

# **The association between postoperative analgesic technique and long-term patient outcomes following surgical resection of lung cancer: A retrospective analysis**

D Moran, B Shelley

*School of Medicine, University of Glasgow, UK*

## **Introduction**

Lung cancer is the third most common cancer in the UK, and incidence is particularly high in Scotland<sup>(1)</sup>. Surgical lung resection remains the recommended treatment for localised disease, and this commonly involves an open thoracotomy. Post-thoracotomy pain is predominantly managed using regional analgesic techniques (Epidural or Paravertebral blocks) and/or systemic opiates. It is becoming increasingly recognised that opioid analgesics may promote cancer recurrence<sup>(2)</sup>. It has therefore been hypothesised that opioid-sparing regional techniques may be associated with lower recurrence and longer survival.<sup>(2)</sup>

The aim of this study was to compare survival time between patients who received an Epidural block with no additional systemic opiates, and those who received a Paravertebral block with IV Morphine PCA.

## **Methods**

This was a retrospective cohort study based at the Golden Jubilee National Hospital. Patients were included in the study if they had a diagnosis of Stage 1-3 non-small cell lung cancer (NSCLC) and had undergone open lung resection surgery between January 2010 and December 2014. Surgical and analgesic data for each patient was electronically merged with lung cancer records from the Scottish Cancer Registry.

Primary outcome was time to lung cancer-related mortality and secondary outcome was time to all-cause mortality. These endpoints were assessed by performing a Kaplan-Meier survival analysis; in addition to Univariate and Multivariate Cox Proportional Hazards Regression.

## **Results**

A total of 626 patients were included in the final statistical analysis and mean follow-up time was 3.6 years. 72.8% (n=456) of patients received an Epidural and 27.2% (n=170) received a Paravertebral block with IV morphine PCA. The two groups were similar at baseline, apart from Year of Surgery, Procedure type, SIMD quintile and Chemotherapy.

In the Kaplan-Meier analysis, no difference in survival time was observed between the groups, for either lung cancer-related mortality (p=0.116) or all-cause mortality (p=0.216). [Figure 1]

In the Multivariate Cox Proportional Hazards regression, older age at surgery, radiotherapy treatment, advanced cancer stage and earlier year of surgery were predictive of shorter survival

time. Analgesic technique was not found to be significantly associated with either time to lung cancer-related mortality ( $p=0.295$ ) or time to all-cause mortality ( $p=0.333$ ).

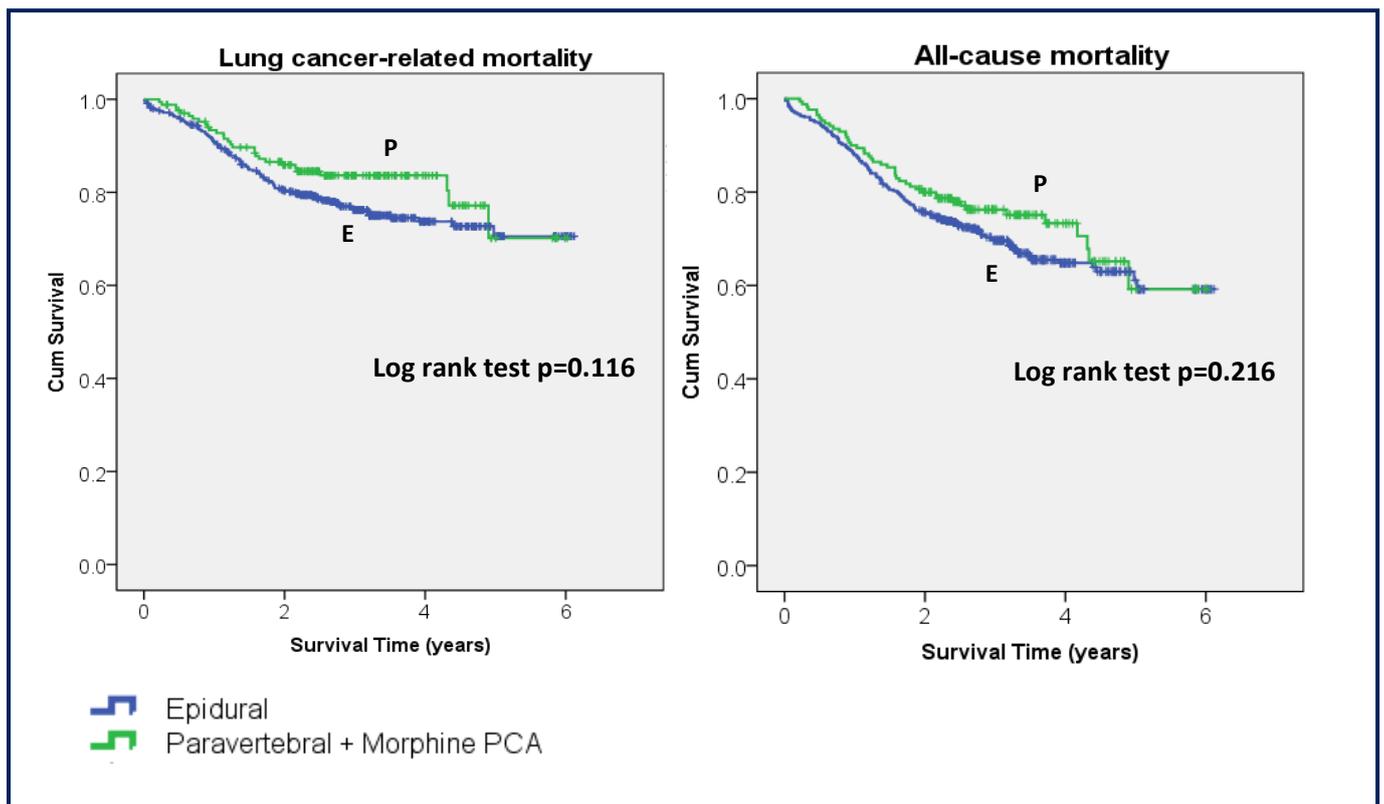
### Discussion

In this cohort of surgical NSCLC patients, it was observed that postoperative analgesic technique had no significant influence on survival time. Although the Log-rank test values were not significant, the appearance of the survival curves suggest that a Paravertebral block may initially be associated with longer survival, before becoming comparable to an Epidural after ~5 years.

The lack of significance in the data may be because both groups received regional analgesia. The associated benefits of this technique may have outweighed the potential negative effects of IV PCA morphine in the Paravertebral group.

A key strength of the study is its large size, whilst its retrospective design is a limitation. There is also a possibility that selection bias or unmeasured confounding variables may have influenced the results. These findings contribute to a large body of retrospective research which is currently conflicting. Future prospective studies are needed in order to definitively answer this important clinical question.

**Figure 1.** Results of the Kaplan Meier Survival Analysis



## **Acknowledgements**

Project funding was received from a National Institute of Academic Anaesthesia John Snow Intercalated BSc Award.

## **References**

- (1) **Cancer Research UK.** Lung cancer incidence statistics. [Online] 2016  
<http://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/lung-cancer/incidence#ref-0>.
- (2) **Day, A, Smith, R, Jourdan, I et al.** Retrospective analysis of the effect of postoperative analgesia on survival in patients after laparoscopic resection of colorectal cancer. *BJA*. 2012. 109;2:185-90