

A Case Report of a Soldier with Combined Injuries to the Trachea and Esophagus After Blunt Neck Trauma Successfully Treated Through an Emergency Operation

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Case Report

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Abstract

Background: Survival following blunt neck trauma that results in a combination of tracheal plus esophageal injury is unusual. Here we describe a case of young soldier who suffered combined injuries to the trachea and esophagus after a secondary injury involving a metal bar.

Case Presentation: A 21 years old soldier who suffered from a daily training injury complained of neck ecchymosis with subcutaneous emphysema. The chest CT revealed that paratracheal adipose tissue had moved into the trachea and with massive pneumomediastinum and subcutaneous emphysema. We made a suspected diagnosis of tracheal injury because of the pneumomediastinum. Subsequently, the tracheoscopy revealed a 2-3 cm linear tear of the proximal trachea, with adipose tissue extending into the trachea. Twelve hours after the accident, an emergency surgery was performed. Combined injuries of the trachea plus esophagus were found by accident during the operation. The trachea as well as esophagus was repaired with simple interrupted silk sutures. The patient showed good postoperative recovery and was discharged with no complications.

Conclusion: Combined blunt traumatic injuries to the laryngotrachea as well as esophagus are rare. Although uncommon and a diagnostic and management challenge, the illustrated case resulted in excellent outcome.

Introduction

A combination of blunt traumatic injuries of the laryngotrachea plus esophagus is rare and maximum numbers of patients probably die on the way to the hospital [1]. They are generally restricted to the cervical trachea, developing due to direct blunt injury to the anterior neck. The few survivors who arrive at the emergency department create a challenge to the doctors with regards to acute management of the respiratory tract as well as diagnosis of occult injuries. These patients might experience poor prognosis or long-term complications if they are not diagnosed in a timely manner. Here we describe a case of acute traumatic combined injuries of the trachea and esophagus diagnosed in time and successfully treated.

Case Presentation

The patient was a 21-year-old male Fire Fighter, who suffered a head-on collision with a bar during training. He was presented to the casualty department 2 hours later. His main injuries on presentation were cervical bruises and widespread subcutaneous emphysema. No significant cartilage fracture or chest trauma was found. He was steady from a respiratory as well as hemodynamic standpoint following the accident and was capable to ambulate as well as talk at an external facility. A computed tomogram showed a tracheal rupture and emphysema alongside the trachea (Fig. 1). We made a suspected diagnosis of tracheal injury because of the pneumomediastinum and subcutaneous emphysema. No other significant thoracic injury, such as rib fracture, was detected based on the CT scan. The bronchoscopy showed a 2–3 cm linear tear in the posterior tracheal wall, with contents of adipose tissue

extending into the trachea (Figs. 2 and 3). It is regrettable that it was not possible to perform Upper Gastrointestinal Contrast at night. Despite the patient remaining hemodynamically stable, cervical subcutaneous emphysema slowly worsened. This sign indicated that the tracheal injury could not be treated conservatively. Twelve hours after the accident, an emergency surgery was performed. The operation was performed through a collar incision to immediately recognize a 3 cm longitudinal injury in the posterior membranous wall of the trachea. In addition, an esophageal injury was found by accident during the operation (Fig. 4). The trachea and esophagus were repaired using simple interrupted silk suture (Fig. 5). Unfortunately, we could not make the flap mobilized from the strap muscles to ensure a well-vascularized barrier between the repaired esophagus and trachea. A cervical drain was positioned next to the location of anastomosis. The patient was then moved to the intensive care unit. He was maintained on enteral nutrition for 7 days administered through a nasogastric tube, at which time an Upper Gastrointestinal Contrast, which was performed, did not show any evidence of an anastomotic leak. He was then given liquids, followed by gradual advancement to solid foods. He was discharged and remained asymptomatic for more than 2 years after the operation. No perioperative complications and dysfunction of dysphagia and dysphonia were identified.

