

Introduction

Carotid artery stenting (CAS) as compared to carotid endarterectomy (CEA) offers an alternate less invasive method for treatment of carotid artery stenosis and is currently being used to treat high-risk symptomatic patients. Randomized trials, industry sponsored trials, and personal series have documented the comparative short and intermediate-term results and complications of both procedures. However, few if any reports exist describing the incidence, clinical results or anatomic outcomes of patients who have suffered carotid stent fractures following CAS. There are trials underway to establish the role for CAS versus CEA in low-risk, asymptomatic patients. The durability of carotid stents is not known due to the limitations of the completed clinical trials and few reported studies showing long term follow up. The few studies to date have suggested that stent fracture is an unusual event and not associated with major adverse clinical events or in-stent restenosis.

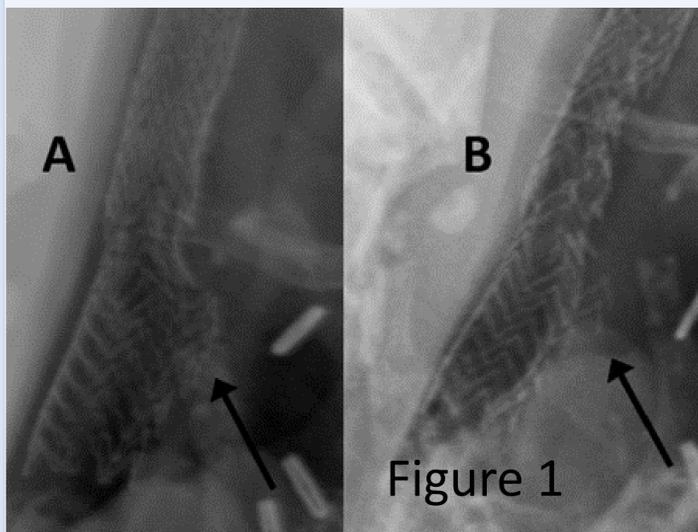
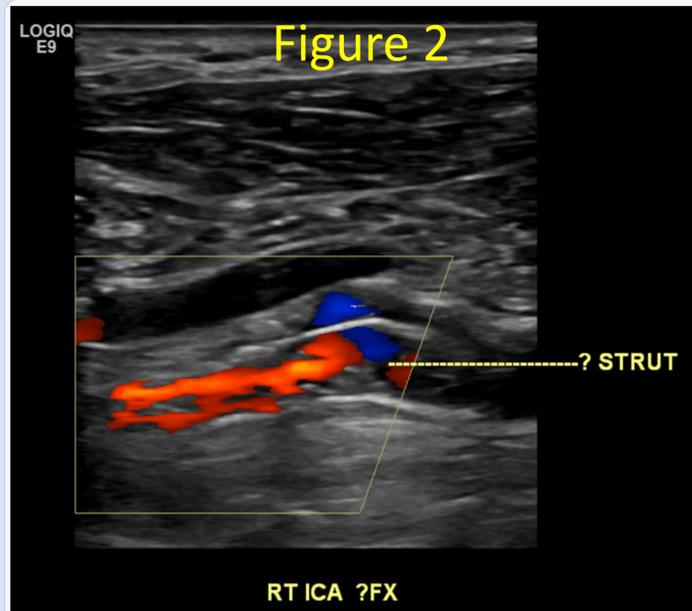


