tions are more often associated with a left-sided cervical arch. Physical examination reveals a large pulsatile mass in the supraclavicular region.⁴ 3D-CT, angiography and MRA are useful for definite diagnosis and surgical treatment.

Deletion of chromosome 22q11 was recently reported in some cases of cervical aortic arch⁵ but was not evident in this case. The female predilection for aneurysm formation is consistent with a genetic factor.¹

The pathologic finding of cystic medial degeneration in the aneurysm has been reported in a large surgical series and supports the importance of recognition and surgical intervention in this condition, whether patients are symptomatic or not.²

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Mechanical support of the unrepaired postinfarction ventricular septal defect with the Abiomed BVS 5000 ventricular assist device

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The Abiomed BVS 5000 (Abiomed, Inc, Danvers, Mass) is an extracorporeal pneumatic ventricular assist device (VAD) that has been used in a variety of acute cardiac conditions.¹ The purpose of this report is to describe the use and cannulation strategy of the BVS 5000 VAD as a bridge to transplantation in a case of unrepaired postinfarction ventricular septal defect (VSD).

Clinical Summary

A 62-year-old American man with a history of coronary artery disease had a myocardial infarction while in the Dominican Republic on September 6, 2001. On September 11, 2001, he became hypotensive from reinfarction. Physical examination revealed a new heart murmur. An echocardiogram showed a posterior ventricular VSD. He was given intravenous dopamine and prepared for transfer to the United States for further management. As a result of the World Trade Center attack, air transportation was suspended. On September 13, 2001, permission was granted for an emergency flight to Philadelphia. The patient was in cardiogenic shock with multiple organ system failure. He was intubated, he

TABLE 1. Oxygen saturations and hemodynamic variables before and after VAD placement

	Before VAD	After VAD
Oxygen saturation		
Right atrium	60%	58%
Right ventricle	93%	62%
Pulmonary artery	82%	63%
Aorta	95%	100%
Systemic blood pressure (mm Hg)	80/50	152/86
Pulmonary arterial pressure (mm Hg)	55/33	24/14
Central venous pressure (mm Hg)	28	12
Cardiac output (L/min)	3.4	5.3

was given additional inotropic and vasoconstrictive drugs, and an intra-aortic balloon pump was inserted. The catheterization showed severe-triple vessel coronary artery disease (poor runoff) with moderate pulmonary hypertension and a large posterior VSD. The right atrial, right ventricular, and pulmonary artery saturations demonstrated a shunt at the ventricular level (Table 1). The patient was transferred to the operating room for management.

The patient was placed on cardiopulmonary bypass with mild hypothermia. The heart showed minimal contractility and a massive acute posterior wall myocardial infarction. The decision was made to place the Abiomed VAD without repairing the VSD or bypassing the coronary arteries. Inflows to the blood pumps were established at the atrial level and outflows were to the great arteries. The patient was weaned from cardiopulmonary bypass with excellent hemodynamic and mechanical support (5 L/min). The patient was transported to the cardiothoracic intensive care unit in stable condition, with elimination of the shunt (Table 1).

After the operation, the patient awoke with an intact neurologic status and stable vital signs. He remained on VAD support for 8

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weeks, with improvement in hepatic function. Although the renal function improved, the creatinine clearance was poor. The patient underwent intermittent dialysis through side access ports on the right VAD tubing. Assessment of cardiac recovery was performed with serial echocardiograms, demonstrating persistent severe biventricular failure. The decision was made to list the patient for heart and kidney transplantation. On November 12, 2001, the patient underwent successful double organ transplantation. The postoperative course was uneventful, with no major complications. The patient was discharged to a rehabilitation center for several months of recovery. He was then discharged to home and remains alive and well more than 1 year later.

Discussion

The management of postinfarction VSD remains a therapeutic challenge. Surgical mortality remains high, and initial repairs may be plagued by persistent heart failure, VSD recurrence, and arrhythmia.² As such, this entity continues to be the subject of cardiothoracic surgical debate regarding the timing and type of surgical repair.

One novel approach to this entity includes the use of a ventricular assist device (VAD) for cardiac support, circulatory stability, and maintenance of end-organ perfusion. The role of the VAD may be as an adjunct to an attempted repair. In this scenario, the postinfarct VSD is repaired, coronary bypass grafting is performed, and the VAD is placed for ventricular unloading and maintenance of adequate cardiac output. The use of implantable VADs for this condition was described by Faber and colleagues³ with the HeartMate (Thoratec Laboratories, Pleasanton, Calif) and

Novacor (WorldHeart Corp, Ottawa, Ontario, Canada) systems. Another scenario, however, is to place the VAD without attempting an initial repair. The rationale behind this approach is to avoid operating on fresh infarct and to establish prompt circulatory control. The BVS 5000 VAD has the advantage that it can be placed with or without cardiopulmonary bypass. In addition, inflow to the VAD can be easily accomplished at the atrial level. This is an ideal cannulation strategy for a VSD, in which it is important to avoid a shunt at the ventricular level. As demonstrated in our case, mechanical cardiac support was successful in restoring hemodynamic stability and reversal of multiorgan system failure.

In conclusion, the postinfarction VSD may be managed in a variety of ways. This case demonstrates the novel use of the BVS 5000 VAD with biatrial cannulation for the uncorrected postinfarction VSD as a bridge to transplantation.

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Urgent inferior vena cava replacement with an autologous pericardium tube graft

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Surgical interventions involving the suprarenal inferior vena cava (IVC) are uncommon. They are usually required after the partial or complete resection of the IVC for the management of malignant and nonmalignant diseases.^{1,2} Three surgical techniques have been reported: patch angio-

plasty,³ replacement with spiral saphenous vein graft,¹ and replacement with extended polytetrafluoroethylene (ePTFE) grafts.^{1,2,4} We report on an emergency case in which the accidentally transected suprarenal IVC was replaced with an autologous pericardial tube.

Clinical Summary

A 42-year-old male man had right-sided flank pain and elevated liver enzymes. Abdominal ultrasonography and computed tomographic scan demonstrated a 5-cm right renal mass (renal cell carcinoma). Results of the metastatic workup were negative, and the patient underwent a laparoscopic right radical nephrectomy.

The laparoscopic dissection of the renal tumor was difficult and eventually complicated by severe bleeding, which could not be controlled laparoscopically. The abdomen was opened, and by manual tamponade of the undersurface of the liver and infusion of blood and intravenous fluids, blood pressure could be maintained.

The cardiothoracic surgical team was consulted. A standard median sternotomy was performed and extended to the laparot-

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