artery did not preclude direct connection to the right-sided inferior vena cava. This patient also had a previously performed bidirectional superior vena cava-pulmonary artery anastomosis, which did not preclude mobilization of the pulmonary arteries and direct connection. We agree with Di Carlo, Carotti, and Amodeo that extensive mobilization of both branch pulmonary arteries (and the superior vena cava-pulmonary connection, if present) must be performed to facilitate the procedure.

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Deep sternal wound infection after sternotomy

Reply to the Editor:

We read with interest the article by The Parisian Mediastinitis Study Group, "Risk Factors for Deep Sternal Wound Infection After Sternotomy: A Prospective Multicenter Study" (*J Thorac Cardiovasc Surg* 1996;111:1200-7). The study coordinators are to be commended for their thorough and comprehensive work. However, their findings are surprising and deserve several comments.

Among 960 patients operated on for coronary artery bypass grafting (CABG) in 10 cardiac surgical units, 32 patients had a deep sternal wound infection (DSWI) for an incidence of 3.3%. Among these patients, 126 underwent bilateral internal thoracic artery (ITA) grafting, and a DSWI developed in 11 of these patients (8.7%). By multivariate analysis, among other risk factors, bilateral ITA grafting was a significant independent predictor for postoperative DSWI (odds ratio 4.2, 75% confidence interval 1.9 to 9.2, $p = 0.0003$).

The astonishingly high rate of DSWIs after bilateral ITA in this multicenter study is particularly distressing because the combined mortality and morbidity of this dreadful complication would neutralize the potential benefits of double ITA.

Although the authors have used strict definition criteria, it is not clear how the diagnosis of DSWI was made in the 10 patients who did not undergo reoperation, nor is it clear how they were treated.

The authors consider this high incidence of mediastinitis to be due to the prospective data collection and more stringent definition of wound infection. They also state that preoperative risk score assessment for DSWI, change in operating room tactics, and better patient selection for bilateral ITA could decrease the incidence of DSWI. However, they fail to mention the guidelines used for double ITA grafting in the various centers.

Risk factors for mediastinitis are multiple and widely known.¹⁻³ Patient-related risk factors like obesity or diabetes cannot be modified. However, procedure-related variables like operating room policies and operative techniques can be changed, with a rewarding influence on results.

Among 450 consecutive patients undergoing CABG with double ITA grafting in a single center, we observed three DSWIs (0.66%) using the criteria of the Centers for Disease Control and Prevention. Double ITA was performed in 45% of the total population of patients undergoing CABG. Contraindications for bilateral ITA were age older than 70 years, urgent revascularization, and association of diabetes and obesity. No mediastinitis occurred in the 54 patients with diabetes (11.8%). ITAs were harvested by the senior surgeon, always using skeletonization with no electrocautery.

If DSWIs after CABG are to be reduced to acceptable levels and our patients are still to benefit from the advantages of two thoracic arteries, ITA harvesting technique, operative time, and method of sternal closure are among some of the surgically induced risk factors for mediastinitis that should be addressed.

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REFERENCES

1. Grossi EA, Esposito R, Harris LJ, et al. Sternal wound infection and use of internal mammary artery grafts. *J Thorac Cardiovasc Surg* 1991;102:342-7.
2. Kouchoukos NT, Wareing TH, Murphy SF, Pelate C, Marshall WG. Risks of bilateral internal mammary artery grafting. *Ann Thorac Surg* 1990;49:210-9.
3. Loop FD, Lytle BW, Cosgrove DM, et al. Sternal wound complications after isolated coronary bypass grafting: early and late mortality, morbidity and cost of care. *Ann Thorac Surg* 1990;49:179-87.

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Reply to the Editor:

The comments by Sousa Uva, Fischer, and Bical regarding the high frequency of deep sternal wound infections (DSWIs) after bilateral internal thoracic artery (ITA) grafting in our study deserve several answers.

Surveillance methods and definition of sternal infection in our study may partly explain the high ratio of DSWI. As indicated in the article, the prospective collection of DSWIs and prolonged surveillance after hospital discharge usually lead to a more sensitive and accurate detection of events in such risk factor studies. Specifically, risk of DSWI after bilateral ITA grafting was 1.5% to 3.8% in five retrospective studies¹⁻⁵ and was 6.9% in one prospective study.⁶

You raise the question of diagnosis of DSWI in the absence of sternal wound débridement. Indeed, the definition proposed by the Centers for Disease Control and Prevention relies on anatomic and clinical criteria. Ten of 42 sternal wound infections were limited to superficial sternal bone and were considered DSWIs. These patients did not undergo a reoperation, instead receiving local treatments.

Criteria for bilateral ITA grafting in the 10 centers were