**Determinants of Success in EGFR Mutation Status Analysis in EBUS-TBNA Specimens: The Role of PET-CT**

**Top Author:** Alvin Hon Man Tung  
*Department of Medicine and Therapeutics, Prince of Wales Hospital, Hong Kong*  
*Hong Kong*

---

**Objectives:** Endobronchial Ultrasound guided Transbronchial Needle Aspiration (EBUS-TBNA) is useful in obtaining Epidermal Growth Factor Receptor (EGFR) mutation status in patients with advanced Non-Small Cell Lung Cancer (NSCLC), but determinants of successful EGFR mutation status analysis remained unknown.

**Methods:** We retrospectively reviewed case files from patients undergoing EBUS-TBNA in our Division to search for determinants of success in obtaining EGFR mutation status.

**Results:** 93 patients undergoing EBUS-TBNA were identified between January 2012 and March 2013. Of these, 58 were diagnosed with NSCLC and 14 patients had PET-CT performed with SUV data available. Twenty-seven (46.55%) underwent testing for EGFR mutation status, with 12 patients tested positive and 6 rejected. Our yield was 78% with an EGFR mutation rate of 57%. Bivariate correlation analysis showed that females (r=0.523, p=0.015), never smokers or light smokers (r=0.523, p=0.015) were the predictors of EGFR mutation status. Lesion sizes, number of passes, FEV1, duration of procedure and SUV on PET-CT were not correlated to EGFR mutation status. For the predictors of success in EGFR testing, number of passes (r=-0.463, p=0.015) and SUV on PET-CT (r=0.635, p=0.02) were the only predictors of success in EGFR testing. Receiver Operations Characteristics (ROC) curve (Figure) showed that with a SUV cut-off of 9.6 or more conferred a sensitivity of 66.7% with a specificity of 80%, with an AUC of 0.933 (95% CI 0.782-1.084, p=0.028) in predicting rejection in EGFR testing for mutation status.

**Conclusion:** In our Chinese cohort of advanced NSCLC with mediastinal nodal involvement, we were unable to demonstrate an effect of SUV on PET-CT scans and EGFR mutation status, although we showed that patients with high SUV (>9.6) could predict inadequacy of cellular material in obtaining EGFR status in EBUS-TBNA samples. Furthermore, the number of EBUS-TBNA passes also predicts success in EGFR testing.
ROC Curve for predictor of SUV in predicting rejection in EGFR mutation status