

The role of percutaneous interventions in the management of lung cancer patients during the Covid-19 pandemic

To the Editor

We would like to thank Dr. Gorospe and his colleagues from the Ramón y Cajal University Hospital in Madrid, Spain for their interest and commentary and for also sharing their own experience in managing lung cancer patients during the Covid-19 pandemic. As mentioned in our original article, physicians and surgeons worldwide are being forced to make significant management adjustments so as to continue providing the best possible, given the limitations imposed by the pandemic, medical care to lung cancer patients during this difficult period.¹ These necessary changes have created significant ethical dilemmas and angst amongst all of us regarding the management decisions we are currently making and how they will affect our lung cancer patients' prognosis in the future. Like Dr. Gorospe's team, which so eloquently described their experience performing a percutaneous image guided biopsy in a SARS-CoV-2 positive patient with an undiagnosed lung mass, we also have utilized interventional radiology to a greater extent than previously, to provide both diagnostic but also therapeutic interventions to our lung cancer patients. Because "cancer doesn't stop for anything", thoracic surgeons and oncologists have to continue relying on interventional radiologists to perform diagnostic procedures and biopsies in newly presenting lung cancer patients even during the pandemic. As described in our report following multidisciplinary oncological council assessment patients which were deemed too high risk to undergo surgery at this time, were as per agreed upon protocol usually referred for induction chemotherapy to be followed by resection at a safer time period.¹ However, for a number of high risk patients imaging-guided percutaneous ablation provides a valuable alternative. The benefit offered by interventional radiology procedures during the pandemic is that because they can be performed as day-cases or require only an overnight hospitalization for observation, the exposure risk is much lower than surgery.

The established clinical indications for percutaneous ablation in non-small cell lung cancer (NSCLC) patients includes medically inoperable patients with early stage disease, painful rib metastasis, relapse in a previously irradiated field and chest wall invasion.^{2,3} Additionally, percutaneous ablation may be used as an adjunctive therapy for large-sized tumors not suitable for radiation therapy alone, as salvage therapy for stage III and IV recurrences within a previously irradiated field and as palliative therapy aiming in pain reduction and control and improvement of quality of life in symptomatic chest wall recurrence.⁴⁻⁶ Percutaneous image-guided ablation of NSCLC can serve as a single session, minimally invasive

alternative with minimum impact on pulmonary function in high surgical risk or medically inoperable stage Ia NSCLC patients. The technique has 2 year survival rates which favorably compare to that of other therapies; in the ACOSOG Z4033 trial, 54 medically inoperable NSCLC patients were enrolled and underwent percutaneous radio-frequency ablation resulting in a 2 year survival rate of 70%.⁷ Percutaneous ablation of NSCLC is included under restrictive criteria in international oncological guidelines with ideal candidates being stage I NSCLC patients with cardiorespiratory comorbidity or insufficient vital lung reserve rendering surgery or stereotactic body radiotherapy a contraindication.⁸⁻¹⁰

Lung cancer care during the pandemic requires multifactorial assessment. Any clinical decision should be weighted on the basis of individual patient risk taking as an additional account the pandemic curve in the specific geographic location. Factors such as performance status, immune response capabilities, disease biology and specific tumor progression behavior determine the individual patient risk whilst the hospital's infections committee in accordance with the guidelines provided by public health authorities will approve all precautionary measures. In addition to the multidisciplinary oncological council assessment, patients and family should consent to any decision made. During the consent the clinician should communicate that patients' benefit is placed first and foremost despite the pandemic and that all precautionary measures are taken to provide them with the best possible cancer care at a minimum risk.

It is established that patients undergoing lung resection constitute a high risk group for SARS-CoV-2 infection.¹¹ Under this perspective, percutaneous image-guided lung ablation being less invasive and performed as a single session with equivalent outcomes can serve as an attractive alternative (to resection or multiple fraction stereotactic body radiotherapy) intervention in high risk lung cancer patients.

