Case Report
Olgu Sunumu

AN EMERGENT ENDOTRACHEAL INTUBATION COMPLICATED BY IATROGENIC TRACHEOESOPHAGEAL FISTULA

ACİL ENTÜBASYONA BAĞLI ORTAYA ÇIKAN İYATROJENİK TRAKEO-ÖZOFAGEAL FİSTÜL

Süreyya TALAY[1], Emre Can MERMİ[1], Levent ENVER[1]

0000-0002-4908-3850, 0000-0002-0020-3110, 0000-0002-5873-3704
[1] 29 Mayıs Devlet Hastanesi Kalp ve Damar Cerrahisi Kliniği, Ankara, Türkiye
Sorumlu Yazar/Corresponding Author: Süreyya TALAY E-mail:suereyyatalay@gmail.com
Geliş Tarihi/Received: 12.12.2019 Kabul Tarihi-Accepted: 25.12.2019 Available Online Date/Çevrimiçi Yayın Tarihi: 26.12.2019
Cite this article as: Talay S, Mermi EC, Enver L. An Emergent Endotracheal Intubation Complicated by Iatrogenic Tracheoesophageal Fistula. J Cukurova Anesth Surg. 2019:2(3),206-10. Doi:10.36516/jocass.2019.24

Öz

Bir hastada acil entübasyon sonrası ortaya çıkan semptomatik trakeo-özofageal fistül vakamızı sunuyoruz. 53 yaşındaki obez, kadın hasta yüksekten düşme öyküsü ve bilinç kaybı ile dış merkezde acil entübasyon sonrası acil servisimizde değerlendirildi. Acil serviste yapılan beyin bilgisayarlı tomografisinde derin intraparankimal hemoraji ve parankim ödemi gördük. Yoğun bakım tedavimizin altıncı gününde trakeal aspirasyonda yoğun sıvı geldiğini gördük. Aspirasyon mayisinde mide içeriği olduğunu tespit ettik. Bu nedenle, trakea endoskopik olarak değerlendirildi. Trakeo-özofageal fistül öntanısı ile yaptığımız bu değerlendirmede proksimal yerleşimli iki fistül olduğunu gördük. Bir aylık yoğun bakım tedavimizle hastamızın nörolojik ve klinik durumu tedricen düzeldi. Özellikle travma hastalarında, entübasyon güçlükleri ve çok sayıda entübasyon denemesi olması trakeo-özofageal fistül riskinin artırmaktadır. Klinik olarak fistül şüphesi bulunduğunda BT ve MRI görüntüleme tercih edilen diagnostik tetkiktir. Fistül varlığında erken düzeltici cerrahi yapılmalıdır. Bu hasta grubunda yoğun bakım tedavisinin göğüs cerrahi, radyoloji ve gastroenteroloji kliniklerinin iştiraki ile multidisipliner yapılmasında yarar vardır.

Anahtar kelimeler: İyatrojenik, Trakeo-özofageal fistül, Zor entübasyon

Abstact

We report a case of a rare complication, which is symptomatic tracheoesophageal fistula, of emergent entubation in a trauma patient. A 53 years old, obese, female patient with a history of accidental fail was evaluated at the emergency department. We observed an excessive amount of liquid drainage from tracheal aspiration at the sixth day of treatment. This liquid aspiration material also warned us for a suspicion of gastric juice/gastric feeding ingredients. Thus, we performed an endoscopic examination of trachea to clarify a possible fistula existence. This evaluation proved proximally located two different tracheoesophageal fistula (TEF) which we believed to form a passage from stomach to tracheal/pulmonary side. Neurological and clinical status of the patient improved gradually in the first month of treatment. We believe that, especially for trauma patients, intubation difficulties and several attempts may always carry a risk of TEF formation. Clinical suspicion of TEF must be clarified in every case by endoscopic direct evaluation or other appropriate radiological methods such as multislice computed tomography (CT) and magnetic resonance imaging. Existence of TEF indicates early definitive surgical repair. Thus, a multidisciplinary approach with participations of thoracic surgery, pulmonology, radiology and gastroenterology is essential during intensive unit treatment.

Key Words: Iatrogenic, Difficult intubation, Tracheoesophageal fistula

Introduction

We report a case of a rare complication of emergent intubation in a trauma patient; symptomatic tracheoesophageal fistula (TEF).

Case Report

A 53 years old female patient administered to emergency department with a history of accidental fall and cardiopulmonary resuscitation in another medical center. Endotracheal intubation was applied in the same medical center and reported to be difficult airway which was achieved with several attempts. In our initial examination, the electrocardiogram recorded a normal sinus rhythm with 100 heart beats per minute. Bilateral arterial blood pressures were 170/90 mmHg on both sides. Cardiovascular and respiratory examinations were normal, but we observed bilateral extremity perfusion defects with acral cyanosis. Patient's medical history was uneventful, but she was obese with a body mass index (BMI) 37.9 kg/m2.

