

Comprehensive Assessment of Endarterectomy for Stroke Prevention and Vascular Health

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DESCRIPTION

Endarterectomy is a surgical procedure designed to remove atherosclerotic plaque or other obstructions from the inner lining of arteries, restoring normal blood flow and reducing the risk of severe cardiovascular events. One of the most significant applications of this procedure is in stroke prevention, particularly through carotid endarterectomy, which targets narrowing of the carotid arteries in the neck. The carotid arteries are major vessels supplying blood to the brain and significant narrowing due to atherosclerosis can lead to Transient Ischemic Attacks (TIAs) or full-blown strokes. By removing the plaque and restoring proper blood flow, endarterectomy plays a crucial role in protecting patients from potentially debilitating or fatal cerebrovascular events. Beyond stroke prevention, endarterectomy also contributes to overall cardiovascular health by improving arterial circulation, alleviating symptoms of peripheral arterial disease and reducing the strain on the heart caused by obstructed blood flow.

The procedure is typically indicated for patients with significant arterial stenosis, especially those who are symptomatic, meaning they have experienced TIA, minor stroke, or other signs of cerebral ischemia. Preoperative assessment is critical and involves imaging studies such as duplex ultrasonography, Computed Tomography Angiography (CTA), or Magnetic Resonance Angiography (MRA) to determine the degree and location of arterial narrowing. Patients are also evaluated for overall cardiovascular risk, comorbid conditions and suitability for anesthesia. Careful patient selection ensures that the benefits of endarterectomy outweigh the potential risks and complications.

The surgical technique involves exposing the affected artery, clamping blood flow temporarily and performing an arteriotomy to access the inner lining of the vessel. Using specialized instruments, the surgeon carefully removes the atherosclerotic plaque while minimizing trauma to the artery wall. In many cases, a patch angioplasty is performed to widen the artery and prevent restenosis, improving long-term blood flow. During the procedure, temporary shunts may be employed to maintain cerebral perfusion, particularly in carotid endarterectomy and

intraoperative monitoring, such as electroencephalography (EEG) or cerebral oximetry, is used to ensure that the brain receives sufficient blood supply. Meticulous surgical technique and careful handling of the artery are essential to minimize risks such as embolism, bleeding, or nerve injury.

Postoperative management is a critical component of ensuring the procedure's success and long-term cardiovascular benefits. Patients typically receive antiplatelet or anticoagulant therapy to reduce the risk of new clot formation. Blood pressure and lipid management, as well as lifestyle modifications such as smoking cessation, healthy diet and regular exercise, are emphasized to prevent recurrence of atherosclerosis. Follow-up imaging is often conducted to monitor for restenosis and early detection of narrowing allows timely intervention before serious complications arise.

Endarterectomy has been shown to provide significant protective effects against stroke. Clinical trials and long-term studies indicate that in patients with symptomatic carotid artery stenosis, endarterectomy reduces the risk of recurrent stroke by a substantial margin compared to medical management alone. Even in selected asymptomatic patients with high-grade stenosis, the procedure can provide preventive benefits, although careful risk-benefit analysis is necessary. Beyond stroke prevention, improving blood flow through endarterectomy enhances overall cardiovascular function. Patients may experience relief from symptoms of peripheral arterial disease, such as leg pain and claudication and reduced cardiac workload due to improved systemic circulation.

While endarterectomy is highly effective, it is not without risks. Complications may include perioperative stroke, bleeding, hematoma formation, nerve injury, infection, or restenosis. Proper patient selection, surgical expertise and comprehensive postoperative care are essential to minimize these risks. Advances in surgical techniques, including minimally invasive approaches and hybrid procedures combining endarterectomy with endovascular interventions, have further improved safety and recovery times.

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CONCLUSION

In conclusion, endarterectomy is a vital surgical intervention for stroke prevention and the maintenance of cardiovascular health. By removing arterial blockages and restoring proper blood flow, it significantly reduces the risk of stroke, improves circulation, alleviates symptoms of peripheral arterial disease and enhances

overall heart and vascular function. Careful patient assessment, meticulous surgical technique and thorough postoperative management are crucial for maximizing the benefits and minimizing complications. For patients at high risk of cerebrovascular and cardiovascular events, endarterectomy represents a reliable and effective strategy to protect brain health and support long-term cardiovascular wellness.