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COMMENTARY

Upstaging of Lung Cancer and Waiting Times for Surgery

Andrew Cochrane, MBBS, FRACS [a,b*], John M. Alvarez, MBBS, FRACS [c]

[a]Department of Cardiothoracic Surgery, Monash Medical Centre, Melbourne, Vic, Australia
[b]Department of Surgery, Monash University, Melbourne, Vic, Australia
[c]University of Western Australia, WA, Australia

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The management of lung cancer has undergone a number of advances in the last decade, including routine position emission tomography (PET) scanning and endobronchial ultrasound (EBUS) to improve the accuracy of the workup, minimally invasive video-assisted thoracoscopic surgery (VATS) to reduce the size of the surgical incision and improve the recovery from surgery, and the use of stereotactic ablative radiotherapy (SABR) as a competitor for surgery. In addition, there are exciting advances taking place in the immunotherapy of lung cancer with the new group of checkpoint inhibitor drugs, both for advanced disease and as preoperative and perioperative therapy for early disease. Non small cell lung cancer (NSCLC) remains a major cause of cancer-related death, and surgical resection is still the most effectiive method of treating early stage NSCLC.

In this issue of *Heart, Lung and Circulation*, Verma et al. present a small cohort of patients and report that the avidity of lung adenocarcinoma, as measured by the standardised uptake value (SUV max), is associated with a higher rate of pathologic upstaging, with more advanced disease at operation and on the pathologic examination than seen on the preoperative investigations [1]. The authors reported on 153 patients diagnosed and operated over a 4-year period at the Royal Adelaide Hospital, South Australia, Australia, with upstaging in 64 patients (42% of the total group). This upstaging included more advanced tumour findings, mediastinal node disease, pleural disease and chest wall invasion. Their finding that the tumour avidity measured by the SUV max correlated with more rapid progression of disease is an interesting finding and warrants further research.

The paper raises several issues. Firstly, the study is quite small, and comes from a single centre. The predominant lesion was adenocarcinoma, in 60% of patients, and there was a significantly higher SUV max score in the patients who were upstaged compared with those who had no difference between the clinical and the pathologic staging. For squamous carcinoma, present in 40%, which had higher SUV max scores in general, there was a trend with a potentially important difference in the SUV max score, but this was not statistically significant. This reinforces the small size of the study, and the need for larger studies to try and confirm this reported finding.

Secondly, although the authors claim that surgical waiting time did not appear to be a significant predictor for upstaging, the waiting times from PET scan to surgery are quite long, with mean times between 53 and 71 days, and with quite large standard errors indicating a wide distribution of times. In the current era, an average of 2 months from PET scan and staging to surgical resection is an excessive time, since up to 50% of patients were waiting longer than 2 months, and this does at least partially explain the high overall rate of upstaging at 42% for the whole group. In many units, a patient coming to surgery with a PET scan older than 6 weeks (approx. 40 days) would have a repeat scan performed preoperatively for exactly this reason — that the disease may have progressed.

Lung cancer has a doubling time reported by different sources between 45 and over 200 days. However while the doubling time may be consistent, the actual volume of tumour shows exponential growth, and the growth therefore

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*Corresponding author at: Department of Cardiothoracic Surgery, Monash Medical Centre, 246 Clayton Road, Clayton, VIC 3168, Australia., Email: Andrew.Cochrane@monashhealth.org

appears to become more rapid because of the number of cells already in existence.

Everitt [2] demonstrated in serial PET scans with a median interval of 24 days that there was progression of disease in 36% of the patients. Their paper provides a graph which estimates the probability of upstaging after any particular interval, and they predict upstaging as high as 60% at 2 months, consistent with the findings of this study.

Eastham et al [3] using tumour volume calculated from PET scan showed on average a 50% increase in volume during a mean waiting time of 33 days between PET scan done for staging and for radiotherapy.

Bott et al [4] undertook an analysis of over 55,000 patients in the U.S. National Cancer Database, and showed that a delay over 8 weeks was a risk factor for upstaging.

The reasons for the long waiting time for access to surgery are not explored in this paper, and are not the focus of the study, but do emphasise the importance of timely access to surgical care (as well as radiotherapy and oncology care) for lung cancer patients. The prognosis for lung cancer detected at an early stage has improved significantly over the last couple of decades, and early surgery can often provide a cure. As we move towards an era when screening for lung cancer is likely to be widely adopted, the hospital system will need to be able to respond in an appropriate time or the effort and expense involved in screening will be wasted.

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