Discussion

Blunt neck trauma can be a life threatening injury due to the presence of many vital organs in the neck. Most patients may die on the scene due to respiratory tract obstruction. Blunt tracheal injury along with esophageal injury is rare. Adequate reports are not available to estimate the frequency of this type of cases using the literature [2]. This mechanism of laryngotracheal injury is secondary to that caused by a rope/wire (33% of cases) and that caused by a metal bar (4% of cases) [3]. Quick deceleration produces a trimming power that disrupts the trachea. Most medical centers will have limited experience of combined blunt tracheoesophageal injury. The finding of tracheal injury secondary to nonpenetrating trauma is frequently challenging to make, since maximum number of patients presents with broad-spectrum indications. Timely presentation at a hospital and high levels of multi-disciplinary cooperation is beneficial for accurate clinical diagnosis and therapy. Furthermore, it is equally important to prevent serious complications, such as shock, sepsis and laryngeal stenosis.

Clinical examination plays a decisive role in trauma patients, although radiological imaging is routinely used. Numerous indications related to tracheal injury comprise aphonia, hoarseness, hemoptysis as well as subcutaneous emphysema. However, medical indications are broad-spectrum, while the diagnosis of laryngeal injury is assumed based on the existence of subcutaneous emphysema and voice changes. In the case described, the main injuries on presentation of this patient were only neck ecchymosis and widespread subcutaneous emphysema. Esophageal injuries, especially cervical esophagus, present obscure symptoms, and are easily misdiagnosed. In this case there was a posterior tracheal tear, as well as an esophageal injury, at the time of initial neck trauma. However, the main injuries on presentation of this patient did not produce descriptive symptoms. Esophageal injury was found by accident during the operation. If cervical esophageal injury is not diagnosed, it may lead to morbidities, such as mediastinitis, esophageal stenosis as well as tracheoesophageal fistula.

Except for clinical signs, the CT scan indicated the presence of subcutaneous emphysema and pneumomediastinum, which should raise suspicion of injury to the cervical trachea. Bronchoscopy examination can verify the depth and length of injury. Esophageal injuries might need both endoscopy as well as upper gastrointestinal contrast to identify any perforation. Although flexible endoscopy can directly visualize esophageal mucosa perforation, the examination needs to be conducted in a manner that avoids exacerbation of the injury. In this case, flexible fiber-optic bronchoscopy revealed a 2–3 cm longitudinal tear in the posterior tracheal wall, with the contents of adipose tissue extending into the trachea. Furthermore, there was slow deterioration of subcutaneous emphysema indicating an on-going air leakage. These findings mandated an emergency operation rather than conservative treatment.

The repair of cervical tracheoesophageal injuries is challenging for the surgeon because these damages are rare. A multidisciplinary preoperative assessment was encouraged. Prompt surgical reparation is the favored method of treatment for most patients with a trachea transmural tear, exceeding a length of 2 cm [4]. [4]Conservative treatment may be appropriate for patients with short lacerations in the upper third of the trachea, particularly if it does not include the complete thickness of the tracheal wall. Esophageal injuries might be managed conservatively with or without drainage techniques or through initial reparation depending upon the degree of the laceration as well as the location of esophageal injury [5]. In this case, there was slow deterioration of neck subcutaneous emphysema and this indicates tracheal injury that cannot be treated conservatively. The 1-stage reconstruction method is advisable due to immediate diagnosis and the nonappearance of substantial contamination. Early oral feeding should be avoided, and nutrition support should be given either through simple enteral nutrition or parenterally via the central venous system.

Conclusions

The combination of posterior tracheal wall laceration plus esophageal injury, with secondary blunt cervical trauma, poses numerous challenges for management. Understanding the mechanisms of injury can help the doctors make a prompt suspected diagnosis. Endoscopic as well as radiographic examinations are utilized to confirm the exact location of the lesions, while they are treated as appropriate via conservative management or aggressive surgery. Although uncommon and a diagnostic and management challenge, the illustrated case resulted in excellent outcome.

Abbreviations

CT, computerized tomography

Declarations

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

CONSENT FOR PUBLICATION

The Author agrees to publication in the Journal indicated below and also to publication of the article. The patient has already given written consent for his personal and clinical details along with any identifying images to be published in this study.

