

## Suprasternal notch needle decompression to treat severe pneumomediastinum

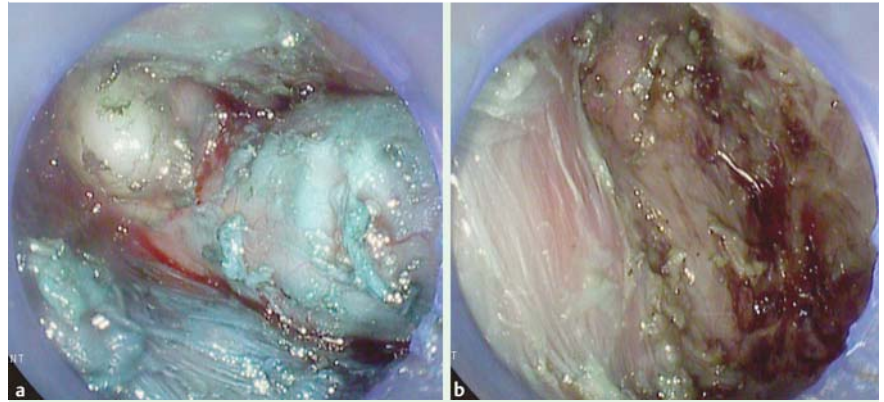
A 56-year-old man underwent endoscopic submucosal tunnel dissection (ESTD) for an esophageal submucosal tumor. Because the patient had the co-morbidity of moderate chronic obstructive pulmonary disease (COPD), room-air insufflation instead of carbon dioxide insufflation was used during the operation. We began the procedure by making a longitudinal incision 4cm above the targeted tumor; a submucosal tunnel was then created downward to the distal end of the tumor. The tumor was dissected en bloc from the surrounding submucosal tissues and smooth muscle fibers (► **Fig. 1 a**), and retrieved orally. The initial mucosal incision was closed by clips.

During tumor dissection, there was iatrogenic injury to the muscularis propria (► **Fig. 1 b**) and mediastinal emphysema occurred immediately as the esophagus has no serosa. Severe subcutaneous emphysema of eyelid, face, neck, and submandibular region was observed; palpation of the chest and neck was characteristic and gave the impression of palpating “snow.” The patient’s heart rate soared to 130 beats/min while his blood pressure dropped to 80/60 mmHg and oxygen saturation down to 80%.

We attempted needle decompression before the patient would have been transferred to surgery. After topical disinfection, the needle of a 22-gauge syringe that was preloaded with 2 ml of normal saline was inserted into the skin over the superior border of the sternal bone (the jugular notch). The needle was advanced until air could be aspirated into the syringe (bubbles in the normal saline). The loading device was then removed and air continued to be expelled from the chest (► **Fig. 2**, ► **Video 1**). Meanwhile, the subcutaneous emphysema was significantly relieved. The needle was removed when there was no further escape of air. Antibiotics were given for 2 days postoperatively, and the patient was discharged uneventfully after 5 days.

### Video 1

Needle decompression at the suprasternal notch for treatment of severe pneumomediastinum.



**Fig. 1** a The esophageal submucosal tumor seen in the submucosal tunnel during endoscopic submucosal tumor dissection (ESTD). b The iatrogenic injury to the muscularis propria layer after tumor resection.



**Fig. 2** Needle decompression at the suprasternal notch to treat severe pneumomediastinum. Air escaped from the mediastinal cavity into the syringe.

The emergence of the endoscopic resection of esophageal lesions has occasioned a new iatrogenic cause of mediastinal emphysema. In severe cases complicated by respiratory and circulatory failure, needle/tube aspiration at the intercostal space is less effective and surgical intervention may be required. In this case, we found the “Achilles heel” of severe med-

iastinal emphysema – the suprasternal notch – and released the trapped air quickly and effectively.

Endoscopy\_UCTN\_Code\_CPL\_1AH\_2AH

**Competing interests:** None

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#### **Bibliography**

**DOI** <http://dx.doi.org/10.1055/s-0034-1377441>  
Endoscopy 2014; 46: E343–E344  
© Georg Thieme Verlag KG  
Stuttgart · New York  
ISSN 0013-726X

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