Midterm patency rate after saphenous vein grafting with a PAS-Port device

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Recently, a new proximal anastomosis device of a saphenous vein graft (SVG) to the aorta, the PAS-Port device (Cardica, Redwood City, Calif) has been introduced and yielded encouraging results in terms of neurologic complications and early patency.[1,2] However, there is a concern about the midterm (at least 1 year after surgical intervention) patency rate. The aim of this study was to evaluate the midterm patency rate of SVGs whose proximal anastomosis was performed with the PAS-Port device.

CLINICAL SUMMARY

Between January 2004 and September 2006, 69 PAS-Port devices had been used in 66 patients undergoing SVG proximal anastomosis in coronary artery bypass grafting (CABG) at Kokura Memorial Hospital. Sixty-three patients had off-pump grafting, and 3 patients had on-pump beating-heart grafting. The details of the operative data are summarized in Table 1. Bilateral internal thoracic artery grafting for the left coronary territory was our standard method. The gastroepiploic artery was our first choice for revascularization of the right coronary artery territory. We used SVGs when (1) stenosis of the native coronary artery was mild (<90%), (2) arterial conduits had already been used in previous operations, (3) emergency operations were necessary, and (4) the patient had a prior history of gastrointestinal disorders. The proximal anastomosis devices were used basically in case the ascending aorta showed atheromatous changes on an epiaortic echocardiogram. Additional 4-0 Prolene purse-string stitching around the deployed device was performed in 15 (21.7%) of 69 devices to control the bleeding. No patients had difficulty achieving the hemostasis. All the operations were performed by one experienced surgeon. Every patient was given a subcutaneous heparin injection on postoperative days 1 to 4 to prevent postoperative stroke and perioperative myocardial infarction. Oral aspirin was started on postoperative day 1 and continued throughout the follow-up period. No 30-day mortality or intraoperative stroke was observed. Six patients died within 1 year after the operation. Among them, 2 deaths were due to cardiac causes: congestive heart failure (n = 1) and sudden death (n = 1). The other 4 deaths were due to noncardiac reasons: cancer (n = 2), sepsis (n = 1), and liver failure (n = 1). Of 46 midterm survivors (at least 1 year after surgical intervention), 38 (82.6%) consented to late follow-up graft evaluation by means of 3-dimensional computed tomography. Two of 39 devices were occluded, and the 1-year patency rate (FitzGibbon grade A) was 94.9%. No obvious stenosis

TABLE 1. Operative data (n = 66)

Age (y), mean ± SD	69.7 ± 10.3
Female sex, n (%)	16 (24.2%)
Comorbidity, n (%)	
Hypertension	42 (63.6)
Hyperlipidemia	34 (51.5)
Diabetes	25 (37.9)
Peripheral vascular disease	9 (13.6)
Dialysis	14 (21.2)
Cerebrovascular disease	8 (12.1)
Previous coronary intervention	25 (37.9)
Previous myocardial infarction	23 (34.8)
Unstable angina	17 (25.8)
Ejection fraction <40%	6 (9.1)
Left main trunk disease	24 (36.4)
Three-vessel disease	47 (71.2)
Emergency procedure	10 (15.1)
Redo procedure	4 (6.1)
Preoperative IABP	4 (6.1)
BITA grafting	41 (62.1)
Off-pump	63 (95.6)
No. of distal anastomoses, mean ± SD	3.7 ± 1.2
Details of saphenous vein grafting, n (%)	
Endoscopic harvesting	12 (17.4)
Sequential grafting	26 (37.7)
Target coronary artery, n (%)	
Left anterior descending artery	8 (11.6)
Circumflex artery	11 (15.9)
Right coronary artery	43 (62.3)
Right coronary artery and circumflex artery	7 (10.1)
Degree of stenosis, n (%)	
90% <	34 (49.3)
75% >	35 (50.7)
Location of the proximal anastomosis, n (%)	
Ascending aorta	68 (98.6)
Descending aorta	1 (1.4)

SD, Standard deviation; *IABP*, intra-aortic balloon pump; *BITA*, bilateral internal thoracic artery.

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TABLE 2. Details of the occluded saphenous vein grafts

	Preoperative characteristics	Endoscopic harvesting	Sequential grafting	Target coronary artery	Degree of stenosis	Location of the proximal anastomosis
73-year-old man	Diabetes	No	No	RCA	75%	Ascending aorta
49-year-old man	Dialysis, diabetes, CVD	No	No	RCA	90%	Ascending aorta

RCA, Right coronary artery; *CVD*, cerebrovascular disease.

of SVGs (FitzGibbon grade B) was observed. Of the 38 patients who underwent late graft evaluation, 24 did so at least 2 years after surgical intervention. The 2-year cumulative patency rate was 91.7% (22/24). All the results were evaluated by an experienced radiologist. Details of the occluded SVGs are given in Table 2.

DISCUSSION

Stroke is a devastating complication of CABG. Manipulation of the aorta using techniques such as crossclamping is thought to be a predisposing risk factor. The off-pump technique has brought more attention to reduce this devastating complication. Use of an aortic side clamp requires aortic manipulation, thereby precluding the major advantage of the off-pump technique. Several devices for proximal anastomosis of SVGs to the aorta have been developed and can facilitate clampless proximal anastomosis. Although the results have been satisfactory in terms of neurologic complications, there have been some concerns about early and long-term patency rates. The early patency rate of the previous generation of the proximal anastomosis device, the Symmetry device (St Jude Medical, Inc, Minneapolis, Minn), was satisfactory, but production was discontinued because of the poor midterm and long-term results.[3-5] The PAS-Port device has the potential to yield better results than the Symmetry device for the following reasons: (1) the stents were located outside and not inside the SVG, which did not reduce the total amount of blood exposed to nonintimal surfaces inside the aortic lumen, and (2) the stents were composed of 316L medical grade stainless-steel and not nitinol, which can cause intimal hyperplasia.[1]

We realize that the gold standard for the evaluation of graft patency is angiography. It is relatively difficult to assess the details of anastomosis sites with computed tomography. Therefore we might have missed a number of stenotic vessels. In addition, this is a very small cohort of patients.

In conclusion, this study demonstrated the satisfactory results of midterm patency rate after placement of SVGs with a PAS-Port device. This device could be useful for CABG in case the ascending aorta showed the severe atheromatous change to a degree that precluded the use of a side clamp. However, a larger-scale study and a longer follow-up period will be mandatory to confirm the reliability of this device.

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Late rupture of polytetrafluoroethylene neochordae after mitral valve repair

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Mitral valve repair is the procedure of choice to correct mitral regurgitation. The introduction of polytetrafluoroethylene (PTFE) sutures was an important contribution by David[1] and Zussa and colleagues[2] for the treatment of chordal shortening or for chordal replacement during mitral valve repair. This report describes a patient with acute-onset hematuria 11 years after mitral valve repair who was found to have fractured PTFE neochordae necessitating mitral valve replacement.