If anyone requires this information, I can upload or provide a text.

AVAILABILITY OF DATA AND MATERIAL

Not applicable

COMPETING INTERESTS

The authors certify that there is no conflict of interest with any individual/organization for the present work.

FUNDING

Not applicable

AUTHORS' CONTRIBUTIONS

Dr. Zheng, Dr. Zhenliang and Dr. Zhang participated in the operation. Dr. Zheng drafted the work. Dr. Xu made minor changes and then substantively revised it.

ACKNOWLEDGEMENTS

Not applicable

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Figures



Figure 1

Subcutaneous emphysema is noted, as well as posterior tracheal rupture.



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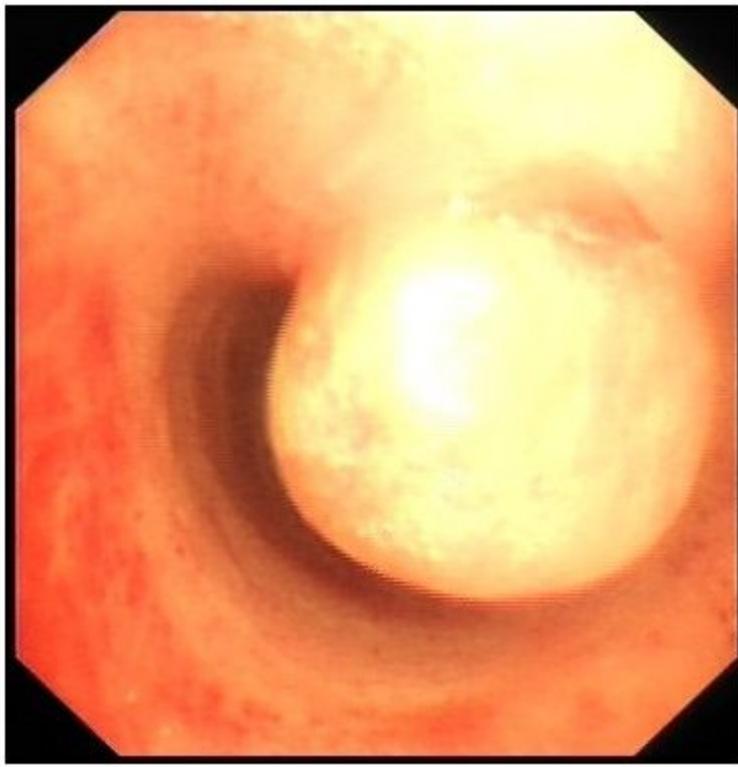


Figure 2

Bronchoscopy showed adipose tissue extend into the trachea.

