Angioplasty in Stenosis of the Innominate Artery

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Abstract. We describe a successful percutaneous transluminal dilatation (PTD) of an innominate artery stenosis in a 40-year-old patient with aortic arch syndrome. Five years earlier both a left central carotid artery occlusion and an innominate and left subclavian artery stenosis were treated by grafting from the aorta to the distal vessels. At recurrence of the neurological symptoms, reocclusion of the graft to the innominate artery and subtotal stenosis of the left carotid anastomosis were noted. To prevent the hazards of a reoperation, the innominate artery stenosis was dilated by means of PTD via the right brachial artery. Success of the procedure was demonstrated by Doppler sonography and angiography. It appears that PTD serves as an excellent method of treating stenoses of the aortic arch branches in aortic arch syndrome.

Key words: Balloon catheter, Gruntzig - Percutaneous dilatation - Aortic arch syndrome - Innominate artery, stenosis - Ultrasound, Doppler studies

Following the preliminary studies of Olbert et al. [5] and Mathias [2], who applied percutaneous transluminal dilatation (PTD) to the subclavian and carotid arteries, we have also performed a successful transluminal dilatation of a stenosis of the

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Fig. 1. A Aortogram of aortic arch syndrome with innominate artery stenosis and occlusion of the left carotid artery. A stenosis of the left subclavian artery was thought to be present from 1976. B Implantation of a bifurcation prosthesis into the aortic arch with anastomosis to the innominate and left carotid artery. C Late-phase filling of an additional bypass graft from the left limb to the left subclavian artery.
innominate artery in a case of aortic arch syndrome. We believe that no previous report of such a case exists in the literature.

Case Report

A 40-year-old patient with aortic arch syndrome was admitted to our department in August of 1982 following recurrent attacks of cerebral ischemia. The disease was discovered 5 years earlier when this man first presented with symptoms of aphasia and right-sided hemiplegia [8]. Angiography revealed an 80% stenosis of the innominate artery, occlusion of the left common carotid artery, and a slight left subclavian stenosis (Fig. 1). Laboratory evaluation showed a positive serologic test for syphilis. A Dacron velour Y-graft was inserted from the aortic arch to the innominate artery and the left carotid bifurcation (Fig. 1 B). In addition, a bypass was placed from the bifurcation of the left limb to the left subclavian artery (Fig. 1 C).

Histological examination of a specimen of the common carotid artery showed the signs of productive, unspecific angitis with no hint of luetic origin.

Postoperatively the patient was free of symptoms. Intermittent paresthesia of the right hand and aphasia reappeared, however, and a repeat angiogram revealed a high-grade stenosis at the anastomosis between the left limb of the bifurcation and the left carotid artery (Fig. 2) in addition to occlusion of the bifurcation of the right limb to the innominate artery plus occlusion of the bypass to the left subclavian artery (Fig. 2 A). The right carotid was filled from the innominate artery, while the right subclavian artery in a later phase, filled retrogradely from the right vertebral artery (Fig. 2 B). This filling pattern

Fig. 2. A Aortogram, 5 years later shows occlusion of the bifurcated right limb and an increased stenosis of the innominate artery. Orthograde filling of the right carotid artery is seen. In addition, the left vertebral artery is dilated and there is no filling of the right subclavian artery. B Filling of the right subclavian artery via the right vertebral artery is demonstrated, and the left vertebral artery is now only slightly filled. C Stenosis is noted at the anastomosis between the left Y-graft limb and the left carotid artery. C Posttransluminal dilatation, the angiogram shows nearly complete removal of the innominate artery stenosis. Orthograde filling of the right vertebral is observed.