

# Case Report

## Multiple Retinal Emboli Following a New Carotid Stenting Procedure

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### Summary statement:

This report discusses the observation of multiple retinal emboli following placement of a new carotid stenting device. Especially dense plaques in the carotid artery can shatter into dust-like particles that may be fine enough to penetrate the filter of the new device, thus posing the danger of retinal perfusion.

**Key Words:** carotid stenting; retinal emboli

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### INTRODUCTION

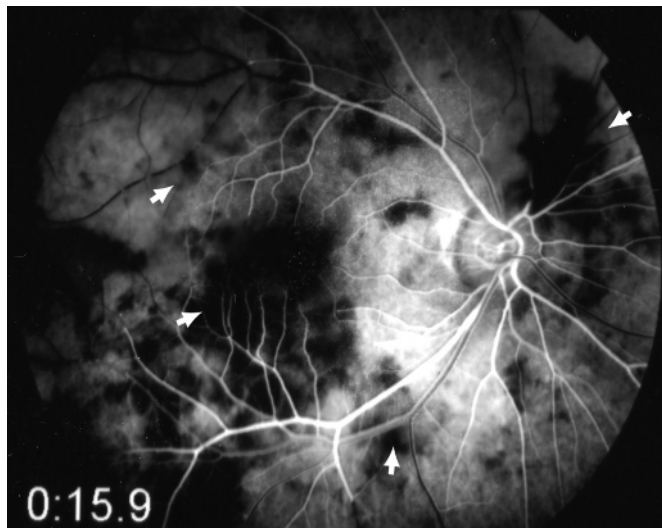
Carotid stenting is a relatively new procedure approved by the FDA for the treatment of severe carotid stenosis (> 70%) in high risk patients as an alternative to the traditional carotid endarterectomy. Cerebral embolization is one of the feared complications that can be prevented with the use of distal emboli protective devices. Both procedures have been shown to be equally safe in regard to death, stroke, or myocardial infarction as seen in the phase I CaRESS study (Carotid Revascularization Using Endarterectomy or Stenting Systems).<sup>1</sup>

### CASE REPORT

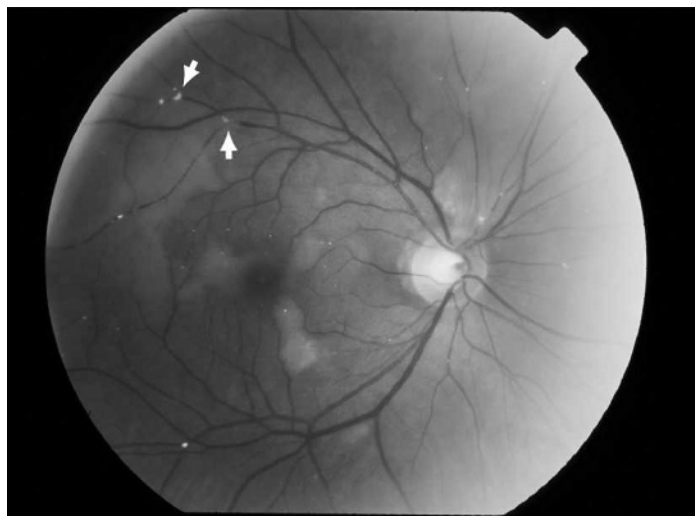
A 55-year-old patient with an asymptomatic 80% right internal carotid stenosis was diagnosed with a Doppler ultrasound after a notable carotid bruit during a routine assessment. A carotid endarterectomy was offered, but the patient opted for a percutaneous carotid revascularization because it is minimally invasive.

Following the carotid stent placement, the patient complained of reduced right visual acuity and a headache associated with a pressure sensation in the right eye. On initial ophthalmologic evaluation, his visual acuity was 20/40 OD, confrontational visual fields demonstrated paracentral scotomas, and fundoscopic examination and fluorescein angiography revealed multiple pale zones of edema and infarction (Figure 1).

**Figure 1. Fluorescein angiogram picture of patchy hypofluorescence**



**Figure 2. Fundus view of multiple emboli lodged in distal retinal arteries**



The fine dust-like particles noted in the infarcted zone were embolized from exceptionally dense and calcified atherosclerotic carotid plaques that must have shattered during angioplasty. The yellow non-refractile emboli were estimated to be lodged in small vessels of nearly 40 microns in diameter (Figure 2).

## DISCUSSION

Retinal vascular cholesterol emboli were first described by Hollenhorst in 1961, in a case series of 35 patients with preoperative retinal emboli undergoing endarterectomy.<sup>2</sup> In addition to ischemic retinopathy, progression of diabetic retinopathy and retinal macular degeneration, neovascularization and macular edema have been reported after carotid endarterectomies.<sup>3</sup> It has been postulated that carotid stent placement with distal emboli protection device can offer protective effect in diabetic patients.

This case illustrates a complication of a retinal embolization after carotid stenting because of fine dust-like particles from a shattered dense plaque passing through the pores of the distal embolic protective device. The device is designed to preserve adequate blood flow with intention to capture thrombi as small as 100 microns in diameter. Perhaps changing pore sizes could be a means to prevent microscopic embolization if it could be accomplished without compromising distal flow.

## REFERENCES

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