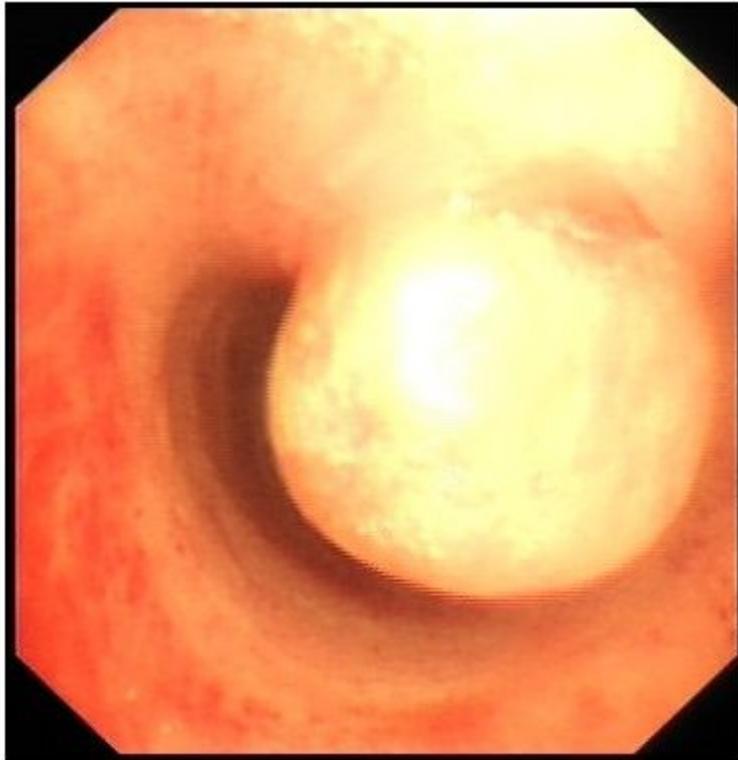


Figure 2

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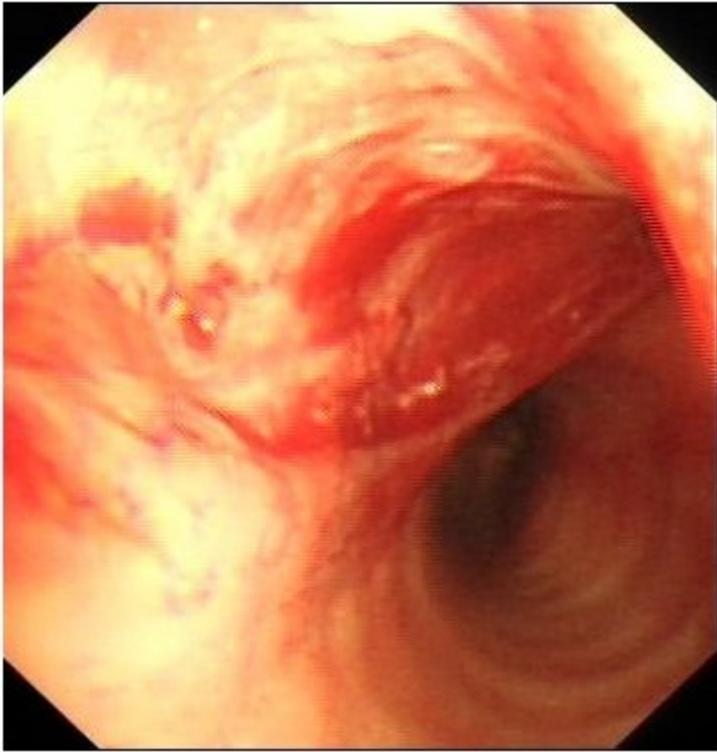


Figure 3

Flexible fiber-optic bronchoscopy revealed an extensive longitudinal tear in the posterior tracheal wall.

