

## Results of Endografting of the Aortic Arch in Different Landing Zones

G. Melissano,\* E. Civilini, L. Bertoglio, F. Calliari, F. Setacci, G. Calori and R. Chiesa

Department of Vascular Surgery, "Vita – Salute" University, Scientific Institute H. San Raffaele, Milan, Italy

**Introduction.** Endovascular approach to the aortic arch is an appealing solution for selected patients. Aim of this study is to compare the technical and clinical success recorded in the different anatomical settings of endografting for aortic arch disease.

**Methods.** Between June 1999 and October 2006, among 178 patients treated at our Institution for thoracic aorta disease with a stent-graft, the aortic arch was involved in 64 cases. According to the classification proposed by Ishimaru, aortic "zone 0" was involved in 14 cases, "zone 1" in 12 cases and "zone 2" in 38 cases. A hybrid surgical procedure of supraortic debranching and revascularization was performed in 37 cases to obtain an adequate proximal aortic landing zone.

**Results.** "Zone 0" (14 cases). Proximal neck length:  $44 \pm 6$  mm. Initial clinical success 78.6%: 2 deaths (stroke), 1 type Ia endoleak. At a mean follow-up of  $16.4 \pm 11$  months the midterm clinical success was 85.7%. "Zone 1" (12 cases). Proximal neck length:  $28 \pm 5$  mm. Initial clinical success 66.7%: 0 deaths, 4 type Ia endoleaks. At a mean follow-up of  $16.9 \pm 17.2$  months the midterm clinical success was 75.0%. "Zone 2" (38 cases) Proximal neck length:  $30 \pm 5$  mm. Initial clinical success 84.2%: 2 deaths (1 cardiac arrest, 1 multiorgan embolization), 3 type Ia endoleaks, 1 case of open conversion. Two cases of delayed transitory paraparesis/paraplegia were observed. At a mean follow-up of  $28.0 \pm 17.2$  months the midterm clinical success was 89.5%.

**Conclusions.** Total debranching of the arch for "zone 0" aneurysms allowed to obtain a longer proximal aortic landing zone with lower incidence of endoleak, however a higher risk of cerebrovascular accident was observed. The relatively high incidence of adverse events in "zone 1" could be associated to a shorter proximal neck, therefore this landing zone is reserved for patients unfit for sternotomy. In case of endoleak, discovered after a satisfactorily positioned endograft in the arch, the rate of spontaneous resolution within the first 6 months is high.

**Keywords:** Aortic arch; Endovascular treatment; Stent-graft; Hybrid procedure; Supra-aortic debranching.

### Introduction

A surgical approach to the aortic arch has been made possible by the introduction of cardiopulmonary bypass with deep hypothermia and circulatory arrest.<sup>1</sup> However, the procedure can be associated with significant complications.

The availability of stent-grafts that can be easily delivered and deployed in the aortic arch and that can accommodate its curved anatomy, have prompted many authors<sup>2–7</sup> to use them in this challenging anatomical region. The progress with branched stent grafts that allow a totally endovascular approach has been slow.<sup>8,9</sup> Therefore open surgical rerouting of the supraaortic branches is still needed.

One of several different hybrid procedures may be necessary according to the extent of the pathology and the availability of an adequate landing zone in different segments of the aortic arch. The purpose of this study was to analyse the results recorded in the different anatomical settings of endografting for aortic arch disease.

### Methods

#### Patients

Between January 1999 and October 2006, 178 patients underwent endovascular grafting of the thoracic aorta at our Institution. The aortic arch was involved in 64 cases. There were 56 men and 8 women with a mean age of  $70.4 \pm 10.9$  years (range 25–86 years). An atherosclerotic aneurysm was observed in 53 cases (mean maximum diameter  $62 \pm 14$  mm), post-traumatic

\*Corresponding author. Dr. G. Melissano, MD, IRCCS H. San Raffaele, Department of Vascular Surgery, Via Olgettina, 60, 20132 Milan, Italy.  
E-mail address: [g.melissano@hsr.it](mailto:g.melissano@hsr.it)

aortic rupture in 2 cases, dissecting aneurysm in 3 cases (mean maximum diameter  $58 \pm 8$  mm), penetrating ulcers or intramural haematoma in 3 cases, pseudoaneurysm in 2 cases and endograft collapse due to multiple stent fractures in one case.