Figure 1

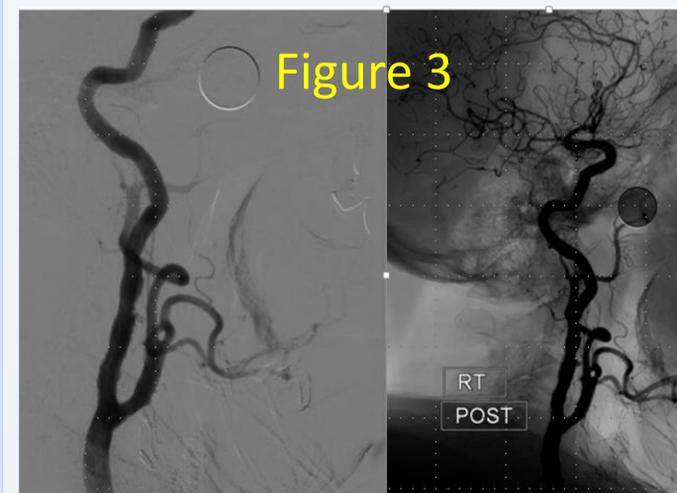


Case Presentation

A 70 year old male with multiple severe co-morbidities including coronary arterial disease, type 2 diabetes mellitus, 50 pack-year smoking history, alcohol abuse, morbid obesity and symptomatic peripheral arterial disease. He previously underwent a right carotid endarterectomy for asymptomatic 80-99% high grade internal carotid artery stenosis in 2005. Five years later during a routine clinical and noninvasive surveillance follow-up, carotid duplex scanning identified an asymptomatic high grade 80-99% (Fig 2) restenosis. He was enrolled in the *Choice Trial* for high surgical risk patients based on prior endarterectomy and his co-morbid conditions. Soon after enrollment, he underwent uneventful right carotid artery stent (Acculink). Under an IRB approved study evaluating for carotid stent fractures following his right carotid artery stent, his first post-operative X-ray, 3 months after stent placement, showed an early stent fracture (Fig 1.A,B). Despite the presence

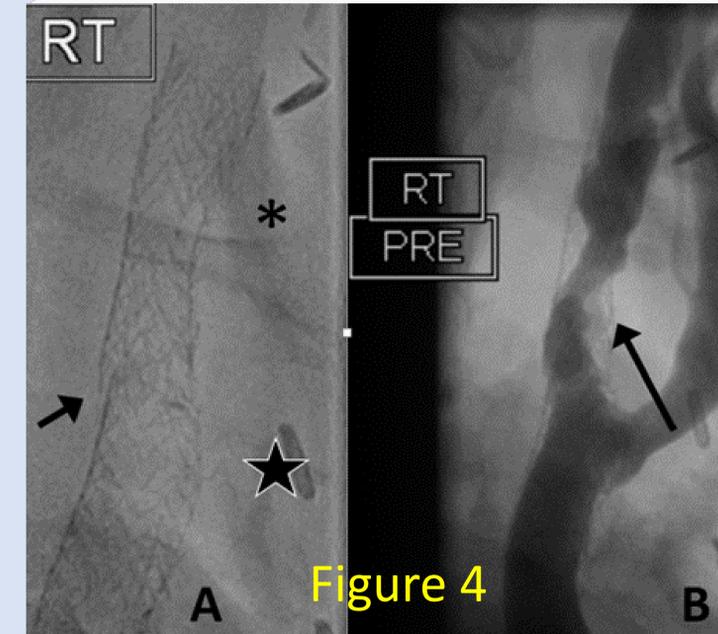
Case Presentation- continued

of the fracture and being monitored closely over the ensuing years, significant in-stent restenosis at the fracture site did not occur until late in follow-up, 9 years after stent placement. Therefore, a diagnostic aortic arch and carotid angiogram was performed to investigate the severity of the in-stent restenosis and determine if the carotid stent fracture was a causative factor (Fig 4 A,B). Angiography identified severe right carotid in-stent stenosis, which based on the proximity to the fracture, was most likely the result of the abnormal flow dynamics produced by the stent fracture (V-gap disruption). The patient underwent deployment of second right carotid stent in 2019 (Fig 3 A,B).



Discussion

Our case report describes the relatively benign natural history of a carotid stent fracture occurring early post-stent deployment. Despite the absence of clinical sequela related to the presence of a carotid stent fracture in our case, annual surveillance with duplex scanning provides the ability to



Discussion- continued

detect the presence of an associated in-stent stenosis, and, therefore, hopefully avoiding the development of potentially devastating neurologic sequelae. Given that most carotid stent patients are not evaluated for stent fractures and there is limited data on the long term durability and primary patency for carotid stenting, a more rigorous review of the long term durability and patency of carotid artery stenting is warranted

References

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