19. **Yang MH,** Wu KJ. TWIST activation by hypoxia inducible factor-1 (HIF-1): implications in metastasis and development. *Cell Cycle* 2008;**7**:2090–6.
20. **Elloul S,** Elstrand MB, Nesland JM, *et al*. Snail, Slug, and Smad-interacting protein 1 as novel parameters of disease aggressiveness in metastatic ovarian and breast carcinoma. *Cancer* 2005;**103**:1631–43.
21. **Moody SE,** Perez D, Pan TC, *et al*. The transcriptional repressor Snail promotes mammary tumor recurrence. *Cancer Cell* 2005;**8**:197–209.
22. **Yang MH,** Chang SY, Chiou SH, *et al*. Overexpression of NBS1 induces epithelial-mesenchymal transition and co-expression of NBS1 and Snail predicts metastasis of head and neck cancer. *Oncogene* 2007;**26**:1459–67.
23. **Yang J,** Mani S, Donaher J, *et al*. Twist, a master regulator of morphogenesis, plays an essential role in tumor metastasis. *Cell* 2004;**117**:927–39.
24. **Mironchik Y,** Winnard PT Jr, Vesuna F, *et al*. Twist overexpression induces in vivo angiogenesis and correlates with chromosomal instability in breast cancer. *Cancer Res* 2005;**65**:10801–9.
25. **Maxwell PH.** The HIF pathway in cancer. *Semin Cell Dev Biol* 2005;**16**:523–30.
26. **Semenza GL.** Targeting HIF-1 for cancer therapy. *Nat Rev Cancer* 2002;**2**:38–47.
27. **Rankin EB,** Giaccia AJ. The role of hypoxia-inducible factors in tumorigenesis. *Cell Death Differ* 2008;**15**:678–85.
28. **Giatromanolaki A,** Koukourakis MI, Sivridis E, *et al*. Relation of hypoxia inducible factor 1 alpha and 2 alpha in operable non-small cell lung cancer to angiogenic/molecular profile of tumours and survival. *Br J Cancer* 2001;**85**:881–90.
29. **Swinson DE,** Jones JL, Cox G, *et al*. Hypoxia-inducible factor-1 alpha in non-small cell lung cancer: relation to growth factor, protease and apoptosis pathways. *Int J Cancer* 2004;**111**:43–50.
30. **Yang MH,** Wu MZ, Chiou SH, *et al*. Direct regulation of TWIST by HIF-1alpha promotes metastasis. *Nat Cell Biol* 2008;**10**:295–305.
31. **Hung JJ,** Wang CY, Huang MH, *et al*. Prognostic factors in resected stage I non-small cell lung cancer with a diameter of 3 cm or less: visceral pleural invasion did not influence overall and disease-free survival. *J Thorac Cardiovasc Surg* 2007;**134**:638–43.
32. **Sobin LH,** Wittekind C. *International Union Against Cancer: TNM classification of malignant tumours*. 5th ed. New York: Wiley-Liss, 1997.
33. **Yang MH,** Chiang WC, Chou TY, *et al*. Increased NBS1 expression is a marker of aggressive head and neck cancer and overexpression of NBS1 contributes to transformation. *Clin Cancer Res* 2006;**12**:507–15.
34. **Winton TL,** Livingston R, Johnson D, *et al*. A prospective randomised trial of adjuvant vinorelbine (VIN) and cisplatin (CIS) in completely resected stage 1B and II non small cell lung cancer (NSCLC) Intergroup JBR. *J Clin Oncol* 2004;**22**:7018.
35. **Strauss GM,** Herndon JE 2nd, Maddaus MA, *et al*. Adjuvant paclitaxel plus carboplatin compared with observation in stage IB non-small-cell lung cancer: CALGB 9633 with the Cancer and Leukemia Group B, Radiation Therapy Oncology Group, and North Central Cancer Treatment Group Study Groups. *J Clin Oncol* 2008;**26**:5043–51.

Lung alert

Preoperative integrated PET-CT scanning reduces the number of futile thoracotomies for lung cancer

In this Danish trial, patients being assessed for surgery of early stage non-small cell lung cancer (NSCLC) were randomised to either conventional staging and PET-CT scanning or conventional staging alone. The number of futile thoracotomies in each arm is a measure of staging accuracy and was used as the primary outcome. A thoracotomy was deemed futile if any one of the following criteria was met: pathologically confirmed N2, N3, T4 or M1 disease, an exploratory thoracotomy, a benign lung lesion or a thoracotomy in a patient who developed recurrent disease or died within 1 year of randomisation.

Ninety-eight patients were allocated to the PET-CT arm and 91 to the conventional staging group between 2002 and 2007. Sixty patients undergoing PET-CT had a thoracotomy compared with 73 patients in the conventional staging group ($p = 0.004$). Despite the trial closing early due to slow accrual, PET-CT scanning resulted in a significantly lower number of futile thoracotomies: 21 (35%) in the PET-CT arm compared with 38 (52%) in the conventional staging arm ($p = 0.05$). For every five PET-CT scans, one futile thoracotomy was prevented. The intervention did not improve survival, although at closure the trial may not have been sufficiently powered to do so.

The trial confirms the importance of routine use of PET-CT scanning in the preoperative staging of NSCLC. However, even with the use of PET-CT, 35% of thoracotomies remained futile, emphasising the need for further progress in this area.

► Fischer B, Lassen U, Mortensen J, *et al*. Preoperative staging of lung cancer with combined PET-CT. *N Engl J Med* 2009;**361**:32–9.

Neal Navani

Correspondence to: Dr N Navani, MRC Clinical Research Training Fellow, Centre for Respiratory Research, University College London, London, UK; n.navani@ucl.ac.uk

Thorax 2009;**64**:1089. doi:10.1136/thx.2009.127407