Popliteal Artery Aneurysm

What is a Popliteal Artery Aneurysm?

Popliteal artery aneurysm (PAA) refers to an abnormal dilatation of the artery behind the knee that conveys blood from the leg to the foot. Although uncommon in the general population they are the second most common peripheral arterial aneurysm and are often associated with aneurysms elsewhere in the body including aortic and femoral artery aneurysms. The majority of PAAs occur in men over the age of 60 years and cause symptoms in 2/3rds of patients leading to the initial diagnosis.

What causes a Popliteal Artery Aneurysm?

The majority of PAAs develop secondary to atherosclerosis but may also occur as a result of trauma, infection or mechanical causes such as popliteal entrapment syndrome.

Why are Popliteal Artery Aneurysms important?

The most common complication of PAAs relates to their propensity to block the blood supply to the lower leg through clot formation (thrombosis) causing limb ischaemia. (See table 1) This may present as an emergency whereby the leg viability is threatened due to the sudden occlusion of the popliteal artery necessitating emergency treatment to prevent amputation. Alternatively, a more insidious presentation may occur with development of claudication (pain in the affected leg upon walking) that slowly progresses to severe limb ischaemia with leg pain at rest with or without skin ulceration. Large PPAs may compress neighbouring structures behind the knee including the popliteal vein leading to leg swelling and skin discolouration below the knee. Very rarely the PAA may rupture threatening the patient's life as well as the leg due to sudden blood loss.

Symptomatic	67%
Limb ischaemia	55%
Local Compression	9%
leg swelling	
Skin staining	
Ulceration	
Pins & Needles	
Numbness in foot	
DVT	
Rupture	3%
Incidental Finding	33%

Table 1: Presentation of popliteal artery aneurysm

What investigations should be performed for a Popliteal Artery Aneurysm?

If your surgeon suspects a PAA a number of imaging investigations will be organised aimed at providing information relating to a) the size and extent of the aneurysm, b) the patency of arteries above and below the popliteal artery, and c) the presence of a suitable vein to act as a bypass conduit should surgical repair be necessary. Information about the effect on neighbouring structures is also important for aneurysms producing compression related symptoms. Typically, a duplex Doppler ultrasound scan (jelly scan) will be performed initially to confirm the diagnosis and assess A-C. Occasionally a CT or MRI scan is required to further assess the anatomy of the aneurysm particularly if a minimally invasive method of repair (endovascular) is being considered.

When does a Popliteal Artery Aneurysm require treatment?

IAll patients with symptomatic aneurysms require intervention for the relief of symptoms and prevention of limb loss. Patients in who a PAA has been identified incidentally may still require intervention to prevent the aforementioned complications. In general, we advocate elective repair for all asymptomatic PAAs measuring greater than 2cm in maximum diameter particularly those which contain large volumes of thrombus (clot).

What are the treatments for Popliteal Artery Aneurysms?

There are two main techniques for repairing popliteal artery aneurysms: open surgery and endovascular stent insertion. The most widely utilised technique is open surgery treatment which aims to exclude the aneurysm from the circulation by ligating (tying off) the artery above and below the aneurysm whilst re-routing the blood flow around the aneurysm with a leg bypass. This can be performed either from behind the knee or (posterior approach) or from alongside the knee (medial approach). Alternatively, your surgeon may recommend endovascular repair which involves placing a stent-graft through the PAA thereby excluding it from the circulation. Only certain shapes and sizes of PAAs are suitable for endovascular repair and being a relatively new technique there is little long-term data relating to the long-term durability of stent-graft insertion. Your surgeon will discuss in length the merits of each technique based on your individual circumstances.