Commentary on the 2024 European Society of Cardiology Guidelines on Peripheral Arterial and Aortic Diseases

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The 2024 European Society of Cardiology (ESC) guidelines offer guidance on diagnosis, surveillance, and treatment for peripheral arterial and aortic diseases (PAAD).[1] They underscore the importance of adopting a shared decision-making approach between patients and physicians, as well as a multidisciplinary approach in specialised, high-volume PAAD centres that manage complex patients or procedures. The guidelines also highlight the need for a comprehensive evaluation of the entire arterial circulation in patients with PAAD (grading of recommendations I, class of evidence B).

With respect to peripheral arterial disease (PAD; where the term PAD refers to lower-extremity atherosclerotic arterial disease), a non-invasive approach is recommended for the initial screening based on the use of the ankle-brachial index (ABI) as first test (I/B). An ABI ≤0.9 is considered a diagnostic criterion for PAD. Nevertheless, ABI ≥1.4 is often found among patients with diabetes and/or chronic kidney disease owing to the presence of vessel medial calcification, which may be misleading when ruling out the presence of PAD. Therefore, among these subgroups of patients the use of alternative indexes and techniques such as toe pressure, the toe-brachial index or Doppler waveform analysis is recommended (I/B).[1]

A clinical classification of PAD into three main groups has been introduced in these guidelines: asymptomatic PAD (usually identified by screening); symptomatic PAD (effort-related); and chronic limb-threatening ischaemia, the latter including patients with ischaemic pain at rest.

A multi-targeted therapeutic approach including non-pharmacological interventions, such as lifestyle changes, implementation of healthy diet and physical activity including supervised hospital- or structured home-based exercise training programmes, as well as pharmacological interventions including lipid-lowering medications and/or antiplatelet and antithrombotic drugs is recommended. With respect to pharmacological interventions, the 2024 ESC guidelines recommend single antiplatelet therapy with aspirin or clopidogrel in patients with symptomatic PAD (I/A), and a dual antithrombotic regimen with low-dose rivaroxaban and aspirin in patients with PAD at high ischaemic risk and low bleeding risk (IIa/A). Anti-hypertensive medications are recommended for the treatment of systemic hypertension as well.

With respect to aortic diseases, the 2024 ESC guidelines have introduced new concepts in the management of ascending aorta dilatations such as: the inclusion of multiple parameters beyond aortic diameter as an indication for surgery; the importance of evaluating the trade-off between the risk of adverse aortic events and the surgical risk; and the homogeneity of indications to surgery for both tricuspid and bicuspid aortic valves, albeit with different levels of recommendation.

High-risk features for thoracoabdominal aortic aneurysm rupture for the tricuspid aortic valve include uncontrolled resistant hypertension, the annual rate of aortic diameter growth, an aortic length >11 mm, the indexed aortic diameter according to the patient's height and the aortic phenotype: root, e.g. aortic dilation with sinus diameter > tubular diameter versus ascending aortic dilation. For both the tricuspid and bicuspid aortic valves, surgery is indicated when maximum aortic diameter is ≥55 mm (I/B). For bicuspid valves, surgery is indicated for the root phenotype if maximum aortic diameter is ≥50 mm (I/B). In patients with low surgical risk (e.g. <3%), surgical treatment can be considered for ascending aorta dilation >52 mm in the tricuspid aortic valve (IIa/B).

With respect to acute aortic syndromes, the 2024 ESC guidelines have introduced a new classification: TEM, where T stands for the type of aortic syndrome, E for the localisation of the entry tear, and M for the presence of malperfusion, which carries prognostic and therapeutic implications.

A multiparametric diagnostic algorithm using the aortic dissection detection risk score is recommended (I/B). This includes assessing high-risk conditions, high-risk pain features, and high-risk examination features. Early implementation of ECG-gated contrast CT from neck to

pelvis is advised as the first-line imaging technique (I/C). Additionally, trans-oesophageal echocardiogram is recommended to guide perioperative management and detect early complications (I/C). For complicated type B acute aortic dissection with favourable thoracic endovascular aortic repair anatomy, endovascular repair is recommended (I/B), with open surgery as an alternative option (I/B). For uncomplicated type B acute aortic dissection with favourable thoracic endovascular aortic repair anatomy, endovascular repair in the subacute phase is recommended (IIa/B).

From a cardiovascular perspective, the presence of PAD or aortic disease deserves particular attention. Patients with PAD are at high risk for major adverse limb events, including lower limb revascularisation and amputation, which ultimately increase the risk of death.[2] PAD is also associated with significant carotid artery disease and a higher risk of major adverse cardiovascular events.[3–5] Therefore, the therapeutic goals for PAD include improving quality of life in symptomatic patients, reducing the risk of major adverse limb events, and lowering overall cardiovascular and cerebrovascular risk.

Abdominal aortic aneurysms are associated with a high cardiovascular risk burden similar to that of polyvascular disease, leading to excess mortality in these patients.[6,7] Prior studies have shown that isolated thoracic aortic aneurysms tend to have a lower cardiovascular risk profile compared with abdominal aortic aneurysms.[8] A recent community-based cohort study of elderly patients without prior stroke found that large atherosclerotic plaques (≥4 mm thick) in the aortic arch were independently associated with a composite outcome of ischaemic stroke, myocardial infarction, and cardiovascular death (adjusted HR 2.19; 95% CI [1.40–3.43]), but not with stroke alone. This finding suggests that aortic arch plaques may be a marker of cardiovascular risk rather than a direct source of embolic stroke.[9]

The 2024 ESC guidelines have introduced a new recommendation for initiating statin treatment or single antiplatelet therapy with clopidogrel or low-dose aspirin among patients with severe/complex aortic atheromatous plaques (IIa/C).

Given the high cardiovascular risk of most patients with PAAD, screening for obstructive coronary artery disease (CAD) plays a crucial role in optimising medical therapy and planning tailored revascularisation strategies.[10]

The use of coronary CT for the identification of obstructive CAD is highly accurate in most patients at high cardiovascular risk, and represents a quick, cost-effective strategy in achieving a final diagnosis. The implementation of coronary CT is simple from an organisational perspective, as the majority of these patients are already undergoing chest and abdomen contrast CT as part of the diagnostic pathway for PAAD.

For urgent surgical interventions, such as acute limb salvage, limb amputation or the treatment of acute aortic disease, screening for CAD is necessarily deferred; however, a high alert for periprocedural cardiovascular complications is needed. For elective open surgical interventions, which tend to carry a higher risk of periprocedural cardiovascular complications compared with elective endovascular interventions, screening for CAD prior to surgical intervention is highly desirable in patients with unknown obstructive CAD. Therefore, a shared decision-making process involving the patient as well as PAAD specialists, cardiologists, interventional cardiologists and cardiac surgeons is warranted in cases of multivessel and/or complex disease. This approach will help define a tailored therapeutic approach regarding the timing and modes of interventions for obstructive CAD and PAAD. The ultimate goal is to improve global patient outcome and quality of life, addressing the most clinically relevant diseases in a timely and effective manner. ❑

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