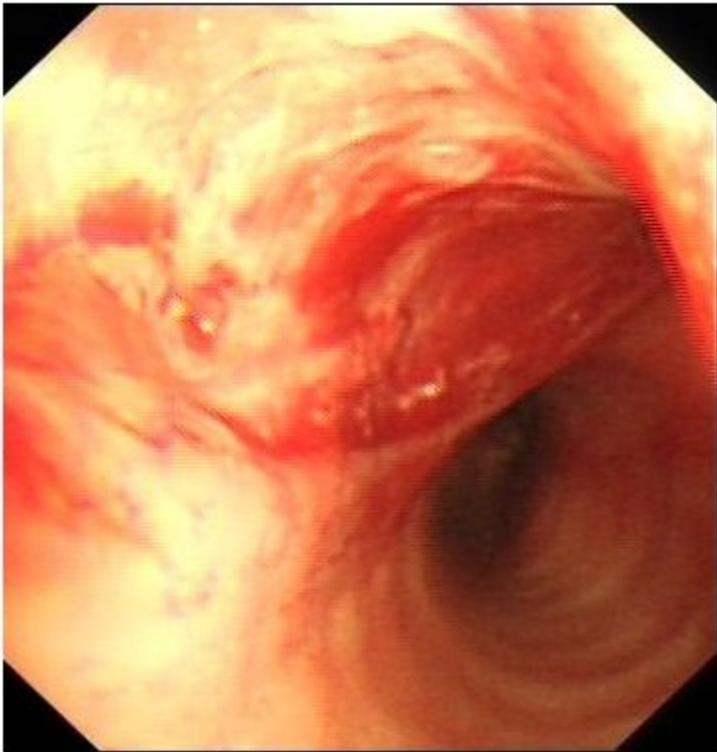


Figure 3

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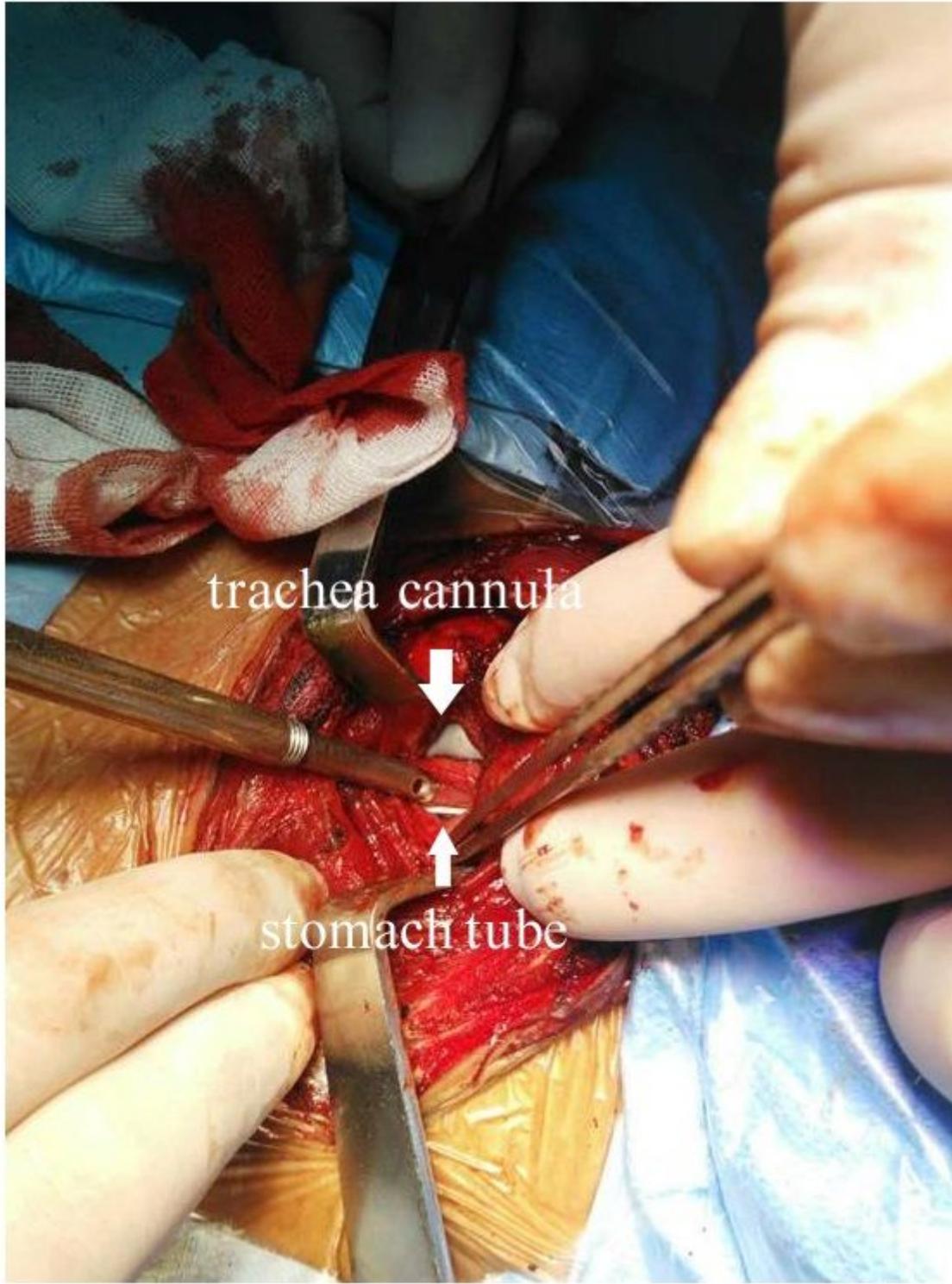


Figure 4

Clinical photograph of the surgical field during neck exploration: the tracheal intubation and stomach tube were visible.

