5. Katz MR, Bonatti JO. Totally endoscopic coronary artery bypass grafting on the arrested heart. *Heart Surg Forum*. 2007;10:E338-43.

doi:10.1016/j.jtcvs.2008.02.056

Reply to the editor:

I appreciate the earnest comments of my colleagues.

Evidently, we see the potentials of tele-robotics in a different perspective. They believe not only that robotics is the future of cardiac surgery, but also that the future is already here! I respectfully disagree.

They kindly recall my role as an “innovator.” With my 12 patents (the last one in 2008), I would not deny it. However, I was also the one who, as the invited discussant to the first lecture of Andreas Gruntzig, stated that coronary balloon angioplasty will have an unacceptable recurrence rate, and I also proved soon after its introduction that aortic balloon valvuloplasty will be a disaster. To be an innovator means not to “change” but to change toward the better.

In today’s era of evidence-based medicine, the rules of innovation are strict. Informed consent is not a nebulous concept anymore. The margins of clinic and industry are better defined. Novel methods must undergo intense scrutiny not only from a clinical standpoint but also from an ethical and economic aspect. Because results of telerobotics might have reached, but certainly did not exceed, those obtained with simpler minimally invasive methods and because telerobotics has definite marketing undertones, with its costs now exceeding a billion dollars in equipment alone, we are obligated to ask specific questions. In my editorial I was asking these questions with an open mind but also with a healthy dose of old-fashioned skepticism.

The closing words of my editorial were these:

Elements of robotics could indeed be part of the future technology of minimally invasive cardiac interventions. The proper way to proceed with this endeavor however, is not to flood the market with billions of dollars worth of hardware, most of it already obsolete, but to limit their use to a few centers with sincere professional interest, until in well-controlled trials, the technology proves itself economically sound, as well as clinically superior to that which we already have today.

The proof is on you, gentlemen.

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Simultaneous hybrid coronary revascularization reduces postoperative morbidity compared with results from conventional off-pump coronary artery bypass

To the Editor:

This study describes a single-center experience with hybrid procedures in a small patient group of 15 hybrid patients compared with a group of 30 matched off-pump patients. The study has 2 major shortcomings I want to address. First, the grafts used differed between the patients because vein grafts, bilateral internal thoracic arteries, and radial arteries were used. The choice of graft influences patency, as well as potential blood loss. Second, the blood loss in their off-pump group was rather high (>1000 mL). Third, and most important, the quality of revascularization remains an issue in stent implantation. Although the authors tried to address this, they used the wrong method because computed tomographic angiography does not allow for sufficient detection of in-stent restenosis. Additionally, the group sizes are too small to allow for a determination of a trend toward better 1-year graft patency; a single stent occlusion would turn the whole trend. Finally, off-pump coronary artery bypass does not require occlusion of coronary arteries for 8 to 12 minutes for each anastomosis; by inserting a shunt, which is standard in most centers, this occlusion can be reduced to less than 1 minute. For these reasons, the conclusions drawn from the results of this study are that the hybrid procedure is possible, even with good clinical long-term results. The study does not provide sufficient data to prove any superiority of the hybrid approach compared with the off-pump coronary artery bypass procedure with complete surgical revascularization.

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Reply to the Editor:

A small single-center study cannot provide definitive answers to any of the important questions posed by Dr Gulbins. We agree that our data do not support the conclusion that the hybrid approach is superior to the off-pump coronary artery bypass (OP-CAB) procedure. An important goal of this article is merely to provoke debate about how innovations such as this might be used to improve the results for surgical revascularization.

There is no question that differences in clinical outcomes between the 2 groups were driven by variables other than the use of a small thoracotomy instead of a median sternotomy. For example, differences in the choice of conduits undoubtedly influenced outcome. A key advantage of the hybrid procedure is the use of percutaneous coronary intervention/stenting as a means of avoiding the well-known shortcomings of saphenous vein grafts that is used in more than 95% of coronary artery bypass grafting procedures done through a sternotomy. Computed tomographic angiographic follow-up is not adequate to detect in-stent restenosis, but the use of coated stents according to the entry criteria of our study minimized the expected risk of this problem to less than 10% in our cohort.¹ The risk of thrombosis is increased with these types of stents, but thrombosis has a dramatic presentation that can be reliably diagnosed by clinical means. Therefore the advantages provided by the use of invasive angiography instead of computed tomographic angiography for investigating the benefits of using stents versus the saphenous vein graft in our cohort would have been modest.

We agree that the blood loss in the OPCAB group was higher than has been reported by other groups. This might have reflected a more rigorous assessment of intraoperative losses, including the volume of blood retrieved by the cell saver; weighing of sponges; and estimation of other losses. It also might reflect a higher-risk population of patients than have been enrolled in prior OPCAB analyses. Nonetheless, the blood loss and rate of transfusions for the minimally invasive group was clearly less than has been reported in most other OPCAB reports.²