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Vascular

Intracranial arterial stenting for symptomatic stenoses: a Latin American experience

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Abstract

Background: The proportionally higher incidence of intracranial atherosclerosis among Asian and black patients and a greater proclivity for intracranial artery stenosis in the Hispanic population merit drawing attention to a Latin American experience with intracranial arterial stenting.

Methods: This is a retrospective analysis of an observational study of 33 intracranial lesions (each >50% stenosis) in 32 patients treated by intracranial angioplasty in 6 Latin American centers over a 3-year period. The investigation used a unique device, a balloon-expandable stent (Lekton Motion stent system, now Pharos, Biotronik, AG, Bülach, Switzerland).

Results: The treated patients ranged in age from 30 to 81 years (mean, 59.3 years; SD, 12 years), including 24 male and 8 female patients (sex ratio, 4:1). Two were Asians, 4 were blacks, and the rest were white Hispanic. Our mean follow-up is of 10.2 months (SD, 7.84 months), with a mortality rate of 9.4% (3/32), a nonfatal complication rate of 6.2%, and a stroke rate (rate of recurrence) of 0%. The mean pretreatment stenosis of 68.75% (SD, 14%) was reduced to a residual of 5.16% (SD, 16%) (P = .000; 95% confidence interval, 56.8%-70.3%). A control angiogram was performed in 82% of patients, and in that case, the restenosis 50% or greater was of 8.7% during the follow-up period.

Conclusion: The treatment of intracranial stenosis with the Lekton Motion stent (Pharos) is feasible with a high technical success rate. Restenosis as well as the rate of new neurologic events during follow-up suggests some efficacy of stroke prevention by using the latest-generation, highly trackable, balloon-expandable stents.

Keywords: Intracranial atherosclerosis; Intracranial stenosis; Stroke; Stenting; Atherosclerosis; Endovascular; Angioplasty

Abbreviations: ACT, activated clotting time; CTA, computed tomography angiography; DSA, digital substraction angiography; HDE, humanitarian device exemption; ICA, internal carotid artery; IU, international units; MCA, middle cerebral artery; SSYLVIA, stenting of symptomatic atherosclerotic lesions in the intracranial arteries; TIA, transient ischemic attack; WASID, warfarin-aspirin symptomatic intracranial disease trial.

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1. Introduction

Intracranial atherosclerotic lesions account for about 8% to 10% of all ischemic strokes [10,16]. Unlike extracranial carotid artery stenosis, intracranial atherosclerotic disease has been undetected in its diagnosis, undervalued in its prognosis, and disregarded in its treatment modalities.

WASID, the double-blinded randomized trial of warfarin and aspirin for symptomatic intracranial disease, had to be halted because of hemorrhage and major death rates of 8.3% and 9.7% in the warfarin group [3]. The overriding message of the latter, which was somewhat obscured by warfarin's more than 2-fold greater hazards, was that the composite primary end point of ischemic stroke, brain hemorrhage, or death from vascular causes other than stroke occurred in 21% to 22% in both study arms at a mean follow-up of 1.8 years [3]. In fact, more recent studies suggest that with best medical therapy, the rate of stroke ipsilateral to the stenosis is 11% in the first year, but it is nearly 2 times higher if the stenosis is 70% or greater [11]. On the other hand, surgical bypass treatment showed adverse events in 39% of the cases in one study [2] and in 30% of the cases in another one [7]. Considering the high rates of recurrence in spite of a well-conducted medical treatment, the endovascular options for symptomatic intracranial atherosclerosis have increasingly been adopted as another option in secondary prevention [8]. Balloon angioplasty also showed results with some adverse effects: in 14% of the cases, an arterial dissection occurred, 4% of the arteries ruptured, 2% had a hematoma, 4% had a TIA, and the mortality rate was 4% [4].

This therapeutic dilemma encouraged pursuit of intracranial angioplasty and stenting for patients with lesions auguring a high risk for stroke or death, including 2 prospective trials, with a 6-month 32% restenosis rate in one and 7% stroke rates in both [5,10]. Despite the obvious technical challenges and risks of arterial dissection and distal embolization, our own interest was particularly spurred by the proportionally higher incidence of intracranial lesions and greater proclivity for intracranial artery stenosis in the Hispanic population [17,20,27].

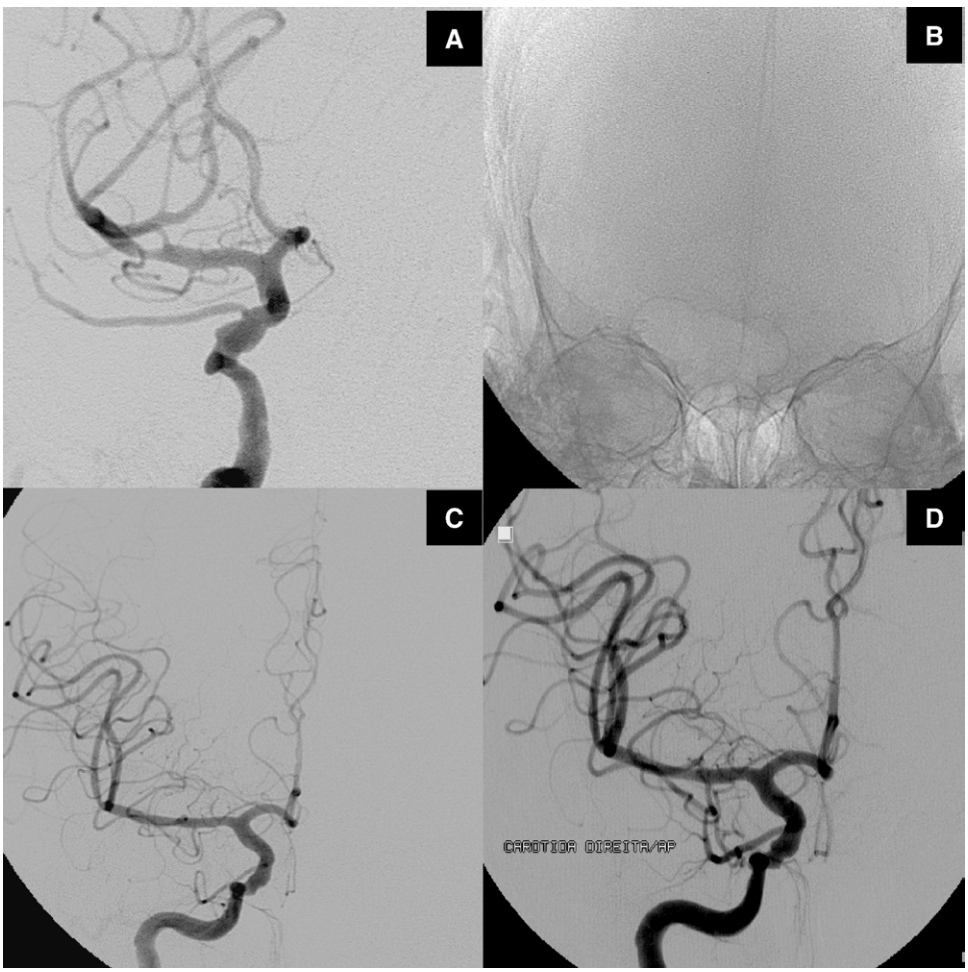

Fig. 1. A: Symptomatic stenosis of the MCA (Mori A). B: Stent in place (6F guiding catheter and 0.014″ microguidewire). C: Angiographic control at the end of the procedure. D: Angiographic control 14 months later (no intimal hyperplasia).