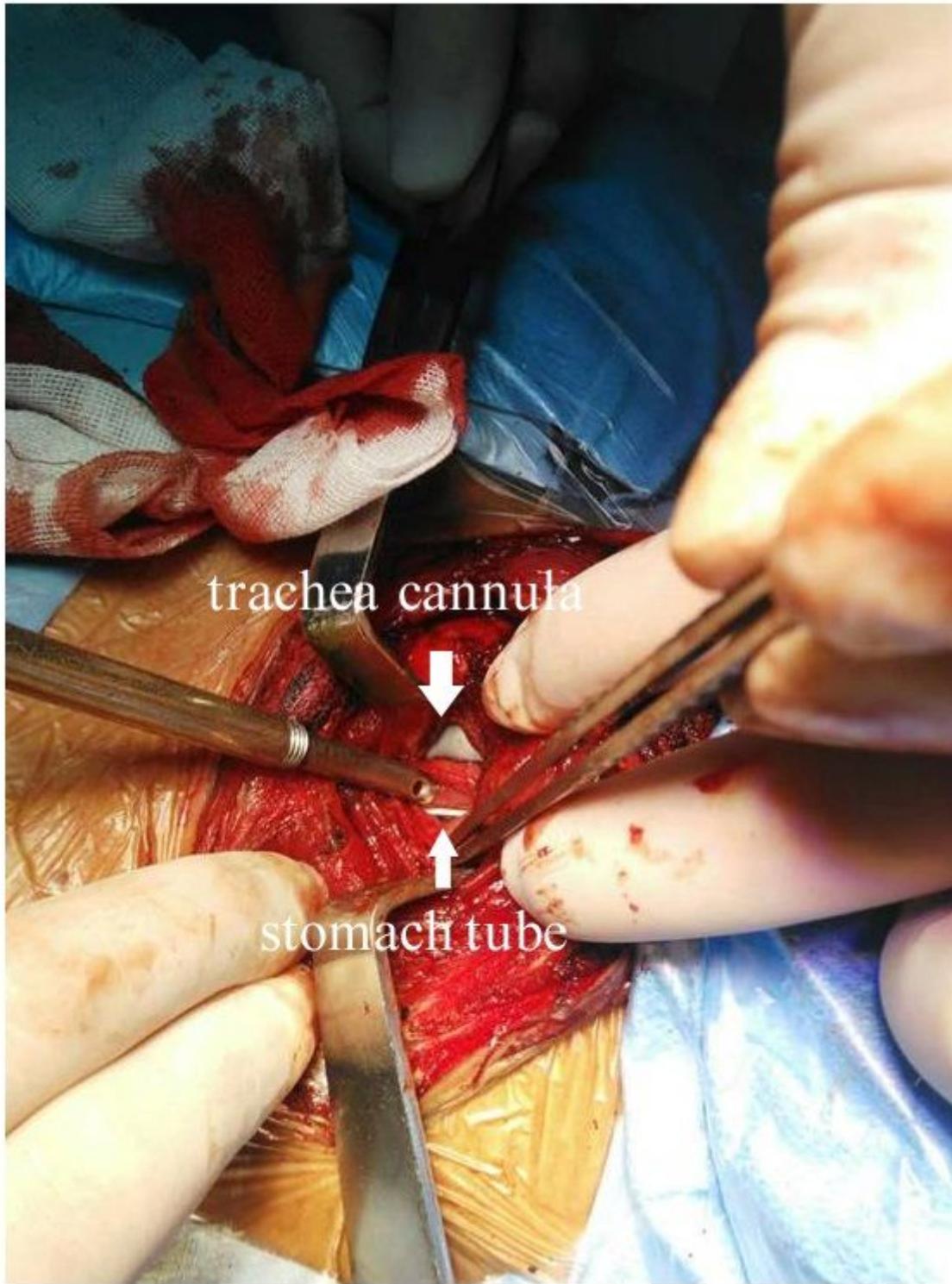


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