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Opinion Article

Diagnostic Strategies for Iliac Artery Stenosis in Hyperlipidemic Patients

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DESCRIPTION

Iliac artery stenosis is a significant manifestation of peripheral arterial disease and is commonly associated with hyperlipidemia, a metabolic disorder characterized by elevated levels of cholesterol and triglycerides in the blood. Hyperlipidemia accelerates atherosclerotic plaque formation within large and medium-sized arteries, including the iliac arteries, which supply blood to the pelvis and lower extremities. Progressive narrowing of these vessels can lead to reduced blood flow, resulting in functional limitations and increased cardiovascular risk. Accurate and timely diagnosis of iliac artery stenosis in hyperlipidemic patients is essential for preventing complications such as chronic limb ischemia, impaired mobility and reduced quality of life.

Hyperlipidemia contributes to iliac artery stenosis primarily through endothelial dysfunction and lipid accumulation within the arterial wall. Elevated low-density lipoprotein cholesterol infiltrates the endothelium, triggering inflammatory responses and plaque development. Over time, these plaques enlarge and harden, causing luminal narrowing and reduced arterial compliance. Because this process is often gradual, many hyperlipidemic patients may remain asymptomatic in the early stages. As a result, diagnosis frequently depends on a combination of clinical evaluation and imaging techniques rather than symptoms alone. Early identification is particularly important in hyperlipidemic individuals, as they often have coexisting risk factors such as hypertension, diabetes mellitus, obesity and smoking history.

Clinical assessment is the first step in diagnosing iliac artery stenosis. A detailed medical history helps identify risk factors and symptom patterns suggestive of peripheral arterial disease. Patients may report intermittent claudication, which presents as pain or cramping in the hips, thighs, or buttocks during walking that resolves with rest. In more advanced cases, symptoms may include rest pain, coldness of the lower limbs, or delayed wound healing. Physical examination may reveal diminished or absent femoral pulses, bruits over the iliac region, or signs of reduced perfusion in the lower extremities. Although clinical findings raise suspicion, they are not sufficient alone to confirm the diagnosis, especially in early or mild disease.

Noninvasive diagnostic tests play a major role in evaluating suspected iliac artery stenosis in hyperlipidemic patients. The ankle-brachial index is a simple and widely used screening tool that compares blood pressure in the ankle with that in the arm. A reduced ankle-brachial index suggests peripheral arterial disease and warrants further investigation. However, because iliac artery stenosis may sometimes produce normal ankle-brachial index values at rest, especially in early disease, exercise testing can improve diagnostic accuracy by revealing pressure drops during physical activity. Doppler ultrasound is another valuable noninvasive modality that provides information about blood flow velocity and waveform patterns, helping identify areas of arterial narrowing.

Advanced imaging techniques are often required for definitive diagnosis and treatment planning. Computed tomography angiography offers high-resolution images of the iliac arteries and can accurately assess the location, extent and severity of stenosis. It is particularly useful for visualizing calcified plaques commonly seen in hyperlipidemic patients. Magnetic resonance angiography is an alternative imaging option that avoids ionizing radiation and provides detailed vascular images, making it suitable for patients with contraindications to contrast agents used in computed tomography. These imaging modalities allow clinicians to evaluate both anatomical and functional aspects of iliac artery disease.

Invasive diagnostic procedures, such as digital subtraction angiography, are considered the gold standard for diagnosing iliac artery stenosis but are typically reserved for cases where intervention is planned. This technique provides precise visualization of arterial anatomy and blood flow dynamics, enabling accurate measurement of stenosis severity. Although invasive, it allows simultaneous therapeutic procedures such as angioplasty or stent placement if significant narrowing is identified. In hyperlipidemic patients with severe or progressive symptoms, angiography plays a critical role in guiding management decisions.

Laboratory evaluation supports the diagnostic process by confirming hyperlipidemia and assessing overall cardiovascular risk. Lipid profile testing, including total cholesterol, low-density lipoprotein cholesterol, high-density lipoprotein cholesterol and

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triglycerides, helps establish the metabolic contribution to arterial disease. Identifying uncontrolled lipid abnormalities reinforces the need for aggressive risk factor modification alongside vascular assessment. Combining laboratory data with imaging and clinical findings provides a comprehensive approach to diagnosis.

CONCLUSION

In conclusion, the diagnosis of iliac artery stenosis in hyperlipidemic patients requires a systematic approach that integrates clinical evaluation, noninvasive testing, advanced imaging and laboratory assessment. Because hyperlipidemia promotes silent progression of atherosclerosis, early and accurate diagnosis is vital to prevent severe vascular complications. Timely identification of iliac artery stenosis allows for appropriate medical management, lifestyle modification and interventional treatment when necessary, ultimately improving vascular outcomes and reducing long-term cardiovascular risk.