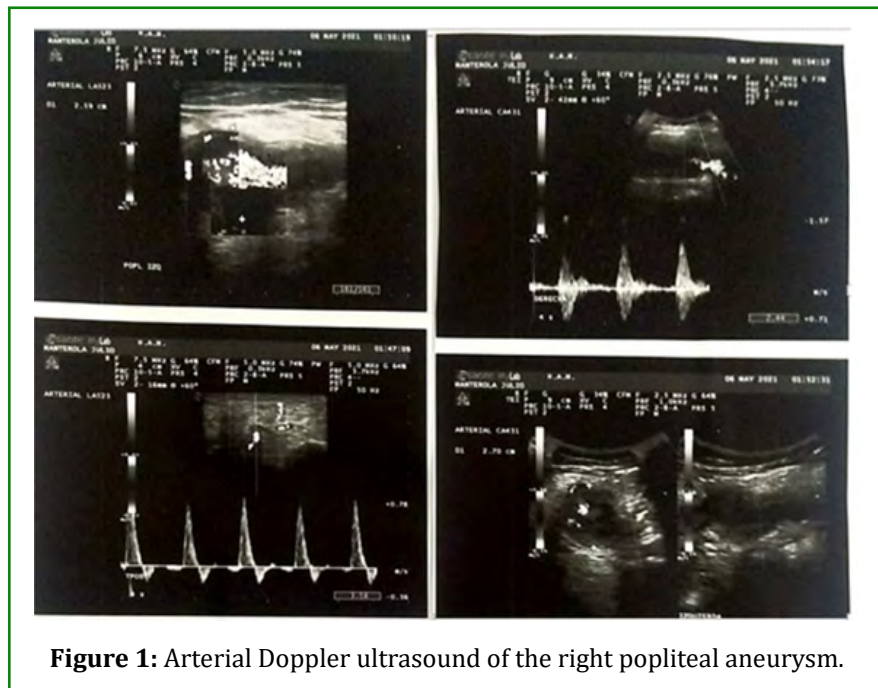


Figure 1: Arterial Doppler ultrasound of the right popliteal aneurysm.

Due to the previous symptomatology of the patient, the clinical history and the imaging study, it was interpreted as a complicated Right Popliteal Aneurysm and surgical intervention was performed, repairing the aneurysm, femoro-popliteal bypass with ringed PTFE prosthesis, confirming good distal flow, permeability and peripheral pulse (Figure 2).

On the third postoperative day, he was discharged from the hospital with preserved peripheral pulses, good mobility and nerve integrity of the lower limb, and the corresponding anti-aggregation. Continuing his follow-up by the Peripheral Vascular Surgery outpatient clinic. The diagnosis of popliteal aneurysm is multidisciplinary. Regarding treatment, Pappas et al describe a risk of amputation of 16% in those who are

not operated on. These data demonstrate the poor evolution of aneurysms and support the surgical indication in lesions of 2 or more cm in diameter [5]. The internal saphenous vein is of choice for revascularization, especially if there is a presence of distal occlusive disease that requires an anastomosis below the knee, popliteal involvement, infection or distal necrosis. However, Wisdom et al. advocate the use of prosthetic material such as Dacron or PTFE, since the diameter of the saphenous vein is generally inadequate and would only be justified in association with distal lesions, obtaining primary and secondary patency at 5 and 10 years of 84.7% and 88%.9%, respectively, with 100% limb salvage at 10 years. Due to the small number of patients, there are no randomized studies comparing the different surgical techniques [4].

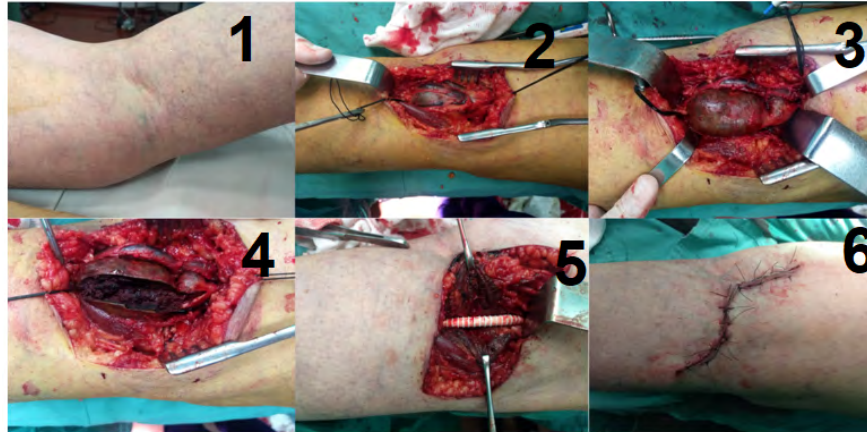


Figure 2: 1. Posterior view of the Popliteal aneurysm with the right knee flexed. 2. Incision and dissection of aneurysm. 3. Aneurysmal neck is seen on dissection. 4. Aneurysm opening. 5. Aneurysm repair with ringed PTFE prosthesis. 6. Wound closure.

References

1. Argentine Society of Cardiology (2020) Peripheral vascular disease consensus. *Rev Argent Cardiol* 88(4).
2. Reyna GAR, Castro JC, Bachmann RA, Wollenstein RW, Servin AC (2008) Popliteal artery aneurysms - Thirty years of experience at the ABC Medical Center. *Cir Cir* 76(1): 55-59.
3. Ventura C, Guido G (2013) *Vascular Ultrasonography*. 2nd (Edn.), Sao Paulo, Amolca.
4. Díaz DG, Yupanqui MG (2018) Giant femoro-popliteal aneurysm: case report. *Rev Hisp Health Science* 4(2).
5. Kawai Y, Morimae H, Matsushita M (2019) A Ruptured Popliteal Artery Aneurysm Treated with Coil Embolization. *Ann Vasc Dis* 12(1): 80-82.