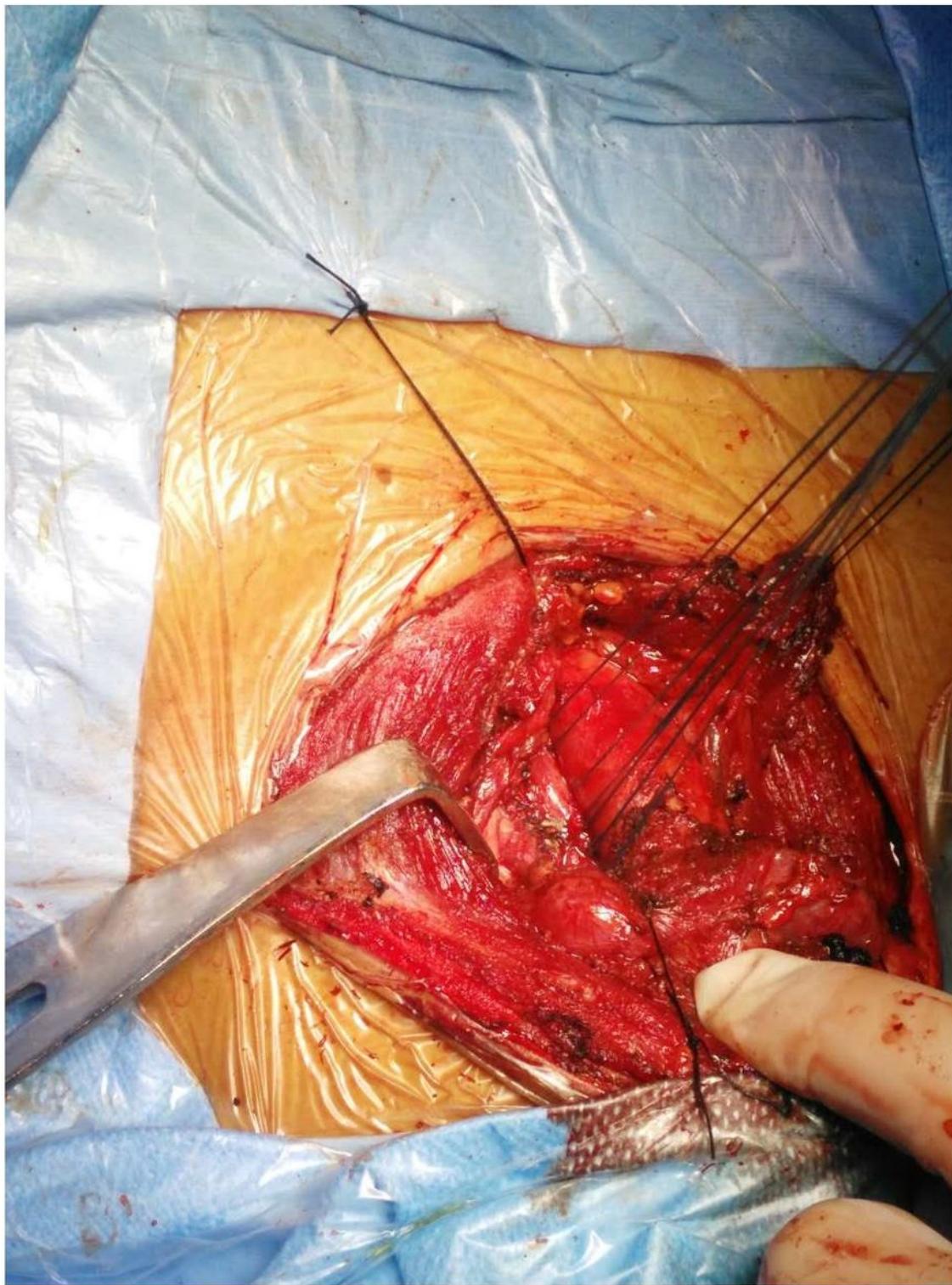


Figure 5

The trachea and esophagus was repaired with simple interrupted silk suture.