In neurologic examination; she presented a deeply decreased level of consciousness and irregular shallow respiration. Glasgow coma scale (GCS) was 5/15. In examination of pupillary function, both pupils had equal size and regular shape. Reactivity to light and direct and consensual accommodation of pupils were normal. The remainder of the physical and clinical evaluation was within normal ranges.

Patient was transferred to the intensive care unit from emergency department.

Laboratory blood tests were normal. The chest, neck, abdominal and head radiograph and M-mode echocardiogram were also free of concomitant abnormalities.

Due to persistence of medication resistant worsened neurological status with lower GCS, we applied a cranial computed tomography (CT).

Initial cranial CT (Figure 1) presented a deep parenchymal hemorrhage at the putamen, globus pallidum with occipital lobe edema.

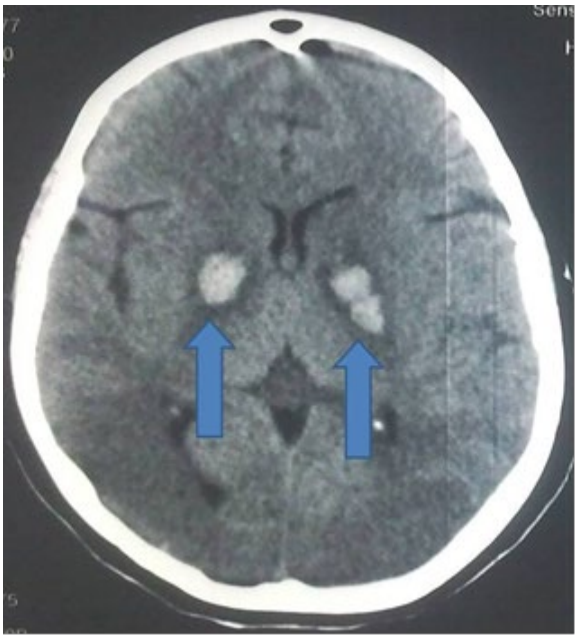

Figure 1 Cranial CT, arrows showing deep parenchymal hemorrhage

On the other hand, we observed an excessive amount of liquid drainage from tracheal aspiration at the sixth day of treatment. This liquid aspiration material also warned us for a suspicion of gastric juice/gastric feeding ingredients. Thus, we performed an endoscopic examination of trachea to clarify a possible fistula existence. This evaluation proved proximally located two different TEFs which we believed to form a passage from stomach to tracheal/pulmonary side (Figure 2).

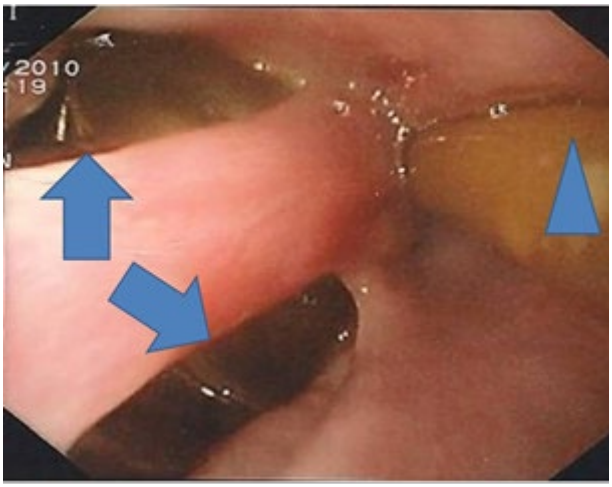

Figure 2 Tracheo esophageal fistula view by endoscopic evaluation, arrows showing two large posttraumatic TEF. Arrowhead showing yellow nasogastric tube along the esophagus.

Thoracic surgery consultation for this fistula resulted with a non-surgical/medical follow-up process due to patient's severely deteriorated neurological status. Elective surgery was planned for a later time.

At the seventh day, following endoscopic viewing, we applied a tracheostomy cannula for prolonged intubation of the patient to prevent a risk of aspiration pneumonia. We believe that tracheostomy cannula produced a total closure of fistula passage by a direct or a compression effect. However, a pulmonary infection with Gram positive and Gram-negative colonization by tracheal aspirate culture occurred. During the follow-up, we observed a certain response to combination antibiotic therapy.

Patient's neurological status developed a great healing, gradually. Afterwards, patient was transferred to thoracic surgery department with her tracheostomy cannula in a condition free of neurological and pulmonary sequelae by a month of treatment.

Discussion

TEF is defined in two main categories as congenital and acquired cases. Congenital cases are esophageal atresia associated malformations which are diagnosed immediately after birth and/or in infancy by definitively life-threatening complications. These unfortunate children often carry a burden other congenital comorbidity such as Down syndrome, genitourinary and/or gastrointestinal system abnormalities[1,2].

As in our case, acquired TEF is generally thought to occur by several conditions such as primary and/or metastatic malignant diseases, acute and/or chronic infections, underlying comorbidities as tracheomalacia, severe gastroesophageal reflux, dysphagia, caustic irritation, prolonged mechanical ventilation,

tracheostomy attempts, central venous catheter insertion, complicated diverticula, especially tunneled hemodialysis catheter insertions, anti-neoplastic medication and radiotherapy courses and direct trauma. A major part of the latter cause is reported to be as a complication of iatrogenic cases. On the other hand, blunt or avulsion trauma of the relevant anatomical structures may also produce a TEF immediately or after a particular delay [3,4].

