

Letter to the Editor

A new method for diagnosis of tracheoesophageal fistula

Dear Editor,

The most common cause of acquired tracheoesophageal fistula (TEF) is prolonged intubation for ventilatory support¹. The most important reason of acquired TEF is that the higher and longer pressure of endotracheal tube (ETT) cuff result in deeper and broader ulcers, total disruption of mucosal ischemia and necrosis in trachea and esophagus. Furthermore, repeated ETT intubations or excessive movement of the patient's head may produce shearing forces that result in the injury, which led to mucosal ischemia, necrosis, and ultimately erosion into the trachea and esophagus. These factors all together may contribute to the TEF².

The clinical features of TEF in patients with ventilatory support include the following:

- a) leaking air from the spirit way, even if the air sac is full, there will still be air leakage and no relief;
- b) the gas entering the esophagus upward will overflow through the mouth, and the patient's mouth will have abnormal sounding, and even some saliva bubbles will overflow;
- c) the gas entering the esophagus downward will get into the gastrointestinal tract and cause obvious flatulence;
- d) exclusion of ETT shifting and falling off.

The development of TEF may lead to the occurrence of aspiration, and even endangering the lives of patients. Therefore, it is important to diagnose TEF at an early time.

Fiberoptic bronchoscope (FB) is often used to observe the formation of TEF through the ETT in ICU. However, due to the obstruction of the ETT wall and air sac, the TEF could not be observed by the FB. Of course, we can also use a gastroscope to confirm whether there is a TEF. Gastroscope can easily find the TEF that the white air sac breaks through the front wall of the esophagus. But there are many risks in transporting these critically ill patients to the endoscopy room.

We know that there is a difference between FB and gastroscopy. It is necessary to inflate air into the esophagus and stomach to open up the esophagus and stomach so as to form a clear view during gastroscopy. Nonetheless, when the FB enters the esophagus, the esophageal wall is close to the FB because the esophagus has no cartilage support to keep opening. The field of vision is too small to see clearly, so it is difficult to find the fistula (Figure 1). So, when FB is instead of a gastroscope, we must also inflate air into it. How can we do it? The FB has a negative pressure suction joint, we can connect it to the oxygen line. When the FB enters the esophagus, as long as you press the suction button of the FB, a positive pressure of oxygen will enter the esophagus through the negative pressure suction channel, thus opening the esophagus (Figure 2). Moreover, the pressure can be regulated by adjusting the oxygen flow, which is convenient for FB to observe whether the esophageal wall is complete.

There is no clinical report on the application of this method in the diagnosis of TEF from now on. We need prospective trials to demonstrate it could be a new method for diagnosis of TEF in ICU.

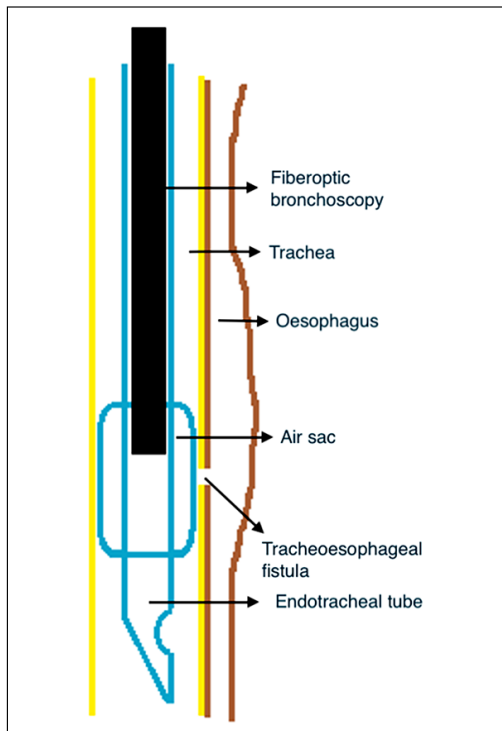


Figure 1. The illustration of FB enters the esophagus without positive pressure. The field of vision is too small to see clearly because of the esophageal wall is close to the FB.

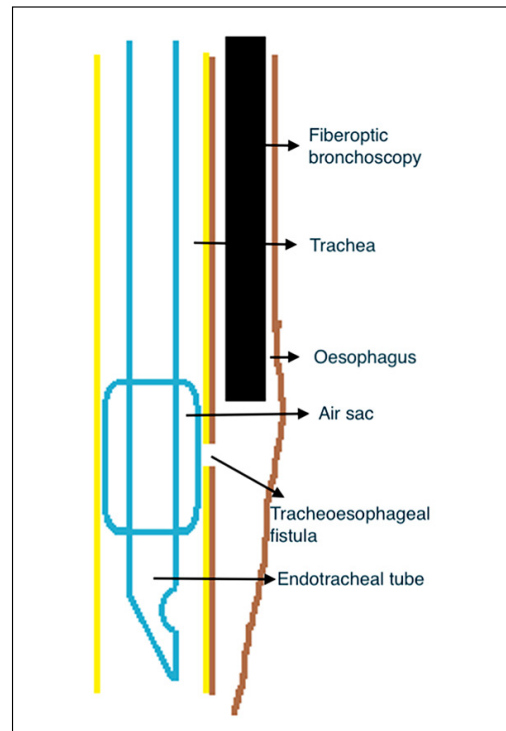


Figure 2. The illustration of FB enters the esophagus with positive pressure. A positive pressure of oxygen will enter the esophagus through the negative pressure suction channel, thus opening the esophagus. The field of vision is clear.

Conflict of Interest

The Authors declare that they have no conflict of interests.

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Ethics Approval and Consent to Participate

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Consent for Publication

All authors agree to publish this letter in this journal.

Authors' Contributions

Chen Weiting and Lin Aini conceived and designed the study and interpreted the data. Lin Xiaoyan made the picture and revised the article. All of the authors read and approved the final manuscript.

References

- 1) Marzelle J, Darteville P, Khalife J, Rojas-Miranda A, Chapelier A, Levasseur P. Surgical management of acquired post-intubation tracheo-oesophageal fistulas: 27 patients. *Eur J Cardiothorac Surg* 1989; 3: 499-502.
- 2) Merino PL. *The ICU Book*. 2nd ed. Media, PA: Williams and Wilkins; 1997; pp. 455-457.

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