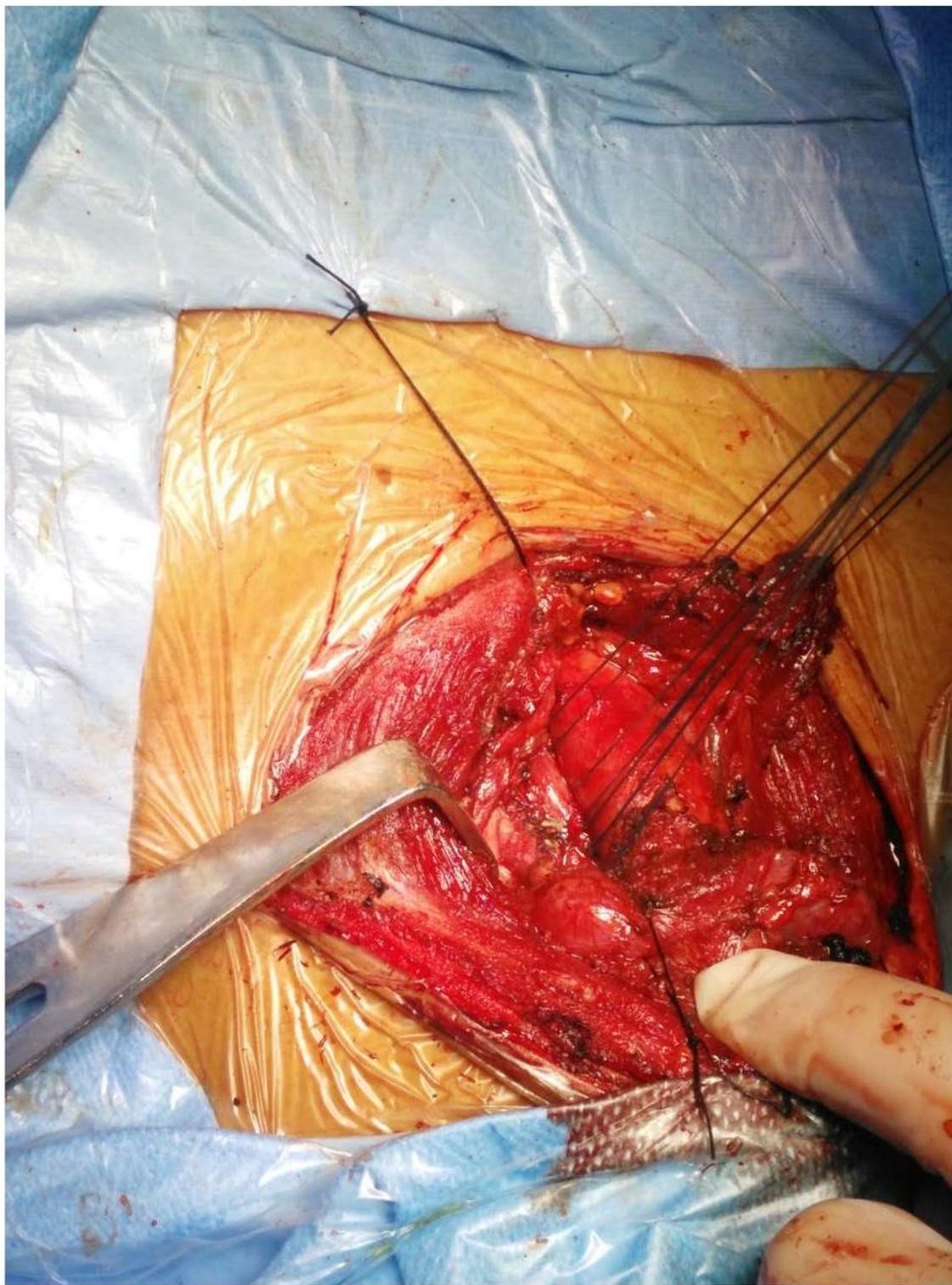


Figure 5

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