Interestingly, we created our model of ischemic cardiomyopathy by placing an ameroid constrictor on the branch of the circumflex artery in 12 adult sheep.

In our experiment, 4 weeks after constriction, we randomly assigned 3 groups (4 animals per group) to transpericardial injection (3 sites per animal): sham treatment (saline solution with denatured cells), control (no injections), and endothelial cell fibrin meshwork groups (autologous mature endothelial cells, 5×10^5 per injection site harvested from jugular veins). Eight weeks after transepicardial treatment, animals were assessed for myocardial function (by means of echocardiography), myocardial blood flow (MBF), and capillary area (by means of histology).

We demonstrated improved capillary density and MBF in keeping with their speculation that, "A coronary ligation model of myocardial infarction, in which a more extensive peri-infarct border zone could harbor viable but hypoperfused cardiomyocytes and endothelial cells, might result in greater angiogenesis."

One month after constriction, MBF in the ischemic myocardium decreased to 70% of baseline value ($P < .001$). Two months after reoperation and the beginning of treatment, animals were killed, and MBF was found to have decreased to 28% versus baseline values in the control and saline solution groups ($P < .001$). MBF in the endothelial cell group significantly increased to 108%.

In normal nonischemic myocardium in all 3 groups, there were 205.54 ± 12.31 capillaries/mm². Three months after constriction (and 2 months after reoperation and beginning of treatment) in the control and saline solution groups, there was a decrease up to 51% in capillaries per square millimeter ($P < .001$ vs baseline). However, although this decreased significantly in the control and saline solution groups versus baseline values, in the endothelial cell group this increased to 146% ($P < .001$). Hence all of our results confirmed those in the report of Kim and associates.¹

However, they also concluded that "increasing blood flow by endothelial cell transplantation in this model did not improve contractility or prevent ventricular dilatation," and "we plan to perform autol-

ogous endothelial cell transplantation in our clinically relevant porcine model of occlusion of the left anterior descending coronary artery. We anticipate that angiogenesis may improve regional and global function."

In our investigation, 4 weeks after constriction, left ventricular ejection fraction (LVEF) decreased to 75% ($P < .001$). Two months later, LVEF decreased to 57% in the control and saline groups ($P < .001$ vs 4 weeks and baseline). In the endothelial cell group LVEF increased to 89% of baseline values but continued to be less than baseline value ($P < .05$). However, LVEF in this group was significantly better than in the control and saline solution groups ($P < .001$).

On the basis of our data, we think that use of endothelial cell transplantation within a 3-dimensional matrix system can be used to induce angiogenesis in patients who cannot be adequately revascularized by using standard techniques. Exploring autologous mature endothelial cell transplantation might become a useful alternative to gene and protein therapy. We recently completed studies involving a large number of animals; these results are pending.

Valeri Chekanov, MD, PhD^a

Nicholas Kipshidze, MD, PhD^b

Milwaukee Heart Institute

Aurora/Sinai Medical Center

Milwaukee, Wis^a

Lenox Hill Heart & Vascular Institute

Cardiovascular Research Foundation

Lenox Hill Hospital

New York, NY^b

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Reply to the Editor:

Chekanov and Kipshidze performed a series of experiments that appear to confirm our findings that endothelial cell transplan-

tation improved perfusion after myocardial injury. Recently, a variety of techniques have been used to induce angiogenesis to treat patients who are not candidates for conventional methods of revascularization. Cell transplantation has the advantage of inducing angiogenesis by a variety of mechanisms because the technique is not limited to the release of a single protein.

Chekanov and Kipshidze used an endothelial cell fibrin meshwork applied to the epicardial surface of an ischemic region. They found that this technique induced angiogenesis. The mode of delivery and the number of cells engrafted might critically affect the benefits achieved with cell transplantation. The optimal conditions have not been well defined. In addition, the cell type that induces the most beneficial response has not been adequately established. Endothelial cells induce an extensive capillary network, but they might not induce the formation of sufficient conduit vessels. Further research into this important area might establish which cell type, which cell number, and which mode of delivery are optimal to induce angiogenesis.

Ren-Ke Li, MD

Richard D. Weisel, MD

Department of Cardiovascular Surgery

Toronto General Hospital

200 Elizabeth St

Toronto, Ontario M5G 2C4, Canada

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Missing data from mesothelioma study

To the Editor:

The phase II trial of surgery and radiation of malignant mesothelioma by Rusch and colleagues¹ is an important addition to the literature, documenting contemporary efforts to control and eventually cure this so far incurable malignant process. The 8% mortality after extrapleural pneumonectomy reflects the tremendous strides in surgical techniques effected in recent decades. The rigorous staging confirms a major attempt to bring better science to this capricious disease.

