A bleeding problem in lung cancer patients

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While severe haemoptysis is still a dreadful event in lung cancer patients a combined effort may evade imminent death <http://ow.ly/E3RbF>

“Death has a hundred hands and walks by a thousand ways”, stated T.S. Eliot [1]. In lung cancer patients, severe haemoptysis is arguably the most terrifying of these [2]. Although definitions of severe haemoptysis are somewhat variable, all refer to an amount and rate of bleeding from the respiratory tract that overwhelm the patient’s capacity to clear the airways of blood and sustain respiratory and haemodynamic stability, thus directly jeopardising survival [3]. The expectoration of quantities of blood exceeding 100–200 mL, which is a traumatic experience in itself, may lead to asphyxiation in the absence of prompt interventions to maintain a free airway, support ventilation and halt further bleeding. Towards these aims, a coordinated and streamlined effort by pulmonologists, emergency and critical care physicians, (interventional) radiologists, and thoracic surgeons is needed. However, when severe haemoptysis occurs in the context of a known pulmonary malignancy, it is usually seen as the harbinger of a grim prognosis [4, 5]. As such, physicians may doubt whether an aggressive pursuit of stabilisation, including airway intubation, mechanical ventilation, and a series of diagnostic and therapeutic interventions, is to be preferred instead of a mere relief of anxiety and distress by urgent sedation. Traditionally, lung cancer patients have been considered poor candidates for intensive care unit (ICU) admission in cases of life-threatening emergencies because of a perceived dismal outcome. However, with advances in oncological and supportive therapies in lung cancer patients, including those with nonresectable non-small cell lung cancer (NSCLC), increasing numbers of them are being referred to the ICU, and their survival has been improving [7, 8]. In a large, multinational study conducted in 2011, lung cancer patients accounted for 3.5% of all ICU admissions and their hospital survival was 61% [8]. As lung cancer patients are a relatively new category of ICU patients, treatment algorithms for guidance of diagnostics and empirical therapy are in the process of development [9]. No recent studies have provided details on cancer patients with haemoptysis as a reason for ICU referral. The report by RAZAZI *et al.* [10] on the characteristics and outcome of 125 NSCLC patients with severe haemoptysis treated in their tertiary referral centre in Paris, France, in this issue of *European Respiratory Journal* is, therefore, a significant addition to the literature.

In recent years, the use of multidetector computed tomography angiography to identify the focus of haemoptysis and of bronchial artery embolisation to achieve bleeding control have proven themselves as important additions to our diagnostic and therapeutic armamentarium. Beside fiberoptic bronchoscopy, these techniques now occupy a central place in treatment algorithms for severe haemoptysis [11–15]. These algorithms may serve as an excellent example of improved supportive care for cancer patients. In the current study, haemostatic control was achieved in 87% of patients, bronchial artery embolisation figuring

Received: Oct 28 2014 | Accepted: Oct 31 2014

Conflict of interest: None declared.

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prominently (performed in 81% of patients, successful in 71%) together with bronchoscopy (performed in 27% of patients, successful by itself in achieving haemostasis in 11%). Only a minority of cases proceeded to surgery when embolisation failed or pulmonary artery involvement was considered likely (14%). Evidently, this good performance may be due to the large experience of the team and cannot be generally extrapolated. It is important to note that in the multicentre study of ICU cancer patients by SOARES *et al.* [8], mortality was lower in high-volume centres.

Although the ability to achieve haemostasis is pivotal, it is only part of the total care of severe haemoptysis in the lung cancer patient. Severe haemoptysis may rapidly lead to acute respiratory failure due to central airway obstruction, atelectasis and alveolar flooding or, less frequently, hypovolaemic shock, requiring intubation, mechanical ventilation, volume resuscitation and blood transfusion. Initially successful stabilisation may be followed by complications associated with intubation and critical care, such as nosocomial infection, ventilator-associated events, transfusion-associated acute lung injury or neuromuscular weakness. Weaning from mechanical ventilation may be prolonged and difficult, and may leave the patient in a debilitated state [16, 17]. All of these problems downstream may be reflected by the odds ratio of 13 for in-hospital mortality associated with mechanical ventilation in the article by RAZAZI *et al.* [10]. Hospital survival rates in previously published series of mechanically ventilated cancer patients were ~30%. While this overall figure justifies mechanical ventilation as a viable treatment option in cancer patients, it is important to realise that survival rates were highly variable across subgroups and much lower in patients with poor performance status or tumour airway obstruction [6, 18, 19]. Embarking on a prolonged ICU trajectory may not benefit every patient with severe haemoptysis, as in some, it may prolong suffering rather than extend life. Previously, the same Paris tertiary centre reported on the outcome of 105 patients with lung cancer, mostly with advanced disease (>80% stage IIIB and IV NSCLC or extensive small cell lung cancer), admitted to the ICU for acute life-threatening illness [7]: in patients requiring mechanical ventilation, ICU survival was 57%. As two-thirds of ICU survivors could be treated with anticancer therapy afterwards and half of them were alive at 6 months, these encouraging results were, in our opinion, also indicative of careful selection of patients.

In daily practice, severe haemoptysis usually presents as an emergency with patients suffering from acute anxiety and distress, challenging the clinical skills of healthcare providers. In this acute setting, patient-shared and interdisciplinary decision-making may be difficult to organise. Immediate symptom control is mandatory in all instances. Unless patients are severely debilitated or have an advanced care plan precluding resuscitation, this may include sedation and intubation in addition to conservative measures. As such, time is bought to make up a diagnostic and therapeutic plan, which may include referral for urgent angiography and embolisation. Multidisciplinary consultation is essential and should incorporate the patient's oncological status, potential therapeutic options, performance status and quality of life, as well as patient's personal preferences (if known). This review should be repeated whenever a treatment step fails and further interventions become necessary, or when new complications from critical illness arise. As such, while severe haemoptysis is still a dreadful event in lung cancer patients, a combined effort may evade imminent death and offer some perspective for life beyond the bleeding event to a significant number of these patients.

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