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ENDOVASCULAR INTERVENTIONS IN CAROTID ARTERIES IN PATIENTS WITH CORONARY ARTERY DISEASE

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Abstract

Carotid artery stenosis is a major contributor to ischemic stroke and is commonly associated with coronary artery disease (CAD), particularly in the setting of multifocal atherosclerosis [1,2]. This study aimed to assess the safety and efficacy of carotid artery stenting (CAS) in patients with symptomatic and asymptomatic carotid stenosis and concomitant CAD. A total of 55 patients treated between 2021 and 2024 were included. The mean age was 65.5 ± 4.5 years, and the degree of internal carotid artery stenosis ranged from 40% to 99%. Most patients had significant comorbidities, including arterial hypertension (76.3%), diabetes mellitus (41.8%), and a history of myocardial infarction (30.9%). All patients received dual antiplatelet therapy prior to intervention. A total of 57 CAS procedures were performed using self-expanding nitinol stents and embolic protection devices. The technical success rate was 100%, with effective restoration of vessel patency in all cases. Pre-dilatation was required in patients with critical stenosis. No major neurological complications, myocardial infarctions, or in-hospital mortality were observed. Transient neurological deficits occurred in 12.7% of patients, with

complete recovery during hospitalization. Carotid artery stenting is a safe and effective minimally invasive method for stroke prevention in patients with CAD and carotid artery disease. It may serve as a viable alternative to surgical treatment, particularly in high-risk patients with multifocal atherosclerosis [3].

Keywords: carotid artery stenosis; carotid artery stenting; coronary artery disease; multifocal atherosclerosis; endovascular treatment; embolic protection devices; ischemic stroke

Background

Carotid artery stenosis is a major cause of ischemic stroke and is frequently observed in patients with coronary artery disease (CAD) [1]. The presence of multifocal atherosclerosis significantly increases the risk of cerebrovascular complications [2]. Carotid endarterectomy has traditionally been considered the gold standard; however, endovascular techniques are increasingly used due to their minimally invasive nature and favorable outcomes [3]. Carotid artery stenting (CAS) provides effective revascularization in patients with hemodynamically significant stenosis [4].

Objective

To evaluate the clinical outcomes of carotid artery stenting in patients with symptomatic and asymptomatic carotid stenosis associated with coronary artery disease.

Materials and Methods

This study included 55 patients who underwent carotid artery stenting between 2021 and 2024. The mean age of patients was 65.5 ± 4.5 years (range 57–78 years). The

degree of internal carotid artery (ICA) stenosis ranged from 40% to 99% (mean 80 ± 10%). A history of stroke was reported in 13 patients (23.6%). The majority of patients had multiple comorbidities associated with multifocal atherosclerosis. Stable angina class III was observed in 38 patients (69.9%), while 17 patients (30.9%) had a history of myocardial infarction. Arterial hypertension was present in 42 patients (76.3%), and diabetes mellitus in 23 patients (41.8%). All patients received dual antiplatelet therapy 7 days prior to intervention, including aspirin (100 mg daily) combined with either clopidogrel (75 mg daily), prasugrel (10 mg daily), or ticagrelor (180 mg daily). A total of 57 carotid artery stenting procedures were performed. Self-expanding nitinol stents were used, including Protégé™ RX (45.4%) and Casper RX (52.6%). Embolic protection devices were applied in all cases: Spider FX (Medtronic) in 45.4%, Emboshield/EmPro (Terumo) in 49.1%, and Proender (Lepu Medical) in 5.5% of procedures.

Results

The overall technical success rate was 100%, with successful deployment of stents and restoration of adequate luminal diameter in all treated vessels. Pre-dilatation using coronary balloons (1.5–3.0 mm) was required in 6 patients due to critical (>95%) stenosis of the internal carotid artery. No major neurological complications were observed immediately after the procedures. There were no cases of myocardial infarction or in-hospital mortality. Minor cerebrovascular events with transient neurological deficits occurred in 7 patients (12.7%); however, complete neurological recovery was achieved during the hospital stay in all cases. The use of embolic protection devices in all procedures likely contributed to the absence of severe ischemic complications and favorable early outcomes [3,5].

Conclusion

Carotid artery stenting is a safe and effective minimally invasive approach for the prevention of ischemic stroke in patients with coronary artery disease and carotid artery stenosis.

This technique may be considered a viable alternative to conventional surgical treatment, particularly in patients with high surgical risk and multifocal atherosclerosis.

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