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Case Report

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Simultaneous stenting of the ipsilateral external and internal carotid arteries

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Abstract : Carotid artery diseases are diagnosed more frequently in practice due to increased mean life expectancy of the general population and the availability of imaging methods. Strong evidence coming from long term, randomized, large studies is required to support the idea that a carotid artery stent (CAS) may be an alternative to a carotid endarterectomy (CEA), which has been performed for long years with proven efficacy. Generally, no intervention (CEA or CAS) is performed in the stenosis of the external carotid artery (ECA) in the literature. In our case, we performed ipsilateral ECA and internal carotid artery stenting simultaneously.

Key words: External carotid artery stenting, proximal blocking system

1. Introduction

Although stroke is the third most common cause of death, it is the most frequent cause of morbidity. Approximately 80% of strokes are ischemic in nature (1). Recently, important advances have occurred in the treatment of carotid artery stenosis. These include new antiplatelet agents and developments in endovascular treatment. It has been shown that a carotid artery stent (CAS) by an experienced team may be an alternative to carotid endarterectomy (CEA) (2). In internal or common carotid artery stenosis, both CEA and CAS may be applied. However, intervention (CEA or CAS) usually cannot be performed in the stenosis of the external carotid artery (ECA). In these cases, patency of the ECA is crucial because of its collaterals. Here we report a CAS intervention applied first to the ECA and then stenosis extending from the internal carotid artery (ICA) to the common carotid artery.

2. Case report

A 77-year-old male patient had a stent inserted in his right ICA after a stroke in 2005. He also had hypertension, chronic obstructive lung disease, and a history of strokes. The patient was hospitalized in a neurology clinic in June 2010 due to hemiplegia on the right side of his body. He had a cardiology consultation to search for an embolic focus. There was no embolic focus in electrocardiography and echocardiography. Carotid Doppler ultrasonography (USG) was performed and showed 80% stenosis of the left ICA. There was no stenosis of the right carotid arteries found by the radiology department. We transferred the patient to the cardiology clinic for carotid angiography. Dual antiplatelet treatment consisting of acetylsalicylic acid (ASA) and clopidogrel was started and aggressive risk modification was performed. After obtaining informed consent of the patient, coronary angiography (CAG) and bilateral carotid angiography were performed. CAG revealed diffuse stenosis and 90% stenosis of the right coronary artery (RCA). Carotid angiography through a Judkins catheter via the right femoral way revealed that the stent in the right ICA was open. Additionally, there was 90% stenosis in the right ECA arising from the stent, and 90% stenosis in the left ICA. There was also 80% stenosis in the left ECA, according to the NASCET evaluation (Figure 1). We decided to perform a high risk operation for left carotid stenosis and percutaneous coronary intervention to the RCA. The patient and his relatives objected to the operation. We explained the risks of both interventions and obtained consent for the carotid procedure. Preoperatively, routine ASA+clopidogrel loading was carried out and the patient was transferred to a catheterization laboratory. After heparinization, a predilatation with 5.0 × 20 mm balloon was performed by passing it through a lesion in the ECA using a 0.014 mm guide wire. Following predilatation, a 5.0 × 40 mm Marisdeop self-expandable stent was implanted. After full openness was obtained in the ECA (Figure 2), a predilatation was performed on the

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Figure 1. Angiographic imaging of 90% stenosis in left ICA and 80% stenosis in left ECA. Left oblique cranial.

Figure 2. Angiographic image of the left ECA after stent and postdilatation. Left oblique cranial.

ICA by a 4.0 × 20 mm balloon using the MOMA (İnvatec) proximal blockage system that is used in ICA stents. A 6 × 9 × 40 mm self-expandable hybrid stent was then implanted and a postdilatation was performed with a 5.0 × 40 mm balloon (Figure 3). Due to bradycardia during the postdilatation period, atropine was administered. Before removing the proximal blockage system, embolic material aspiration was applied to see at least 3 clean aspirates. Control carotid and cerebral angiographies were performed following the removal of embolic protection and blockage systems. Stents were observed as open (Figure 4). Neurologic examinations were performed during and after the procedure. No neurologic deficits were observed. The patient showed no neurologic complication and was discharged after ASA and clopidogrel treatment. After 2 months, a percutaneous coronary intervention was applied to the RCA. Follow up Doppler USG imaging at months 1 and 6 showed that the stents were open.

