Management of arterial stenosis or occlusion

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General Only one-quarter of patients presenting with intermittent claudication will experience symptomatic deterioration during their lifetime and the overall risk of progression to CLTI and amputation is small, with <5% of patients requiring amputa tion over a 5-year period. Patients with an ABI of <0.50 are twice as likely to deteriorate as patients with an ABI of >0.50, and a deteriorating ABI is predictive of future limb loss. For patients with rest pain or tissue necrosis, intervention is usually required to prevent major amputation. Claudication is often a marker of silent coronary arterial disease whose extent correlates with the ABI: a decrease of 0.1 in ABI below 0.9 is associated with a 10% increase in the rela - tive risk of a major cardiovascular e vent. Similarly , one-quarter - of patients with claudication have significant atherosclerotic disease a ff ecting their carotid and renal arterial systems. It is thus not surprising tha t the risk of having a major cardiovascu - lar event per year in patients with claudication is >5%, and that - 50% of claudicants will die within 10 years from myocardial infarction or stroke. The common modifiable risk factors for PAD mirror those f or coronary artery disease: smoking, DM, - hypertension and hyperlipidaemia. Therefore, the two main aims when treating claudication are (i) prevention of major cardiovascular morbidity through risk factor modification and (ii) symptom relief/improvement. Non-surgical management For many patients with claudication a structured exercise programme of at least 2 hours of exercise per week for 3 months in combination with smoking cessation will lead to sustained improvement in claudication distance and a reduc - tion in cardiovascular risk. DM increases the risk and severity of claudication proportional to the duration of a ffl iction. Strict control in combination with weight loss in obese patients is vital to reduce cardiovascular risk and prevent symptom deterioration. Drugs - Medication may be required for diseases associated with arterial disorders, such as hypertension and diabetes; some

Figure 61.13 Magnetic resonance angiogram showing a tight stenosis at the midpoint of the left common iliac artery.

claudication. Raised blood lipids require active drug treat ment, but even when the lipid profile is normal a statin (3-hydroxy-3-methylglutaryl coenzyme A [HMG-CoA] reductase inhibitor) should be prescribed as it may stabilise atherosclerotic plaques and protect against cardiac death inde pendently of baseline serum lipid levels. An antiplatelet agent is also necessary: global guidelines recommend 75 /uni00A0 mg per day of clopidogrel or 75 /uni00A0 mg per day of aspirin as an alternative. Other agents, such as vasodilators, are unlikely to provide either significant or sustained benefit. Drugs are now available to help with smoking cessation. Transluminal angioplasty and stenting Arterial occlusive disease may be treated by inserting a balloon catheter

into an artery and inflating it within a stenosed or occluded segment (Figures 61.14 and 61.15). This technique is suitable for patients with claudication, rest pain or tissue - - necrosis (Figures 61.16 and 61.17). Following percutaneous femoral artery puncture under local anaesthetic a guidewire is inserted and negotiated through the stenosis or occlusion under fluoroscopic control. A balloon catheter is positioned within the lesion over the guidewire and inflated at high pressure for approximately 30 seconds. Satisfactory dilatation of the lesion is confirmed by performing an angiogram. Percutaneous transluminal angioplasty (PTA) has proved very successful in dilating the iliac and femoropopliteal segments; the results below the knee are less successful but improving. Long occlusions may be treated by the technique of subintimal angioplasty , in which the guidewire crosses the lesion in the subintimal space (in the arterial wall) and a new lumen is created by inflation of the balloon. Complications occur in about 5% of cases and include failure, haematoma, bleeding, thrombosis and distal embolisation; these may impact on the surgeon’s ability to perform a subsequent open surgical revascularisation procedure. If the vessel fails to stay adequately dilated (often caused by elastic recoil of the artery), it may be possible to hold the lumen open using a metallic stent (Figures 61.18 and 61.19). This may be introduced on a balloon catheter and expanded

Figure 61.14 Balloon catheter for percutaneous transluminal angio plasty. (a) (b) Figure 61.15 (a) Catheter balloon de /f_l ated; (b) balloon in /f_l ated. Figure 61.16 (a) Digital subtraction angiogram (DSA) demonstrat

ing multiple stenoses within the super /f_i cial femoral artery (SFA).

/uni00A0 (b) Balloon angioplasty of the SFA. (c) Postangioplasty DSA of the SFA demonstrating improvement in the previously stenotic regions. This technique can be carried out under local anaesthesia using the Seldinger technique of percutaneous arterial puncture. It is therefore especially useful in the treatment of patients who are medically un /f_i t for major bypass surgery.

by balloon inflation. Alternatively , a self-expanding (typically nitinol) stent may be used; this is contained inside a plastic sheath and deployed by withdrawal of the sheath.

Figure 61.17 Before (a) and after (b) balloon dilatation of a severely stenosed left renal artery in a 20-year-old woman with uncontrollable hypertension. The patient’s blood pressure fell to normal after the procedure. The stenosis was probably due to /f_i bromuscular hyperplasia, but no tissue was available for histological diagnosis. (a) (b) Figure 61.18 (a) A balloon catheter carrying a stent; (b) the expanded stent.

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