We do disagree with some of the statements made in Graham and O’Kane’s letter regarding the issues surrounding graft patency and myocardial infarction. That issue is extremely complex and the subject of great international debate. One should not conclude that aprotinin causes myocardial infarction, a hypercoagulable state, or an independent effect leading to a “bad outcome.” It is not our wish to debate this point. However, a number of papers that provide an opposing view regarding these issues were not quoted by Graham and O’Kane.

In conclusion, the international debate regarding the effects of aprotinin and antifibrinolytic agents on myocardial infarction and graft patency is separate from the data and conclusions presented by our article.

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Myocardial “hybrid” revascularization: Intermediate results of an alternative approach to multivessel coronary artery disease

To the Editor:
Revascularization of multivessel coronary artery disease with the left internal thoracic artery (LITA) and additional vein grafts using cardiopulmonary bypass (CPB) and cardioplegic arrest currently represents the standard technique in coronary surgery. Aiming for less invasive cardiac surgery, several groups have reported encouraging results with minimally invasive direct coronary artery bypass (MIDCAB) grafting of the left anterior descending coronary artery (LAD) to anterior cardiac vessels on a beating heart without CPB through a left anterolateral minithoracotomy. However, due to limited access through the small incision, this approach cannot be applied to multivessel revascularization without additional incisions or use of CPB. So that the benefits of MIDCAB approaches could be extended to patients with multivessel disease, a safe and effective integrated coronary revascularization procedure combining minimally invasive surgical revascularization of the LAD with interventional procedures was introduced.

Very promising results in a series of 31 patients were recently published by Zenati and associates. Having reported similar initial results in 35 consecutive patients undergoing this integrated “hybrid” procedure in a multicenter experience, we present here subsequent intermediate follow-up results in 26 patients who underwent hybrid revascularization in Hannover, Germany.

Between December 1996 and January 1999, 21 men and 5 women (mean age 56.6 ± 18.8 years) underwent a hybrid revascularization performed as a primary MIDCAB procedure for grafting of the LAD to the LITA followed by staged angioplasty (n = 23) and stenting (n = 8) of additional coronary lesions. Five patients had a moderately reduced left ventricular ejection fraction between 30% and 50% and 3 patients had a left ventricular ejection fraction of less than 30%. The distribution pattern of 1-, 2-, and 3-vessel disease was 4, 14, and 8, respectively. Previous myocardial infarctions were recorded in 16 patients. The degree of revascularization achieved during the operation was “anatomically complete” in 18 patients (69.2%) and “anatomically incomplete but functionally adequate” in 8 patients (30.8%).

After an uneventful postoperative course, coronary re-angiography at the time of intervention revealed patent and functioning LITA grafts in all patients. Procedure-related complications did not occur. All patients remained angina-free and had stress electrocardiograms showing no abnormalities within 30 days after the operation.

At a mean interval of 11.4 ± 7.7 months after the operation, all patients are alive. Follow-up information was obtained at the time of follow-up coronary angiography in 15 patients. The remaining 11 patients refused the angiographic examination because of complete absence of any symptoms but were contacted by telephone.

Two patients with angina on moderate exertion required additional interventions because of new significant lesions in other than the previously revascularized coronary arteries. One patient was completely free of symptoms with a subtotal restenosis in the formerly dilated right coronary artery and was maintained on medical therapy alone. All other patients were angina-free without signs of acute ischemia on stress electrocardiogram. Angiographically, LITA anastomoses and interventionally treated coronary arteries were found to be patent. None of the patients had had any ischemic coronary events after the hybrid procedure.

Thus we can confirm the excellent result described by Zenati and associates after integrated coronary revascularization. In our experience, the hybrid approach of myocardial revascularization by means of a LITA-LAD MIDCAB procedure followed by additional interventional therapy appears to be safe and effective in complete or near-complete coronary revascularization in patients with multivessel disease. Subgroups of patients who might receive special benefit from this new approach include the very elderly and patients requiring reoperation with significant comorbidity and a high-risk constellation for CPB with median sternotomy. Also, younger and otherwise healthy patients with aggressive 2-vessel disease, in whom further coronary revascularization procedures seem likely, may benefit from this hybrid approach rather than a less invasive procedure using the Octopus system.

As progressively more centers achieve excellent experience
with this integrated approach, detailed evaluation in larger randomized multicenter studies is warranted to document long-term effectiveness of hybrid revascularization compared with conventional coronary artery bypass grafting or interventional therapy alone.

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REFERENCES


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Mechanical mitral valves without long-term anticoagulation up to thirteen years

To the Editor:

If a mechanical valve could be left without anticoagulation, a continuous risk factor for severe bleeding, with an incidence of around 1% every year, could be avoided.

Fig 1. The microporous surfaced 25 mm mitral Björk-Shiley Monostent heart valve after 2½ years without anticoagulation in a goat. The valve is viewed from the left ventricle with the disc in the open position. The carbon-coated Teflon suture ring is covered with thin, smooth, glistening yellow endothelium extending over the groove and adjacent part of the valve flange.

Ordinary Björk-Shiley Monostrut heart valves (Shiley, Inc, Irvine, Calif) were inserted in the mitral position in goats. After 1 year without anticoagulation, we found no instances of thrombosis on the pyrolytic discs or on the metal struts, but the suture rings in all cases were covered by an endothelialized layer of thrombus. From this layer a thrombus did protrude into the valve orifice in 8 of 9 goats.

The solution was to catch the covering from the suture ring and have it endothelialized and firmly fixed to the metal ring. It was possible to sinter small, 20 to 30 μm round pearls of the same metal to the metal ring of the valves at high temperature in 3 layers. This enables roots to develop between the pearls so that the covering will not come loose. An endothelialized covering always developed on microporous surfaced rings tied into the superior vena cava in goats. With 100 μm pearls the vascular covering was too thick.

In 1984 we started to implant the microporous surfaced mitral valve in goats. After 2½ months without anticoagulation, the microporous area showed a homogeneous endothelialized surface with nutrition direct from the blood so that it stayed thin for more than 5 years. The continuous covering from the suture ring went over the groove in the valve, and after 5 years without anticoagulation the valve was still nicely covered and the goats produced offspring without problems.

The pilot study. This microporous surfaced mitral valve prosthesis has the same strength as the Björk-Shiley Monostrut valve, which has been implanted in about 140,000 patients during a 17-year period without any mechanical failures. We operated on a small group of 12 patients 11 and 13 years ago. All these patients had sinus rhythm. There were 5 children aged 7 to 15 years with mitral insufficiency and cardiomegaly. Patient 10 was cachectic and needed enteral nutrition for weeks before the operation. An 8-year-old boy (case 9) had a severe form of sickle cell anemia, with a hemoglobin