small, reflect the early stages and the pathogenesis of fatal human cases.

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Use of autologous adult stem cell for treatment of congestive heart failure To the Editor:

I read the article by Patel entitled "Surgical treatment for congestive heart failure with autologous adult stem cell transplantation: A prospective randomized study" with great interest.¹⁻⁴ Clearly the authors have demonstrated the effectiveness of injected autologous bone marrow stem cells to improve the functional capacity of the failing heart.³⁻⁵ In this clinical study they had the opportunity to take biopsy specimens of myocardium at the injection sites, but the nature of the cell findings are not reported.

Did the biopsy specimens show the CD34 marker?

Because no information is available in regard to the presence of fibroblasts or scar tissue, would it be possible that these tissues are transforming through dedifferentiation into myocardial tissue instead of stem cell transformation? The implication of this concept will allow investigators to concen-

trate more on the transduction signal pathway rather than stem cells alone.

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Positron emission tomographic scanning in the diagnosis and staging of non-small cell lung cancer 2 cm in size or less To the Editor:

We read with interest the publication by Port and colleagues.¹ In fact, there is little information in the literature on the role of positron emission tomography (PET) in assessing lung lesions of this size range for malignancy, and well-defined studies are needed. However, the current publication has several shortcomings.

Most importantly, standard uptake value (SUV) should not have been used to assess the lung lesions for malignancy. SUV is a semiquantitative measure of the tracer uptake in the region of interest, which normalizes the lesion activity to the injected dose and body weight; SUV does not have a unit. Despite initial enthusiasm, it is generally accepted that SUV should not be used to differentiate malignant from benign processes and that the visual interpretation of PET studies by an experienced reader provides the highest accuracy in diagnosing malignancy.²⁻⁵ There are many factors influencing the calculation of SUV, such as

the body weight and composition, the time between tracer injection and image acquisition, the spatial resolution of the PET scanner, and the image reconstruction algorithm. The clinical role of SUV in therapy monitoring and as a measure of tumor aggressiveness is currently under investigation.

Furthermore, the intensity of malignant lesions on PET is influenced by the location in the body. During PET acquisition, which takes several minutes, lung lesions move up and down, and their effective acquisition time is reduced. Therefore the fluorodeoxyglucose avidity of small lung lesions is often underestimated. Consequently, it is justified to use a "sensitive reading" and consider tumors of mild intensity to be malignant, although this likely reduces the specificity. Additionally, the non-attenuation-corrected (NAC) images should be reviewed while dealing with small lung lesions. Considering the mildly intense appearance of small malignant lung lesions on PET, it is reasonable to use the NAC images and compare the tumor uptake with the surrounding normal lung tissue and not with the mediastinal blood pool activity, as is the case while reading the attenuation-corrected (AC) images. Although large and markedly intense malignant foci would likely be recognized on both NAC and AC images, this might not be the case for small foci. Also, the pathophysiologic basis of fluorodeoxyglucose PET rests on increased expression of Glut, upregulation of hexokinase activity, and downregulation of glucose-6-phosphatase activity in the cancer cells compared with the normal cells of the same organ, the lung in this case.

In our experience PET can be very helpful in detecting malignancy in lung lesions measuring 6 to 10 mm, provided the images are read with attention to the issues mentioned (NAC images, sensitive reading, and avoidance of SUV thresholds). Sensitivity and specificity of PET for detecting malignancy in small lung lesions (6-10 mm) is currently being evaluated by us in an ongoing prospective study.

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Reply to the Editor:

We thank Drs Khandani and Detterbeck for their insightful comments on our article. Its main conclusion was that standard uptake values (SUVs) obtained from positron emission tomographic (PET) imaging were not useful for staging lung cancers smaller than 2 cm. We note that there was no disagreement with that conclusion, but rather the suggestion that visual inspection by experienced readers is now the accepted standard. A listing of some of the technical reasons why SUVs can be misleading is then given.

We agree that several recent articles have suggested that an expert reading may be equivalent to or better than a single cutoff for SUV. However, this is by no means a generally accepted standard. In fact, clinicians overwhelmingly continue to use the maximum SUV for differentiating benign from malignant lesions. This clinical practice is influenced by early PET reports,¹ in which a remarkably high accuracy of SUV was reported for differentiating benign from malignant nodules.

The problems outlined by Drs Khandani and Detterbeck regarding the limitations of the maximum SUV also affect the capability of experienced clinicians in making evaluations. Ultimately, anything that limits the ability to make quantitative assessments will also affect semiquantitative or nonquantitative assessments as well. The latest efforts in PET imaging include adding some form of gating to improve quantitative assessments, and likely there will

again be discussion of whether this will become the new accepted standard. For now, the maximum SUV continues to be reported and to guide clinical practice. We look forward to improvements in PET technology and remain hopeful that the utility of PET for small lesions will improve; however, there are some fundamental limitations that we believe will continue to be problematic in the foreseeable future.

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Pulmonary lobectomy for cancer in patients with chronic obstructive pulmonary disease

To the Editor:

We have read with interest the report from Baldi and colleagues¹ reporting their experience with pulmonary lobectomy for lung cancer in patients with chronic obstructive pulmonary disease (COPD).¹ On the basis of their retrospective evaluation of 137 patients, they concluded that patients with mild-to-severe COPD could have a better late preservation of pulmonary function after lobectomy than healthy patients. As discussed in a very precise way by the authors, this fact is related to a general improvement of the airway caliber and elastic recoil that could be, in its turn, related to relief of hyperinflation, chest wall mechanics, or both, even if in the nonemphysematous lung. In addition, resection of dead space could have its role.

We would like to briefly comment on these figures, trying to relate them to the possible role a pulmonary rehabilitation (PR) program might have in this kind of surgical population, and kindly ask for the authors to disclose their point of view according to their experience.

Today there is body of evidence regarding the efficacy of PR in the comprehensive management of patients with respiratory

disease, and PR programs are practiced worldwide.² Positive results in terms of improvement in dyspnea, exercise capacity, and quality of life are recognized in chronic obstructive and nonobstructive pulmonary disease, including COPD, cystic fibrosis, and restrictive thoracic disease.^{3,4}

Our group has a timely established interest in the issue of PR applied to patients who have undergone (or are candidates for) resection for lung cancer, and we have reported evidence that patients who underwent PR after pulmonary resection demonstrated a better improvement than those who, at discharge from the surgical unit, did not attend any postoperative rehabilitation protocol. In fact, we have reported that an early postoperative rehabilitative intervention prevents deterioration and speeds up recovery of function, with direct effects on ventilatory, gas exchange, and hemodynamic parameters (work of breathing, lung compliance, alveolar-arterial difference, maximum oxygen consumption, arterial oxygen tension, heart rate, arterial lactate concentration, cardiac index, and pulmonary artery pressure) and little or no significant effect on static and dynamic lung volumes, according to previously outlined experiences.⁵ Further analysis (data submitted for publication) of our experience supports this evidence. Because it appears that only patients with mild-to-severe COPD obtain an improvement in terms of lung volumes (related to the preoperative COPD index also)¹ from the removal of lung parenchyma associated with resection for cancer, we would like the authors to comment on the fact that a postoperative rehabilitation program adopted in these patients could improve ventilatory, hemodynamic, and gas exchange parameters concurring to a better clinical outcome and quality of life status.

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