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Case Report

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Esophageal perforation with double lumen tracheal cannula

Abstract

We present a case with an unusual complication due to difficult tracheal intubation. A cervical esophageal perforation by a carinal hook in a double lumen cannula after one attempt. Besides the use of antibiotics, his therapeutic option was an endoscopic positioning for seven haemoclips with favorable evolution.

Keywords: Difficult Intubation, Complication, esophageal Perforation

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Introduction

The use of double lumen tracheal cannulae (DLC) is common in anesthesia for intrathoracic surgery requiring one-lung ventilation for pulmonary or, oesophageal procedures and thoracic aorta as well. Infections restricted to one lung, such as unilateral lung abscess, is a high-priority indication of the use of DLC to avoid contamination of the contralateral lung. However, intubation with DLC is more difficult than the conventional cannula, because it is more caliber and especially when the double lumen cannula has a carinal hook that helps to fix the stem in the primary carina and reduce its displacement. Complications during the use of DLC include trauma to the laryngeal cartilages, trachea, and pneumomediastinum.[1] Esophageal injuries associated with difficulties in tracheal intubation are events with unfavorable outcomes and high mortality.[2,3] We present the case of a patient with esophageal perforation after attempted tracheal intubation and treatment with endoscopic staple placement.

Case summary

A 54-year-old male patient, ASA 3 due to systemic arterial hypertension and decompensated type 2 diabetes secondary to bacterial pneumonia and lung abscess. He was febrile (38.5°C), tachypneic, and had a peripheral oxygen saturation (SpO_2) of 95%, supplemental oxygen was given by a nasal catheter at 3L/min. Complementary tests, leukocytosis (18,300 leukocytes with rods and segmented), hematocrit of 36%, and blood glucose of 185mg/dL. Treatment with clindamycin and ceftriaxone was started without improvement, and thoracoscopy was indicated for drainage of the lung abscess.

Upon physical examination, the patient had a height of 1.70 m, the weight of 80 kg, Mallampati 2, mouth opening greater than 3 cm, good cervical mobility, and teeth in good condition. Monitored with electrocardiography, non-invasive blood pressure, pulse oximetry, and peripheral neurostimulator. After pre-oxygenation, anesthesia was started with lidocaine 80mg, fentanyl, 250micrograms, propofol 100mg, and rocuronium 40mg. Laryngoscopy with McIntosh laryngoscope showed partial visualization of the larynx classified as Comarck grade III. Tracheal intubation was attempted with a 39fr double lumen cannula with a carinal hook and it was immediately noted that it presented resistance to the passage of the carinal hook and subsequently migrated to the esophageal introitus. A new attempt with the Mc Grath video laryngoscope (Aircraft Medical Ltd, Edinburgh, UK) presented a total visualization of the larynx without identifying lesions or bleeding. Intubation was performed with the same caliber new cannula. The surgery took 75 minutes, with 40 minutes of one-lung ventilation. The patient remained hemodynamically stable and did not have episodes of decreased peripheral oxygen saturation. He was extubated without complications and transferred to the recovery room with oxygen supplementation using a Hudson mask.

After 45 minutes, he complained of pain in swallowing, which was relieved with a bolus of 5mg morphine and scopolamine. After 110 minutes, he was discharged to the ward with a nasal catheter of O_2 at 3L/minute, maintaining an SPO_2 of 96%. Eight hours after the operation, he again pain when swallowing liquids and started cervical subcutaneous emphysema during respiratory physiotherapy. A chest X-ray was performed showing pneumomediastinum, confirmed by tomography. Bronchoscopy showed no changes and a digestive endoscopy noted an esophageal lesion with about 2cm to 20cm of the upper dental arch (Figure 1).

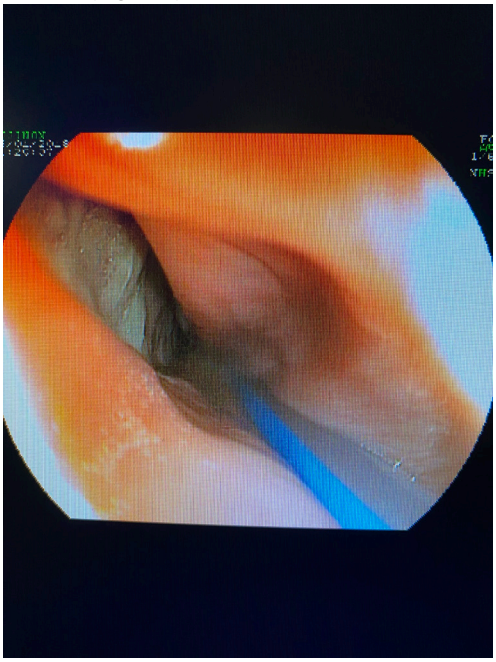

Figure 1

A cervicotomy was proposed for esophageal sutures, but the patient refused further surgery. The endoscopist proposed placing a prosthesis in the esophagus, an idea that was ruled out due to the proximity to the upper esophageal sphincter. The option was to place hemostatic titaniun clamps and make an endoscopic gastrostomy for nutrition, options that the patient agreed with (Figure 2). Under sedation with propofol and oxygen supplementation in spontaneous ventilation, seven hemostatic clamps were placed in the cervical esophagus (Figures 3 & 4). Gastrostomy was maintained for 6 weeks until complete recovery from swallowing solid foods.

