Bronchopleural Fistula or Alveolopleural Fistula?

Not Just Semantics

To the Editor:

We read with interest the article by Feller-Kopman et al1 (July 2006), who report the use of an endobronchial valve for the treatment of persistent air leak. We congratulate the authors on the novel use of the device. However, two aspects of this report merit careful attention.

The first point is the terminology used to describe air leaks, ie, the differentiation between alveolar-pleural fistula (APF) and bronchopleural fistula (BPF). An APF is a communication between the pulmonary parenchyma distal to a segmental bronchus and the pleural space, while a BPF is a communication between a main stem, lobar, or segmental bronchus and the pleural space.3 This distinction is not merely an academic one but is therapeutically important because the treatment for the two types of fistula is drastically different. BPFs have significant morbidity and almost always require reoperation or some type of surgical intervention. By contrast, an APF rarely, if ever, require reoperation. Most air leaks, even after elective pulmonary resection, are APFs and not BPFs, while air leaks resulting from parenchymal necrosis are invariably APFs.3 Hence, it would have been more appropriate to use the term APF while describing the persistent air leak in this patient.

Secondly, the authors have not graded the air leak. Until very recently, there was no classification system. Presently, the air leaks are classified into four types.4 The largest and most uncommon is a continuous air leak, which is present throughout the respiratory cycle. This is seen in the patients who are receiving mechanical ventilation or have bronchopleural fistula. The second largest type is an inspiratory air leak seen almost exclusively in the patient receiving mechanical ventilation or with a sizable APF or a small BPF. The third largest leak is an expiratory air leak, which is present only during expiration. This type of leak is commonly seen after pulmonary surgery and is usually due to APF. Finally, if a leak is present only with coughing, it is referred to as forced expiratory leak. More than 98% of air leaks after elective pulmonary surgery in patients not using ventilators are expiratory or forced expiratory leaks.2–4 The other feature of air leaks is the size of the air leak determined with the help of a commercially available air leak meter in which the leak is measured on a scale from 1 to 7. This system not only allows proper distinction of air leaks but also has therapeutic implications. Studies5,6 have shown that water seal is superior to suction in small air leaks, but large leaks (greater than E4) require suction.

I thank Drs. Singh and Agarwal for their insightful comments regarding our report of placing a removable endobronchial valve to facilitate closure of a bronchopleural fistula (BPF).1 We are in full agreement that precise terminology should be used when describing the underlying pathophysiology of persistent air leaks. Unfortunately, the accompanying video was not originally published as an on-line supplement as intended. I urge Drs. Singh and Agarwal to view the video (now available on-line), as it will be clear that our case was in fact due to a BPF and not an alveolopleural fistula. It shows the a flexible bronchoscope being passed via a rigid bronchoscope to the posterior basal segment of the left lower lobe with visualization of a second bronchoscope that was passed through the Eloesser flap into the pleural space. This is clearly at the bronchial level and not the parenchymal level, and hence qualifies as a true BPF. Our patient had a continuous leak through her Eloesser flap despite surgical closure, application of fibrin glue, and use of a latissimus dorsi muscle flap to cover the stump. In patients with complex BPFs, the use of removable endobronchial valves truly represents a novel approach to treatment. Their use may also be beneficial for persistent air leaks secondary to alveolopleural fistula refractory to other therapy.

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REFERENCES


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The authors have no conflicts of interest to disclose.

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Bilevel Pressure vs Volume Ventilators for Amyotrophic Lateral Sclerosis Patients

To the Editor:

Limiting amyotrophic lateral sclerosis patients to using low-span bilevel positive airway pressure to treat “sleep-disordered breathing” invariably results in respiratory failure and death or tracheotomy.1 On the other hand, portable volume ventilators can initially rest inspiratory muscles and eventually be used for continuous ventilatory support via 15-mm mouthpieces and nasal or oral interfaces (NIV).2 The advantages of using volume modes rather than pressure modes is that they permit independent “air stacking” to mobilize lung and chest wall tissues to maintain lung compliance and facilitate coughing.3 They can also eliminate any need for tracheostomy, provided that bulbar-innervated muscle dysfunction does not result in aspiration that causes continuous oxyhemoglobin desaturation < 95%.4 The key is in the objective assessment of bulbar-innervated muscle function, something with which Ahuja et al5 are apparently unfamiliar.6 We have decannulated amyotrophic lateral sclerosis patients with no autonomous ability to breathe but with some bulbar-innervated muscle function for up to 10 years before loss of the latter necessitated tracheotomy.4 The recommendation made by Ahuja et al5 for resorting to tracheotomy when the need for NIV exceeds 20 h a day is debatable and certainly not desired by patients.5 “Failure of clinicians to use assist/control modes with adequate delivered volumes to continuously maintain normal lung ventilation and use mechanically assisted coughing to clear the airways”4 is most often a confusion leading to failure of clinicians to use assist/control modes with adequate delivered volumes to continuously maintain normal lung ventilation and use mechanically assisted coughing to clear the airways.4 Beginning low-span bilevel positive airway pressure, when it would only need to be changed to NIV to prevent ventilatory failure, confuses patients and insurance companies and should be discouraged.

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To the Editor:

We acknowledge the comments by Dr. Bach regarding our recent article in CHEST (June 2006). Although respiratory problems are the main cause of death in patients with amyotrophic lateral sclerosis (ALS), many patients do not receive appropriate and timely management of their respiratory problems.2 The purpose of discussing our case was to highlight sleep-disordered breathing as an important presentation in patients with the bulbar form of ALS.

In patients with ALS, pressure-limited ventilation may be better tolerated than volume-limited ventilation.3 Bach4 has preferred the use of volume-limited ventilation because the air stacking necessary for using some of the expiratory aids cannot be accomplished with pressure-limited devices. Bulbar symptoms are usually associated with intolerance of noninvasive positive-pressure ventilation (NIPPV). However, as in our case, approximately 30% of patients with bulbar symptoms are able to tolerate NIPPV; tolerance of the device in this group of patients confers a survival advantage.5 In a recent study, Lechtzin et al6 suggested that patients with ALS have diaphragmatic weakness and reduced lung compliance, and that some of the beneficial effects of NIPPV therapy may be the result of its effects on lung compliance and the work of breathing.

Management decisions regarding the treatment of ALS patients are often made by emergency/critical care department doctors, and sometimes the patient’s opinion is ignored.2 The statement that “Beginning low span bi-level PAP [positive airway pressure], when it would only need to be changed to NIV [noninvasive ventilation] to prevent ventilatory failure confuses patients and insurance companies,” implies that NIV is volume-limited ventilation and that treatment decisions in progressive neuromuscular disease are straightforward. However, NIV can be delivered by a volume ventilator or a bilevel pressure ventilator,6 and in recent years medical decision making has become more complex with conflicts arising frequently between the health-care expenditures system and the patient’s autonomy.7

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