An additional surgical procedure of supraortic debranching and revascularization was performed in 37 cases to obtain an adequate proximal aortic landing zone (PLZ) and in 4 cases to achieve a satisfactorily access site. According to the classification proposed by Ishimaru,<sup>10</sup> patients were divided into three groups based to the PLZ involved:

- Zone "0": 14 cases (13 males; mean age:  $73.4 \pm 5.3$  years) including one case of right aortic arch aneurysm.
- Zone "1": 12 cases (9 males; mean age:  $66.7 \pm 11.8$  years).
- Zone "2": 38 cases (34 males; mean age:  $70.4 \pm 12.1$  years) including one case of aberrant right subclavian artery.

Risk factors of patients in the different groups are reported in Table 1. Two patients were treated urgently for symptomatic disease (1 case zone "1", 1 case zone "2") and two patients emergently for true rupture (2 cases zone "2").

The feasibility of the endoluminal intervention, sizing of stent grafts and implant strategy was determined preoperatively, mainly with 16-Row Multislice Computed Tomography with multiplanar reconstructions (Aquilion 16; Toshiba Medical Systems). We considered the proximal aortic neck adequate when the maximum diameter was  $\leq 38$  mm, the length was  $\geq 20$  mm. We used one of several different commercially available stent-grafts (Table 2). All patients received preoperative duplex scanning of the iliac, femoral, carotid and vertebral arteries to assess access site and to evaluate the vertebral and carotid circulation.

Patients were evaluated with postprocedure chest X-ray and contrast CT scans with scheduled follow-up imaging at 1, 6 and 12 months, and yearly thereafter. Angiograms were obtained in selected cases (i.e. endoleaks). Clinical follow-up was also done at regular intervals of 6 months.

### Procedure

All the procedures were performed in the operating room, using a portable digital C-arm image intensifier with road-mapping capabilities. Intraoperative transesophageal echocardiography was used selectively in 6 patients including all dissection cases.

All cases of "zone 0" and "zone 1" were performed under general anaesthesia. In "zone 2", 26 procedures (68%) were performed under general anaesthesia, while epidural or spinal anaesthesia was used in 12 cases (32%). Cerebral activity was monitored by means of continuous electroencephalogram in all cases performed under general anaesthesia.

Preoperative cerebral spinal fluid drainage (CSFD) was instituted in 2 selected patient with previous abdominal aortic surgery<sup>11</sup> and postoperatively in the two patients developing symptoms of spinal cord ischemia.

In 60 cases the common femoral artery, exposed through an inguinal incision, was used as access vessel (93.8%). An iliac access was used in 2 cases (3.1%) and 2 cases (3.1%) had the device inserted through an infra-renal aortic tube graft during combined surgery for AAA and aortic arch.

Different techniques of supra-aortic vessels debranching have been previously described.<sup>2</sup> In summary, debranching of supra-aortic vessels was performed for all "zone 0" cases via a revascularization of the brachiocephalic trunk and left common carotid artery from the ascending aorta. All "zone 1" cases received extra anatomical revascularization of left common carotid artery associated with

**Table 1. Preoperative risks factors**

	Zone "0" <i>n</i> = 14	Zone "1" <i>n</i> = 12	Zone "2" <i>n</i> = 38	Total <i>n</i> = 64	<i>P</i>
Age	$73.4 \pm 5.3$	$66.7 \pm 11.8$	$70.4 \pm 12.1$	$70.4 \pm 10.9$	NS**
Sex (men)	13	9	34	56	NS*
Tobacco use	7	5	19	31	NS*
Diabetes	2	3	5	10	NS*
Hypertension	8	6	22	36	NS*
Pulmonary disease	9	4	21	34	NS*
Renal disease	0	1	9	10	NS*
Cardiac disease	8	3	16	27	NS*
Cerebrovascular disease	2	3	7	12	NS*
Previous AAA repair	0	1	3	4	NS*

\*Chi-square test or the Fisher Exact test; \*\*Kruskal-Wallis test.

Download English Version:

<https://daneshyari.com/en/article/2915089>

Download Persian Version:

<https://daneshyari.com/article/2915089>

[Daneshyari.com](https://daneshyari.com)