Leg Pains – Claudication and Critical Ischaemia.

Leg pains or pains on walking is a common complaint. Most arterial vascular causes are easy to distinguish in terms of causation but significant difficulty occurs when multiple disease processes coexist, for e.g. conditions such as trauma, arthritis, sciatica, restless leg syndrome and spinal stenosis. Atherosclerosis commonly affects the blood vessels of the leg causing stenosis or occlusion of these blood vessels leading to a restriction in blood flow. Claudication is defined as pain in a muscle group on exercise, as a result of this restriction in blood flow.

Normally muscle fibre nutrition depends on oxygen getting to the muscle, but in a situation of restricted blood flow (and the production of lactic acid and other metabolites), pain is a major feature. Claudication occurs when muscle function is restricted because of a build up of these metabolites. The distance that a patient can walk before developing pain in the legs is fairly constant, after a period or rest, the pain the goes away as the metabolites are washed away, and the patient can walk a similar distance before needing to stop again. This distance is called the "claudication distance", and because symptoms come and go at fairly regular intervals, the condition is also known as "intermittent claudication".

Typically in early disease the claudication distance is in the order of hundreds of metres, but as the disease progresses, the claudication distance becomes less and less, and when the nutrition reaching the nerves and muscles is inadequate for basal metabolic functions, the patient develops "rest pains", which is quite simply pain at rest. This is less pronounced during the day when the patient is upright and active, and blood flow is helped by gravity. The pain becomes prominent when the patient goes to bed at night and is woken up by leg pains which is relieved by dependency, hanging the leg out of the bed or sitting in a chair, or going to stand on a cool floor (as this decreases the metabolic requirement of the limb). The final stage is one of tissue loss as the nutritional supply is insufficient for cell viability and leads to cell death, ulceration or gangrene.

Assessment

In most cases a good history and clinical examination and ankle brachial pressure index (ABPI) of less than 0.9 will confirm a diagnosis of claudication or critical ischaemia.

The ABPI is the ratio of the Doppler pressure at the ankle compared to the arm blood pressure.

Treadmill Exercise testing, by measuring the ABPI before and after exercise, objectively uncovers occult vascular disease, and highlights other exercise limiting conditions such as angina, shortness of breath or arthritis.

A Duplex scan, Doppler combined with real time ultrasound, will more accurately delineate the site and extent of significant arterial stenosis or occlusion.

Arteriography is reserved for patients in whom revascularisation is contemplated.

Treatment

Claudication is a relatively benign condition, and any intervention must be carefully weighted against the potential risks and the possible benefits. Generally, patients with arterial disease have significant coexisting, cardiovascular, respiratory and renal problems. At least 70% of patients with claudication have some degree of ischaemic heart disease and their 10-year mortality, largely from myocardial infarction and stroke is approximately 50%, or almost four times greater than patients without peripheral arterial disease.3

The mainstay of treatment of claudication is therefore conservative, with attention to the diagnosis and treatment of risk factors and lifestyle modification in order to reduce the progression of atherosclerosis.

- All smokers should join a smoking cessation programme and stop smoking. Hypertension should be treated
- All patients should be screened for diabetes and hyperlipidaemia, and advised to have an active life with lots of exercise and weight loss.
- Specific drugs are of limited benefit, but an antiplatelet agent (aspirin or clopidogrel) is usually advised because this reduces the risk or cardiovascular and cerebrovascular events.
- Statin therapy is also advised for patients with vascular disease regardless of the initial cholesterol level, aiming for a reduction of 30% or less than 3.0 mmol/L of baseline LDL Cholesterol, or total serum cholesterol by 20-25% or less than 5.0 mmol/L.
- Intervention would then take the form of percutaneous transluminal angioplasty, sub-intimal angioplasty or bypass surgery. Endovascular interventions are now playing a greater role in limb salvage with increasingly promising results.

Critical Limb Ischaemia

Critical limb ischaemia has an incidence in the UK of 40/100 000 affecting about 20,000 patients each year, with an amputation rate approaching 25%.4 One year after developing critical limb ischaemia less than 50-60% will be alive with two legs, 20% will have died from cardiovascular or cerebrovascular disease, and up to 20% would have had an amputation. Critical ischaemia is therefore a marker of significant blood vessel disease in all territories. Most patients are assessed for intervention of one form or another, in order to improve quality of life. It is also cheaper to perform arterial reconstruction and limb salvage than major amputation.5

Aggressive risk factor management together with surgical reconstruction with or without endovascular intervention offers the best chance for limb salvage and quality of life, but up to 20% of patients will have end stage disease and not be amenable to any form of reconstruction. Revascularisation of aorto-iliac and femoro-popliteal occlusive disease is recommended for significant arterial disease and bypass surgery to the crural and pedal vessels can now be performed with relatively low morbidity and mortality, with improved results and quality of life compared to major amputation.