Nevertheless, Rusch and colleagues¹ have excluded a host of important information from their publication. I hope that they will be able to strengthen the report by rectifying some of these omissions:

1. To understand the real world from which their patients were selected, we need to know how many patients were refused entry into their study.
2. The benefits of combined resection and radiation therapy might be put into better perspective if we could see the survival data and curves on the patients refused entry into the study. All hospital tumor boards certified by the American Cancer Society will have this information.
3. Because early studies by Devalle and coworkers² indicated a late surgical mortality of 11% beyond the usual 30-day perioperative period, it is important to learn whether such events still occurred in the 1990s. Similarly, early reports noted by Ruffie and colleagues³ indicated 10% late suicides after surgery. A statement regarding the occurrence or nonoccurrence of suicidal deaths during long-term follow-up is important in assessing the quality of life and the suffering of the patients.
4. What were the lengths of the hospital stays of the included and the excluded surgical groups? How many days of hospitalization were required in long-term follow-up for the complications of radiation therapy and surgery? These data are important in assessing the patients' quality of life as well as the cost of care.
5. How many of the patients had large recurrent or persistent pleural effusions? Several investigators have suggested a survival advantage for this group relative to those with a soft-tissue mass.
6. It is interesting that 69% of this selected group of surgical patients had such high staging (III and IV). By comparison, Sugarbaker and associates⁴ found 136 of 183 (74%) to have stage I and II disease in a series that had excluded 2 to 3 patients for every patient accepted. Does this difference indicate that Sugarbaker and associates⁴ had a more effective technique to screen out patients with stage III and IV disease for surgical resection? It is disappointing that so few patients with stage I and II disease were found in the study of Rusch and colleagues.¹ Perhaps rigorous intraoperative staging up-

grades preoperative stage to the extent that few patients with stage I and II disease remain, even with prompt evaluation after the onset of symptoms. Presumably nonsurgical disease would be falsely staged lower because of the absence of mediastinal sampling, laparoscopy, and so on, making comparison of surgical and nonsurgical groups more difficult.

7. The median survival was stated to be 17 months in this study, but that number excluded the 7 deaths and the 21 patients whose disease could not be completely resected. Obviously, we need to know the median survival of all patients operated on, including perioperative deaths, if we are to provide honest informed consent with surgical referrals.
8. Rigorous statistical assessment of surgical trials becomes even more important in light of a recent consecutive, unselected series of 26 patients with malignant mesothelioma with pleural effusion and treated by medical thoracoscopic talc pleurodesis as the primary modality of care. They had a median survival of 19.4 months and have a mean survival that is now reaching 22.8 months.⁵⁻⁷ Although Rusch⁷ has previously indicated the difficulties of doing randomized controlled studies in this disease, such studies may be necessary to separate theoretic from the real benefits of surgery.

Yossef Aelony, MD

Clinical Professor of Medicine

Harbor-UCLA Rancho Palos Verdes

Director of Pulmonary Function Laboratory

Southern California Permanente Medical

Group

Harbor City, CA 90710

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Early bypass occlusion in patients with the St Jude Medical Symmetry connector

To the Editor:

In recent years, off-pump coronary artery bypass grafting has gained increasing acceptance because of the reduction of possible negative effects of extracorporeal circulation. This technique was shown to be beneficial, especially in elderly patients.¹ However, the manipulation of a possibly diseased ascending aorta in elderly patients might increase the risk for neurologic complications.²

In May 2000, St Jude Medical, Inc (Minneapolis, Minn) introduced an anastomotic device (Symmetry Aortic Connector System) to facilitate the proximal vein-aorta anastomosis without side clamping the aorta. Since June 2001, we have used the Symmetry mechanical anastomotic device preferably in off-pump coronary artery bypass grafting procedures, especially when transesophageal echocardiography revealed a calcified ascending aorta.³ Between June 2001 and April 2002, we have deployed the device in 51 male and 10 female patients (mean age, 68.6 ± 8.6 years). A total of 77 Symmetry connectors were used (1.3 per patient). Loading of the connector was simple, and time for anastomosis was less than 15 seconds. After deployment, the free graft flow was assessed by removing the bulldog clamp from the