Naturally, the Covid-19 pandemic has introduced a number of modifications in the performance of routine interventional radiology procedures in the lung because they are considered high aerosol generating interventions. In accordance to local and international guidelines we have produced a management protocol for performing percutaneous image-guided lung biopsies and ablation procedures in our hospital.¹² According to this protocol, patients referred for lung ablation are initially assessed via telephone consultation for suitability and also screened for signs and symptoms of infection. Patients present to a designated admissions area accompanied by a single caregiver wearing masks and all are required to wash/sanitize

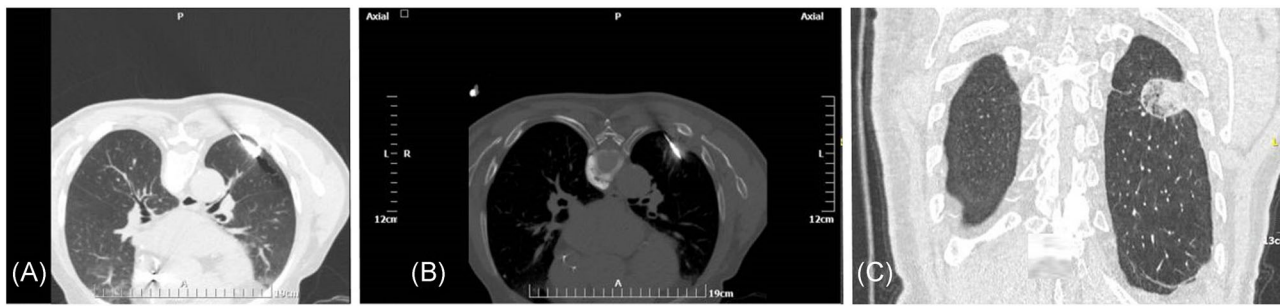


FIGURE 1 A biopsy proven NSCLC 81-year-old male patient which due to significant co-morbidities had in increased risk during this period underwent percutaneous computed tomography guided microwave ablation. A,B, Computed Tomography (CT) axial scans in lung (A) and chest (B) window illustrating the microwave antenna inside the lesion. C, CT coronal reconstruction one month post the percutaneous ablation session illustrating the ground glass infiltrate covering the whole lesion with satisfactory safety margins. NSCLC, non-small cell lung cancer

their hands. As part of the admission procedure point-of-care laboratory testing for SARS-COV-2 virus with nucleic acid amplification analysis is performed.

Workflow and routes of transport were re-organized so as to minimize the number of instances of contact between providers, staff and patients while maintaining procedural safety, efficacy and a comfortable patient experience.¹² Staff exposure is minimized by utilizing the minimum amount of required staff for performing the procedure. This includes a radiographer controller, a circulating nurse and two physicians, the primary operator and his assistant, who are designated to performing such procedures. To minimize the length of the procedure, the assistant is usually another specialist or a senior fellow and despite ours being an academic facility, educational and training has to be curtailed. Standard personal protection equipment precautions are utilized; with a properly fitted respirator or N95 mask, eye protection (goggles or face shield), disposable surgical gown and gloves utilized by the physicians and the circulating nurse (minus the surgical gown), while the technologist despite remaining isolated in the control room also uses a surgical mask. At the conclusion of the procedure patients remain in an isolated observation area or transferred for an overnight stay in a “clean” ward. Only a single caregiver is allowed and long periods of presence are discouraged. Appropriate distancing is practiced to the extent possible and only electronic communication with family members or caregivers is recommended. Consequently, adherence to this protocol has allowed us also to perform a number of interventional radiology procedures in lung cancer patients during the pandemic safely and successfully (Figure 1).

In conclusion, for many physicians the changes imposed upon our practice reality by the Covid-19 pandemic has become a source of great distress, anxiety and angst. However, we have found solace pondering on the words of the famous Cretan novelist Nikos Kazantzakis: “Since we cannot change reality, let us then change the eyes with which we see reality”.

CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

AUTHOR CONTRIBUTIONS

EIK and DKF came up with the original concept idea and outline, reviewed the pertinent literature and wrote the manuscript together. IPT, AK, AK, and PIT provided guidance and advice as needed and edited the manuscript. The authors are all members of the multi-disciplinary team providing lung cancer care at our hospital.

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