



Tracheoesophageal Fistula: A Rare Complication of Tracheotomy

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ABSTRACT

Tracheoesophageal fistulas (TOF) are a rare but sometimes a severe complication of tracheotomy. Their clinical presentations, of varying severity, usually involve several symptoms. The diagnostic procedure always combines chest x-rays looking for a pneumothorax, a pneumomediastinum or an aerogastriy, and bronchial fibroscopy which determines the location, size and potential severity of the lesion. Therapeutic management is based on surgical repair. Prevention of TOF is important and must represent the real treatment.

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Introduction

TOFs are defined as a communication between the esophagus and the trachea, and are explained by the contiguity of these two organs [1].

Intubation or tracheotomy can each be the cause of a TOF, but it is mainly the intubation-tracheotomy sequence in the context of prolonged ventilatory assistance which is the main cause [2]. We report the case of a patient with a TOF secondary to surgical tracheotomy.

Observation

A 32-year-old patient with no significant pathological history was hospitalized in the intensive care unit for the management of a severe cranial trauma with an initial Glasgow Coma Scale score of 7 as a result of a road accident.

The patient was a pedestrian hit by a car. The cerebral CT revealed a 14 mm parieto-temporal extradural hematoma, haemorrhagic contusion foci and cerebral edema. No other lesions were detected.

The patient was intubated, ventilated, sedated and admitted to the operating room for the evacuation of his extradural hematoma. The evolution was marked by the occurrence of ventilator associated pneumonia, making ventilatory weaning difficult. The patient was tracheotomized at day 7 of his hospitalization.

The patient began to present repeated pneumonias with food debris in the tracheal aspirate. A thoracic computed tomography (CT) with contrast injection was performed and showed a 3 cm communication between the trachea's posterior wall and the oesophageal lumen.

There was no short-term surgical indication as the patient was in severe sepsis. Unfortunately, the patient died of multiple organ failure following a refractory septic shock of pulmonary origin.

Through these events, the diagnosis was a TOF due to a too inflated, poorly controlled tracheotomy balloon causing a lesion of the posterior wall of the trachea, leading to its perforation and fusion to the esophageal mucosa thus creating a fistula.

Discussion

TOF is a rare complication of prolonged tracheal intubation. Its incidence has been greatly reduced since the use of low pressure balloons; and approaches 0.5% of patients under long-term assisted ventilation [3].

"Ischemia of the tracheal mucosa" is recognized as the precursor element of the TOF physiopathology. Inflating a balloon up to a pressure of 20 to 30 mm Hg leads to a decrease in the perfusion pressure, mainly in the tracheal cartilages.

If the pressure in the balloon exceeds 60 mm Hg, all blood flow ceases. The use of a low-pressure, thin-walled balloon spreads the pressure over a larger area and allows a circulating flow to be maintained even for balloon pressures greater than 30mm Hg.

Other mechanisms have been reported :On one hand L. TOTY [4, 5, 6] describes the constitution of a hernia by the membranous part of the trachea forming a more or less diverticular sac and evolving thereafter towards an TOF. On the other, a tracheo-esophageal detachment with formation of an inter-tracheo-esophageal abscess has been evoked. It is from this abscess that the fistula develops[7,8].

The TOFs carry out an abnormal communication between the aerial tract and the digestive tract. They are then manifested by respiratory signs -which are due the passage of products of digestive origin towards the trachea leading to repeated pneumonias or even a massive bronchial inundation that produces a Mendelson's syndrome and rapidly causes death by asphyxia[9,10]-,and digestive signs such as abdominal bloating secondary to the passage of air coming from the digestive tract through the TOF [11].

The causes of this complication are: a peroperative lesion of the posterior wall of the trachea, a bad position of the cannula, especially its elbow, improper management of the balloon, especially pressure, a large or a too rigid gastric tube, esophagus fungal infection and malnutrition[12].

The use of radiological and endoscopic examinations remains the most appropriate means of asserting with

certainly the TOF and its topography. The chest x-ray profile incidence may show abnormal pneumatization of the esophagus and nonspecific signs of pneumonia. An air distension of the stomach and intestines may be present on the plane abdominal x-ray [13].

The therapeutic management of these patients will initially require stopping the inhalation of the gastric fluid through the fistula and resting the esophagus. The surgical treatment is indicated in a 2nd time. Recurrences are possible and mortality is not negligible [12].

Conclusion

TOF is a serious but rare complication during tracheotomy. Their incidence could increase if this gesture were to become commonplace. It should be borne in mind that tracheotomy is an invasive procedure with potential early and late complications can occur. Its impact could increase if tracheotomy were to become trivialised. Prevention of these fistulas requires the use of suitable equipment, monitoring the volume of air required to inflate the balloon and performing regular bronchial fibroscopies.

Conflicts of interest

The authors declare no conflict of interest.

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