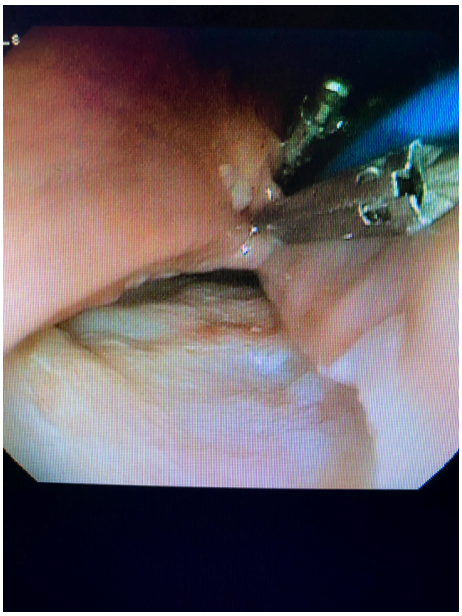

Figure 2

Figure 3

Discussion

The main causes of esophageal injury in anesthesia and intensive care are iatrogenic.[1-3] Passage of a gastric or enteral tube, the passage of an esophageal thermometer, probe for transesophageal echocardiography, and orotracheal intubation, either through the cannula or through guides inserted in them. Esophageal injuries during orotracheal intubation are associated with successive attempts[4], especially by physicians inexperienced in the management of airways. In the case presented, an anesthesiologist with 20 years of experience in anesthesia for thoracic surgery and familiar with the use of double-lumen cannulae encountered an unexpected difficulty in the first intubation attempt and chose to change the type of laryngoscope. The use of the McIntosh laryngoscope was the first choice because the patient did not present predictive signs of difficult laryngoscopy, yet it was tried once due to partial visibility (Comarck grade III), the carinal hook is a factor that makes difficult the passage and progression of the cannula through the larynx. The second attempt with video laryngoscopy did not show any injury or bleeding. During anesthetic recovery, the patient complained of pain when swallowing, a common fact associated with the use of double lumen cannulas, and he did not present other signs or symptoms that suggested something more serious. The patient maintained a high temperature and signs of infection, which was considered as expected for the evolution of the disease, only after the appearance of an early cervical and thoracic subcutaneous emphysema did we start the search for any lesion, we thought of pneumothorax despite chest drainage or tracheal perforation.

Figure 4

A bronchoscopy was normal and a CT scan of the neck and chest showed thoracocervical and pneumomediastinum emphysema, without mediastinal collection and with a resolution of the lung abscess. Esophagogastroduodenoscopy showed the cause of subcutaneous emphysema.

Esophageal perforations are potentially fatal complications due to contamination of the mediastinum and serious infections. The use of broad-spectrum antibiotics and not feeding by mouth are fundamental therapeutic measures. The use of a jejunostomy or gastrostomy helps to maintain the patient's nutrition, especially at a time of high catabolism. Early diagnosis of oesophageal perforation improves prognosis, but the low incidence of this anesthesia-associated complication leaves some doubts about more aggressive treatment. Cervicotomy with wound debridement and suture is the most common treatment, especially in lesions larger than 2 cm or with necrosis, other alternatives include placement of esophageal stents or use of staples.

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Surgeries to close esophageal fistulas can be by cervical or thoracic access and are associated with prolonged hospital stay and high mortality[1], A retrospective study showed good results with self-expandable metal stents in patients with esophageal fistulas, especially after bariatric surgery. However (,) when close to the esophageal sphincter, esophageal stents tend to migrate, in addition to dysphagia and the need for successive balloon dilatations.[6] For patients who refuses surgery or have no clinical condition for invasive procedures, the endoscopic treatment is an alternative.[7,8] Our patient refused to be operated on again but accepted the endoscopic treatment which could be the placement of a prosthesis, in this case, the endoscopist's option was the placement of titanium clips due to the proximity of the lesion to the upper esophageal sphincter. An endoscopic gastrostomy was also performed to maintain nutritional support. After 3 weeks the patient's diet was full of solid foods and after 12 days the gastrostomy was removed.

Conclusion

During tracheal intubation is unusual to cause esophageal damage with just one attempt. Thus there is a need for reinforced care in orotracheal intubation specialy with double lumen cannulas, even when performed by an experienced anesthetist. This case illustrates the possibility of non-surgical treatment of esophageal perforation an alternative to conventional surgery.

Acknowledgments

None.

Conflicts of interest

None.

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