

Intracranial Large Artery Atherosclerosis and its Impact on Stroke Location and Outcomes

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DESCRIPTION

Stroke is a significant cause of death and disability worldwide. Intracranial Large Artery Atherosclerotic Steno (ICAS) occlusive disease is a leading cause of ischemic stroke. It is associated with a high risk of recurrent stroke and poor clinical outcomes.

The location of the stenosis, whether in the anterior or posterior circulation, may influence the presentation, underlying risk factors, and clinical outcomes of ICAS-related stroke. This article explores about the available literature on the differences in risk factors, infarct patterns, and outcomes between anterior and posterior circulation strokes attributed to ICAS.

Epidemiology

ICAS is responsible for up to 10% of ischemic strokes worldwide. The incidence of ICAS-related stroke varies between populations and is highest in Asian countries, particularly in China and Korea. ICAS-related stroke is more common in men and in older individuals, and is associated with a higher prevalence of hypertension, diabetes, and dyslipidemia.

Risk factors

The risk factors for ICAS-related stroke differ according to the location of the stenosis. Anterior circulation strokes attributed to ICAS are associated with a higher prevalence of hypertension, diabetes, and smoking, while posterior circulation strokes are associated with a higher prevalence of hyperlipidemia and atrial fibrillation. The reasons for these differences are not well understood but may be related to differences in the anatomy and hemodynamics of the cerebral circulation.

Infarct patterns

The location of the ICAS-related stenosis influences the patterns of cerebral infarction. Anterior circulation strokes are more likely to involve the Middle Cerebral Artery (MCA) and present with hemiparesis and/or sensory deficits, aphasia or neglect. Posterior circulation strokes are more likely to involve the

vertebrobasilar artery and present with vertigo, diplopia, dysarthria, dysphagia, ataxia, or decreased level of consciousness. Lacunar infarctions, which result from small vessel disease, are more common in patients with ICAS in the anterior circulation.

Diagnostic evaluation

The diagnostic evaluation of ICAS-related stroke includes imaging studies such as Computed Tomography (CT) or Magnetic Resonance Imaging (MRI) of the brain, as well as vascular imaging of the intracranial arteries. Digital Subtraction Angiography (DSA) is considered the gold standard for the evaluation of intracranial steno-occlusive disease, but it is an invasive and time-consuming procedure. Noninvasive imaging modalities such as Computed Tomography Angiography (CTA), Magnetic Resonance Angiography (MRA), and Transcranial Doppler (TCD) have high sensitivity and specificity for the diagnosis of ICAS.

Treatment

The optimal treatment of ICAS-related stroke remains uncertain, and the management strategies are largely based on expert opinion and retrospective observational studies. The use of antithrombotic agents such as aspirin and clopidogrel is recommended in patients with ICAS-related stroke, and the addition of cilostazol or warfarin may be considered in selected patients. Angioplasty and stenting may be considered in patients with severe symptomatic stenosis, particularly those with recurrent ischemic events despite medical therapy. However, the benefits and risks of endovascular intervention for ICAS remain unclear, and large randomized controlled trials are needed to establish the optimal management strategy for this condition.

Prognosis

ICAS-related stroke is associated with a high risk of recurrent stroke and poor clinical outcomes, particularly in patients with symptomatic stenosis. The prognosis of ICAS-related stroke is influenced by the location of the stenosis, with posterior circulation strokes having a worse prognosis than anterior

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circulation strokes. The prognosis of ICAS-related stroke can vary depending on the severity of the stroke, the extent of the damage to the brain, and the location of the stroke. In general, ICAS-related stroke can have a poorer prognosis compared to strokes caused by other factors, such as blood clots or bleeding in the brain.

Studies have shown that ICAS-related stroke can have a higher rate of recurrent stroke and a higher risk of disability or death compared to other types of stroke. However, early diagnosis and treatment can improve the prognosis.

Treatment options for ICAS-related stroke may include medications to reduce the risk of blood clots, such as antiplatelet or anticoagulant drugs, as well as lifestyle changes to improve overall health, such as quitting smoking, maintaining a healthy weight, and exercising regularly. In some cases, surgical procedures, such as angioplasty or stenting, may be recommended to open up the narrowed artery and restore blood flow to the brain.

It's important to note that each case of ICAS-related stroke is unique, and the prognosis will depend on a variety of individual factors. It's important for individuals who have experienced an ICAS-related stroke to work closely with their healthcare team to develop a personalized treatment plan and to follow up regularly to monitor their condition.

CONCLUSION

Based on the available evidence, it can be concluded that anterior and posterior circulation strokes attributed to intracranial large artery atherosclerotic steno-occlusive disease exhibit significant differences in their risk factors, infarct patterns, and outcomes. Studies have consistently shown that posterior circulation strokes are associated with a higher prevalence of hypertension, diabetes, and smoking, while anterior circulation strokes are more commonly associated with dyslipidemia and coronary artery disease. Furthermore, there are significant differences in the distribution and severity of stenosis between anterior and posterior circulation strokes, with the former being more frequently affected by the internal carotid artery and the latter by the vertebrobasilar system.

Infarct patterns are also different, with posterior circulation strokes more commonly associated with large artery disease and anterior circulation strokes more commonly associated with small vessel disease. Regarding outcomes, posterior circulation strokes have been associated with a higher mortality rate, worse functional outcomes, and a higher risk of recurrent stroke compared to anterior circulation strokes. Therefore, it is important to consider these differences when diagnosing, treating, and managing patients with intracranial large artery atherosclerotic steno-occlusive disease.