

Correspondence

Rate of Complications in Immunocompromised Patients and Unexpectedly High Proportion of Zygomycetes in Computed Tomography–Guided Percutaneous Lung Biopsy Specimens

TO THE EDITOR—We read with great interest the article by Lass-Flörl et al. [1] about the utility of examination of CT-guided lung biopsy specimens for diagnosis of invasive fungal infection in immunocompromised patients. For greater appreciation and to generalize the article's findings, some issues need additional clarification.

First, CT-guided transthoracic needle biopsy of the lung has become a common procedure to elucidate the nature of pulmonary nodules [2]. The diagnostic performance of this procedure for tumors depends on the size, location, and radiologic and histologic characteristics of the lesion, and the procedure is reported to have high sensitivity and specificity for malignancy [3]. At present, studies of the diagnostic accuracy of this approach are scarce in the context of invasive pulmonary mycosis.

The technique is reported to have a considerable rate of complications in several reports, and we have some concern regarding potentially severe complications in the studied population. Although pneumothorax is reported to occur in 8%–60% of patients, it seldom requires drainage (1%–13% of patients) among persons who present with pulmonary nodules [4–6]. Use of a thoracic tube to treat pneumothorax in immunocompromised patients may constitute an important risk factor for infection. Major hemorrhage, which is considered to be a very rare adverse event following CT-guided needle biopsy, may also constitute a relevant hazard in invasive pulmonary aspergillosis.

Patients with hematologic malignancies and invasive pulmonary mycosis have an increased risk of developing bleeding complications due to both thrombocytopenia and hypervascularization of the lesion. Therefore, it would be of great interest to have additional detailed data about the rate of complications in the described immunocompromised population.

Second, thrombocytopenia is common in patients with hematologic malignancies. The described technique is contraindicated for patients with platelet counts <50,000 platelets/mL. We are concerned that there was no information about platelet counts and transfusion. In our opinion, Lass-Flörl et al. [1] should have provided the percentage of patients with hematologic malignancies for whom this diagnostic approach would have been contraindicated and who required platelet transfusion.

Third, the authors documented an unexpectedly high proportion of patients with Zygomycetes infection (13 [21.3%] of 61 patients). This finding is of great concern and could have major consequences in clinical practice, because drugs that are commonly used for these patients (e.g., voriconazole and echinocandins) are not effective against these fungi. Therefore, we asked ourselves whether the high rates of Zygomycetes infection observed by the authors could be associated with local epidemiologic features, prophylactic regimens, and/or greater diagnostic accuracy of their approach. The generally observed increase in the rate of zygomycosis seems to be associated with the type of prophylaxis administered [7, 8], as reflected by the relationship between the use of voriconazole prophylaxis and the increased frequency of zygomycosis documented in several recent reports [9, 10]. Additional information on local, specific

fungal epidemiology, the prophylactic regimens used for solid-organ transplant recipients, and hematologic malignancies in the studied population should have been provided to clarify the high rate of Zygomycetes infection.

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Reply to Garzoni and Dumont

TO THE EDITOR—We thank Garzoni and Dumont [1] for their correspondence and appreciate their interest in our study regarding the value of CT-guided percutaneous lung biopsies [2] for diagnosis of fungal infection.

Invasive fungal infection is a major cause of morbidity and mortality in immunosuppressed patients. Case-fatality rates range from 30% to 80% among neutropenic patients, and deaths result, at least in part, from difficulties in obtaining a reliable diagnosis [3]. However, only an accurate diagnosis allows for a specific therapy directed against the cause of the infiltrates, allows elimination of unnecessary and potentially toxic antimicrobial agents, and facilitates a more rational approach to the treatment of these critically ill patients. Tissue samples represent the most satisfactory specimens for use in diagnosis of invasive fungal infection [4]. Thus far, there has been no doubt that performance of CT-guided percutaneous lung biopsy in immunocompromised patients is a risk for potential complications. Contraindications, such as pulmonary hemorrhage with hemoptysis and infection, may account for these risks [5]. In our cohort of 61 patients, there were no emergencies that required treatment of hemoptysis, although 1 patient experienced pneumothorax requiring chest tube placement. The timing of lung biopsy depended on the patient's condition. The interval from radiologic diagnosis to biopsy inter-

vention was 9 days (range, 4–22 days). Biopsy specimens were not obtained during severe neutropenia (absolute neutrophil count, <500 cells/ μ L) or thrombocytopenia (platelet count, <50,000 platelets/ μ L). Five patients received platelet transfusions.

Zygomycetes infections are non-*Aspergillus* mold infections and are important causes of morbidity and mortality among immunocompromised patients [6]. An alarming increase in the number of case reports of zygomycosis have been noted among patients with cancer over the past decade [7]. However, center-to-center differences occur, and there is a lack of knowledge regarding the reasons for this epidemiologic shift. One proposed predisposing factor is the widespread use of voriconazole as prophylaxis for patients who have hematologic malignancies or who have undergone hematopoietic stem cell transplantation. Conversely, some researchers have suggested that the association is not causative but rather a reflection of changes in the host's immune constitution or time at risk while receiving immunosuppressive drugs [8]. In our health care center, prophylaxis and treatment strategies accord with international guidelines and recommendations [9, 10]. Patients who have hematologic malignancies and/or who have undergone allogeneic or autologous stem cell transplantation received standard prophylaxis with fluconazole (400 mg/day). For empirical, preemptive treatment of invasive fungal infection, therapy was switched to either a lipid formulation of amphotericin B or voriconazole. Overall, the rate of infection due to Zygomycetes increased in our hospital, as well as in other health care centers, indicating the necessity for a powerful means of diagnosis to reduce the high mortality for this condition.

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