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eComment. Post-pneumonectomy bronchopleural fistula: covered metallic stent or Amplatzer occluder?

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Andreetti and colleagues reported their experience with the use of a conical fully covered self-expandable stent for the treatment of post-pneumonectomy bronchopleural fistula [1]. A bronchopleural fistula (BPF) is an alarming complication of pneumonectomy, which leads to significant morbidity and mortality. The incidence of BPF ranges from 4.5% to 20% and such wide variability is correlated to the patient's condition, the pathology, the resection technique, and the experience of the surgeon.

The standard approach includes an open wound thoracostomy, skin flap, and antiseptic packing for several months. This procedure is complicated by persistent or recurrent BPF and a long hospital stay. A most recent surgical technique consists of the debridement of the pleural space followed by the suture of the bronchial stump buttressed with omentum or a muscular flap [2].

Innovative minimally invasive techniques have been proposed for the patients who are unable to tolerate major surgical procedures. Various endoscopic approaches (fibrin glue, surgical sponges, ethanol injection, etc.) seem to be effective for small BPFs with the highest success rate for fistulas of 1 mm in diameter. The use of airway stents in the management of large post-pneumonectomy BPF has been reported; silicone was initially the preferred material [3], but the use of covered self-expandable metallic stents has been reported since 2005.

Recently, Dutau and colleagues reported their experience with a custom-made self expandable covered metallic stent in 7 patients with large post-pneumonectomy BPF (>6 mm); the air leak was stopped in all the patients after stent placement, but the mortality was still high (57%), mainly due to sepsis [4]. Although Dutau and colleagues noted two stent migrations, the technique can be positively regarded, especially for the immediate stop of the air leak. The Andreetti's report is similar to the Dutau paper in terms of technique and number of patients but some differences must be underlined.

All patients had early BPFs (within 7 days from pneumonectomy) and pleural spaces were still spared from infection. The use of a standard-sized instead of a custom-made stent allowed its prompt positioning, which was probably the key point for Andreetti's good results. In addition, the use of titanium helical tacks was a smart idea that prevented any stent migration.

A new technique has been proposed for treatment of post-pneumonectomy BPF. Fruchter and colleagues recently published their experience with the positioning of the Amplatzer atrial septal occluder in 10 patients (8 post-pneumonectomy BPF, 2 post-lobectomy BPF) [5].

The Amplatzer occluder was inserted directly into the fistula. The presence of two disks, one on each side of the defect, ensured good occlusion without impairing airway patency. The device induced local granulation that resulted in the total encapsulation of the occluder. Fruchter, who included a literature review in his paper, reported that the procedure had been well tolerated without side effects or complications [5].

The Amplatzer occluder seems more attractive than the covered metallic stent: the occluder is easily-positioned with a flexible bronchoscope under direct vision. The occluder leaves the airway free from foreign material. The problem of the sputum retention within the covered metallic stent is avoided and the occluder does not need to be removed with a second procedure as is required by a metallic stent. All these theoretical advantages have led us to use the Amplatzer occluder in a BPF after a superior right sleeve lobectomy. The procedure was simple and uneventful, the rate of flow of the air leak was dramatically reduced, the clinical condition improved and the patient was discharged within few days. Unfortunately, 31 days after the procedure a suddenly lethal hemoptysis occurred. Such previously unreported complications should be considered when a surgeon needs to choose a device for BPF treatment.

In conclusion, the covered metallic stent and the Amplatzer occluder are promising devices for minimally invasive BPF treatment. Considering the low prevalence of the post-pneumonectomy BPF, a multi-institutional randomized trial is advisable to guide surgeons toward the safer procedure for the treatment of a difficult and challenging disease such as BPF.

Conflict of Interest: None declared

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eComment. Post-pneumonectomy bronchopleural fistula

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