TABLE 1. Variation in microembolic counts among different studies

Study	On-pump	Off-pump
Abu-Omar et al, 2004 ³	275	40
Motallebzadeh et al, 2004 ⁴	2016	16
Scarborough et al, 2003 ⁵	372	47
Lund et al, 2003 ⁶	90	16
Lee et al, 2003 ⁷	575	16
Mullges et al, 2003 ⁸	175, 413*	—
Bowles et al, 2001 ⁹	1766	27
Fearn et al, 2001 ¹	136	—
Diegeler et al, 2000 ¹⁰	395	11
Borger et al, 1999 ¹¹	152, 249†	—
Taylor et al, 1999 ¹²	207	—

*Different cannulation techniques. †Difference in cannulation site.

of high-intensity transient signals and avoids interobserver variability, whereas discrimination between solid and gaseous microemboli may have important pathophysiological, therapeutic, and prognostic implications.

The limitation of undercounting showers of microemboli (such as during removal of crossclamps and side clamps) was, in fact, discussed in our article. Although Motallebzadeh and Jahangiri suggest that this limitation may be responsible for a large difference in embolic count relative to previous reports, a review of the literature reveals that there is already wide variability among different studies (Table 1) because of differences in detection characteristics among various transcranial Doppler systems. Furthermore, the phenomenon of “undercounting” may actually serve to underestimate the benefits of off-pump surgery with a “no touch” aortic technique, where such showers are not seen.

At the time of our study, it was not our routine practice in Oxford to use arterial line filters. We now do so, although evidence for this is still not compelling. Others have reported an abundance of microemboli during cardiopulmonary bypass despite the use of 40- μ m arterial filtration,¹ and leukocyte-depleting arterial line filters have reportedly failed to improve neurocognitive outcome.² On the other hand, the use of a cell saver in place of cardiotomy suction can potentially reduce the number of lipid microemboli. Although a combination of these techniques is likely to reduce microembolization during cardiopulmo-

nary bypass, it is still unlikely to reach the levels seen in off-pump surgery with a “no touch” aortic technique.

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The answer is an intra-aortic balloon pump

To the Editor:

We have presented an article¹ in the *Journal* with a case of wrong anastomosis of the left internal thoracic artery (LITA) with the cardiac vein that could not be detected with transit flow measurement. The LITA graft anastomosed with the cardiac vein demonstrated biphasic and diastolic-dominant flow, forming a trapezoid-shaped waveform, which was quite similar to the flow of the patent LITA graft to the left coronary artery.

Readers may not be able to understand why the arteriovenous flow pattern was similar to the arterioarterial flow pattern in this patient, because we did not discuss the mechanism that caused this similarity. In addition, readers may think that this similarity in flow pattern between the arteriovenous graft and the arterioarterial graft supports the idea of selective arterialization of the coronary venous system for patients with severe diffuse coronary artery disease.²⁻⁴ More recently, this idea has been expanded to the concept of percutaneous in situ coronary venous arterialization.⁵

The answer for this is the use of the intra-aortic balloon pump (IABP) in our patient. We have been applying prophylactic and preincision IABP aggressively to patients undergoing coronary artery bypass grafting. The IABP-induced diastolic flow augmentation of the incorrect LITA graft may result in the trapezoid-shaped waveform in transit flow measurement. Unfortunately, we did not record the waveform of the graft without IABP counterpulsation in this patient. We need further investigation of the flow pattern of the graft to the

coronary vein without IABP counterpulsation.

Our article¹ does not support the idea of coronary venous arterialization. We did not ligate the cardiac vein distally to isolate the arterialized venous system from the rest of the venous anatomy and to prevent steal through the coronary sinus to the right atrium, as is performed in surgical or percutaneous arterialization of the coronary venous system. However, even in the presence of the steal to the right atrium, the flow pattern of the arteriovenous graft we demonstrated may give the readers some suggestions regarding the physiology of the arterialized coronary venous system.

To be exact, the main finding of our article¹ is that it is impossible to detect incorrect grafting of the LITA to the coronary vein by flow waveform analysis with the transit time flow measurement under IABP counterpulsation.

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Difficulty of early diagnosis in patients with solitary pulmonary nodule

To the Editor:

We would like to express our opinion about the article by Crestanello and associates.¹ First, we congratulate them for the well-performed study contributing to the early diagnosis of lung cancer. Because an early diagnosis is likely to lead

to better survival, it is necessary to find a useful, easy, low-cost method to obtain better survival in patients with non-small cell lung cancer. But the results of this study seem to indicate that low-dose computed tomography (CT) screening is not the gold standard to obtain an early diagnosis. Low-dose CT screening in a well-selected group of patients detects a large number of indeterminate pulmonary nodules, but the diagnosis is not always made in the early stage; 7 patients (14.5%) had advanced lung cancer in stage IIIA or greater. These patients had a late diagnosis, despite an excellent treatment algorithm and a retrospective analysis of previous thorax CT. The percentage of patients with advanced lung cancer is very high for a well-selected group of patients, how is relatively high (39%) the percentage of benign nodules submitted to surgical operation.² Discussants emphasized that the main problem remains in detecting nodules less than 1 cm in diameter, whereas fortunately no discussion is necessary on the detection of nodules larger than 2 cm.

What is meant by the authors' statement, "morphologic appearance worrisome for cancer"?

Did the authors consider ground-glass opacity or other CT pattern? In their study, did the authors investigate the presence of ground-glass opacity³ in nodules less than 1 cm in diameter? Some recent studies have established a correlation between this CT pattern and the possibility of a malignant pulmonary nodule. If they studied this pattern, was the correlation observed in 37 nodules less than 1 cm in diameter in the patients enrolled in their study?

Last, what do the authors think about a computer-aided diagnosis and serial CT scan? These 2 methods have been proposed to distinguish between benign and malignant nodules.^{4,5} The computer-aided program can predict the histology of solitary pulmonary nodules by means of a simple chest x-ray film, whereas the serial CT scan algorithm enables volumetric modeling and may permit accurate assessment of doubling time over a relatively short period (20 days).

In conclusion, we believe that low-dose CT alone is not adequate to screen for solitary pulmonary nodules because it is possible to miss an early diagnosis and

difficult to differentiate between malignant and benign nodules.

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Reply to the Editor:

We appreciate Sortini and colleagues' comments concerning our report regarding surgical intervention in patients enrolled in a computed tomography (CT) screening trial. The radiographic finding in nodules that we considered worrisome for cancer include spiculation, noncalcification, diameter greater than 7 mm, and enlargement on serial examination.

The question about ground-glass opacities observed on CT is important. Our current policy is to carefully observe ground-glass opacities that are less than 7.0 mm in diameter. If they enlarge, we would either perform a percutaneous needle biopsy or thoracoscopic wedge resection of the nodule to establish a histologic diagnosis.

Our report included 16 patients in the surgical group with ground-glass opacities. Six of these patients had nodules that were