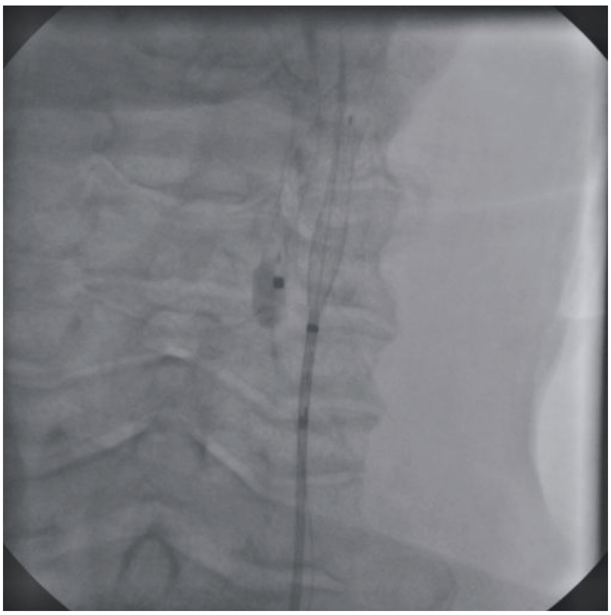

Figure 3. Left ICA stenting with proximal blocking system (MOMA). Anteroposterior cranial.

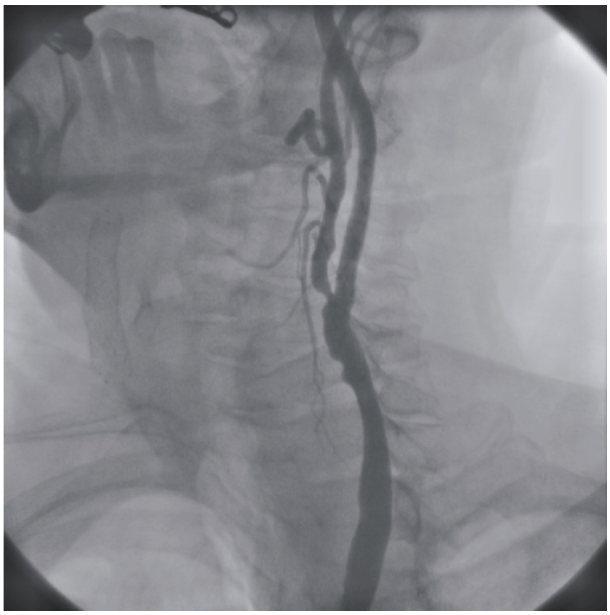

Figure 4. Angiographic image of left ICA after stent and postdilatation. Left oblique cranial.

3. Discussion

Carotid artery stenosis is responsible for 30% of ischemic stroke cases (3). In carotid stenosis that develops due to atherosclerosis, complete antiplatelet treatment and aggressive risk factor modification constitute the first step of the treatment (4). Patients with symptomatic carotid artery occlusion are at a high risk of recurrence and therefore this intervention is necessary. In patients with both ICA and ECA stenosis, there are 3 treatment choices: carotid endarterectomy, intracranial–extracranial bypass surgery, or stents to the ICA and ECA (5–7). Our initial decision was the operation, but the patient and his relatives did not accept the risk, so we focused on the stent. Common embolic protection devices are distally located embolic protection filters (Angioguard, FilterWireEX, SpiderFX, RXAccunet) and proximal blockage systems (MOMA). The first balloon should be in the ECA and the other one in the common carotid in the MOMA system. For this reason, in our case, we performed stenting in the ECA. If the tortuosity and insufficient area after the lesion of the internal carotid artery is too great, we use proximal endovascular occlusion, but if there is a serious disease in the contralateral internal carotid artery, we prefer the distal filter to the proximal blocking system. In our case, the CAS procedure was applied to both the ICA and ECA, because the ostium of the contralateral ECA was severely stenotic. Although there are previous reports on the ECA stent, we are not aware of any previous study that reported ipsilateral ICA and ECA stents during the same session. CAS applicability was increased by developments in the stent technology and embolic protection systems. SAPPHIRE, CREST, and EVA-3S studies and the last guidelines on carotid artery disease also showed that embolic protection devices and operator experience in CAS procedures are very important (2,3,8–11). One such study had 56 patients. Thirty-three arteries primarily received stents, while 25 had primary balloon angioplasty; 52 cases involved endovascular repair of ECA stenosis, while 4 patients with a normal ECA had a covered stent deployed to exclude the ICA stump. The technical success rate was 98.3%. During the first 30 days after the procedure, 1 (1.8%) stroke was reported, while 5 (8.9%) transient ischemic attacks were also described (12). Endovascular repair of the ECA appears to have low rates of perioperative stroke or death but a high rate of transient ischemic attacks. The appropriate type of stent and the use of embolic protection need to be established (7,12,13). In our patient, we used the MOMA proximal blockage system and we observed no embolic complications.

Here, we reported successful stents of both the ECA and ICA during the same session in a patient with severe stenosis.

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