Endovascular Treatment of a Saccular Aortic Arch Aneurysm in a Patient with a Patent Lima Graft

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Introduction

With increasing experience in endovascular treatment of thoracic aortic aneurysms,¹,² the technique of stent-grafting has been extended up to the aortic arch.³ Because of the need for an adequate proximal anchoring zone, stent-grafting in this region may result in left subclavian artery obstruction. It is debatable whether the subclavian artery should be transposed or bypassed to the carotid artery first, to reduce the risk of upper extremity ischaemia.⁴ In this report, we present a patient with an aneurysm originating opposite to the left subclavian artery, who had previously undergone myocardial revascularisation using the left internal mammary artery (LIMA). In this particular case, simply overstenting the left subclavian artery would endanger the patent LIMA graft. Following subclavian–carotid artery transposition, the aneurysm was successfully excluded by endovascular means.

Technical Report

A 71-year-old male, who was investigated for hoarseness, was found to have a 6-cm, saccular aneurysm in the aortic arch opposite the origin of the left subclavian artery (Fig. 1). In 1997, he had undergone myocardial revascularisation using both the saphenous vein and LIMA as bypass grafts. He had no anginal complaints on exertion. The presence of a patent LIMA graft ruled out the possibility of obstructing the origin of the left subclavian artery. Therefore, we first transposed the subclavian artery onto the left common carotid artery. To prevent myocardial ischaemia while creating the

Fig. 1. Preoperative angiogram showing a saccular aneurysm in the transverse aortic arch originating opposite to the origin of the left subclavian artery. Although vaguely due to non-selective angiography, please note the patent left internal mammary artery bypass graft (arrow).
subclavian–carotid artery anastomosis, we temporar-
ily clamped the subclavian artery proximal to the ori-
gin of the vertebral artery and distal to the LIMA, to
maintain low-pressure, antegrade LIMA flow via ver-
tebral collateral flow. Graft flow measurement was
not performed, as it would have required dissection
of the proximal part of the LIMA graft. No ischaemia
was observed during the procedure. Next, the trans-
verse arch aneurysm was successfully excluded
using a thoracic stent-graft prosthesis (Talent LPS™,
Medtronic AVE, Cupertino, CA, U.S.A.). Completion
angiography demonstrated adequate aneurysm exclu-
sion, with a patent subclavian–carotid artery transpos-
tion in addition to the LIMA graft (Fig. 2). Postoperative recovery was uneventful. Follow-up
CT-scanning at 3 months showed no signs of endoleak
or migration of the stent-graft.

Discussion

The necessity for antecedent subclavian–carotid artery
transposition in the endovascular treatment of aortic
arch aneurysms is still in question. Although inten-
tional subclavian artery obstruction with a stent-graft
has been performed without serious ischaemic com-
plications of the upper extremity, it jeopardises left
arm perfusion and may result in cerebrovascular
insufficiency in compromised patients, due to reversal
of flow in the ipsilateral vertebral artery. It may also
prevent complete aneurysm thrombosis due to per-
sistent retrograde flow in the left subclavian artery,
creating a type II endoleak.

Our patient, without doubt, required prior
subclavian–carotid artery transposition, to preserve
antegrade, high pressure bloodflow through the
LIMA graft. In this case, temporary reduction of
bloodflow through the LIMA graft while anastomos-
ing the subclavian artery was well tolerated.

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