For editorial comment see p. 218

Respiration 2016;92:283–284
DOI: 10.1159/000448763

Three-Year Follow-Up of a Patient with a Giant Bulla Treated by Bronchoscopic Intrabullous Autologous Blood Instillation

Samuel V. Kemp^a Zaid Zoumot^c Pallav L. Shah^{a, b}

^aThe National Institute for Health Research Unit, Royal Brompton and Harefield NHS Foundation Trust, and Imperial College, and

^bChelsea and Westminster Hospital NHS Foundation Trust, London, UK; ^cCleveland Clinic, Abu Dhabi, United Arab Emirates

Dramatic benefit can be achieved with the surgical treatment of giant bullous disease in emphysema, but not all patients are fit for, or want, surgery, and the process is not risk free. Beyond case reports [1–3], very little exists in the literature concerning the non-surgical treatment of this debilitating disease. Bronchoscopic intrabullous autologous blood instillation (BIABI) has been shown to reduce the size of giant bullae and provide medium-term ben-

efits to patients with COPD and giant bullous disease [4], but more long-term benefit from non-surgical (i.e. bronchoscopic) approaches has not previously been demonstrated. We report the persistence of benefit at nearly 3 years in a patient treated with BIABI, with sustained improvements in lung function, symptoms, and cross-sectional imaging.

A 56-year-old male ex-smoker with GOLD stage 3 COPD was assessed in the out-patient department and found to have emphysema with a significant bullous space in the left upper lobe on a CT scan. He was breathless and exercise limited (Medical Research Council dyspnoea score 3/5), with restrictions to activities of daily living and significant impairment to quality of life. The patient was deemed appropriate for bullectomy, but was not keen on surgery. He was therefore offered a trial of autologous blood instillation into the bullous space via bronchoscopy under fluoroscopic guidance, as described previously [4].

Cross-sectional imaging demonstrates almost complete resolution of the bullous space in the left upper lobe (fig. 1), and improvements in spirometry and lung volumes have persisted (table 1). There is perhaps a signal that progressive improvement is seen over many months or years after the procedure. This may be due to slow resorption of air in the bulla, although the mechanism of

Fig. 1. CT images before (a–c) and after (d–f) BIABI.

Table 1. Lung function test results

	02/08/13	10/01/14	13/03/15	28/04/16	Change
FEV ₁ , l	1.50	1.75	1.67	1.86	+0.36
FEV ₁ %	45	53		59	+14
FVC, l	2.55	3.20	3.14	3.53	+0.98
RV, l	4.27	3.49	3.22	3.71	-0.56
RV%	188	154	142	161	-27
RV/TLC	56.2	48.2	46.8	47.7	-8.5
ITGV, l	5.21	5.17	4.39	4.17	-1.05
TLCO%	81	74	86	83	+2

FEV₁ = Forced expiratory volume in 1 s; FVC = forced vital capacity; RV = residual volume; TLC = total lung capacity; ITGV = intrathoracic gas volume; TLCO = transfer factor for the lung for carbon monoxide.

action is not yet fully understood. Further studies are needed to assess the longer-term outcomes of this approach and the physiological mechanisms behind it, and ultimately a trial against traditional surgical approaches.

References

- 1 Sexton P, Garrett JE, Rankin N, Anderson G: Endoscopic lung volume reduction effectively treats acute respiratory failure secondary to bullous emphysema. *Respirology* 2010;15:1141–1145.
- 2 Bhattacharyya P, Sarkar D, Nag S, Ghosh S, Roychoudhury S: Trans-bronchial decompression of emphysematous bullae: a new therapeutic approach. *Eur Respir J* 2007;29:1003–1006.
- 3 Asai N, Ohkuni Y, Kaneko N: A case of giant bulla successfully treated by bronchoscopic lung volume reduction therapy. *J Bronchology Interv Pulmonol* 2014;21:101–102.
- 4 Zoumot Z, Kemp SV, Caneja C, Singh S, Shah PL: Bronchoscopic intra-bullous autologous blood instillation: a novel approach for the treatment of giant bullae. *Ann Thorac Surg* 2013;96:1488–1491.