Iatrogenic trauma is frequently caused by intubation technique and endotracheal intubation conditions. The latter factor may include prolonged mechanical ventilation, excessively inflated cuff of endotracheal tube and mismatch of endotracheal tube size. Furthermore, a rigid and careless application of a nasogastric tube may also cause a TEF in cases which are already in a worsened clinical situation by means of infection, steroid administration and malignant conditions[5,6].

Administration of tracheostomy cannula is another predisposing and frequent reason of TEF. Incidence is reported to be approximately in 0.5-1% of all tracheostomy attempts.

However, other iatrogenic TEFs are not common and incidence rates are generally not elaborately documented by medical reports[7]. But elderly patients may present a higher tendency to have TEF.

Intubation difficulties and multiple attempts are also causes of TEF, as in our case. Direct trauma resulting with partial rupture of anatomical layers and tracheal necrosis predispose a connection to esophageal lumen. However, it is not to state the percentage of cases caused by this mechanism among all acquired TEF patients. We believe that this condition is quite rare when compared to other reasons such as excessive cuff pressure, prolonged ventilation or direct catheter insertion related situations. Nevertheless, excessive amounts of secretion with tracheal aspiration, gastric content during this manipulation, massive existence of gastric air despite a replacement of a nasogastric tube should alert us for a TEF formation especially for cases with higher IDS scores. Unsuccessful multiple endotracheal intubation attempts may also present a strong association with intubation induced TEFs.

Diagnosis of TEF, especially for congenital cases, is an indication for surgery. However, acquired TEFs may have another option for non-surgical close follow-up to be able to avoid the life-threatening complications of surgery in small connections. In a symptomatic case, it is essential to prevent reflux of acidic gastric content to tracheal side. In this conservative treatment choice, a tracheostomy replacement, elevation of the patient bed caudally, nasogastric tube applications to reduce gastric volume by gastric decompression and additive intravenous feeding solutions are suggested.

In our case, we preferred this conservative treatment before elective surgery by the thoracic surgery consultation. There were two main reasons for this medical treatment tendency; hemodynamical instability and neurological status of the patient. However, administration of tracheostomy resulted with an unexpected fortunate result; certain reduction of TEF related clinical features. Afterwards, we were lucky enough to transfer the patient to thoracic surgery department. We believe that TEF definitely require a surgical repair for an acceptable clinical result. On the other hand, surgery also has long-term complications such as re-TEF, tracheal stenosis and esophagitis, hiatal hernia and pulmonary tractus strictures. An esophageal endoprothesis is also applicable for selected patients[8].

Conclusion

As a conclusion, especially for trauma patients, intubation difficulties and several attempts may always carry a risk of TEF formation. Clinical suspicion of TEF must be clarified in every case by endoscopic direct evaluation or other appropriate diagnostic radiological workups such as multislice CT and magnetic resonance imaging. Existence of TEF indicates early definitive surgical repair. Thus, a multidisciplinary approach with participations of thoracic surgery, pulmonology, radiology and gastroenterology is essential during intensive unit treatment.

References

1.Dogan BE, Fitoz S, Atasoy Cet al. Tracheoesophageal fistula: demonstration of recurrence by three-dimensional computed tomography. Curr Probl Diagn Radiol. 2005;34(4):167-9. http://dx.doi.org/10.1067/j.cpradiol.2005.04.005

2.Bakan M. Anesthesia in a newborn with Klippel-Feil syndrome. Rev Bras Anestesiol. 2017;67(6):665-6. http://dx.doi.org/10.1016/j.bjane.2017.04.003

3.Gerwat J, Bryce DP. Management of traumatic tracheoesophageal fistula. Arch Otolaryngol. Jan 1975;101(1):67-70. http://dx.doi.org/10.1001/archotol.1975.00780300071019

4.Neale HW, Main FB. Acquired tracheoesophageal fistula: A formidable complication of continued respiratory assistance. South Med J. 1974;67(9):1102-4.

5.Reed MF. Tracheoesophageal fistula Chest Surg Clin N Am 2003;13:271-89. http://dx.doi.org/10.1016/s1052-3359(03)00030-9

6.Gedik AH, Çakır E, Topuz U. Flexible Fiberoptic Bronchoscopy Through the Laryngeal Mask Airway in a Small Premature Infant. Turk Thorac J. 2016;17(1):32-4. http://dx.doi.org/10.5578/ttj.17.1.006

7.Salihoglu Z, Umutoglu T, Bakan M. Risk criteria for scientific researches. For whom the bell tolls? J Gastrointest Surg. 2014;18(9):1720. https://doi.org/10.1007/s11605-014-2578-1

8.Harley HR. Ulcerative tracheo-oesophageal fistula during treatment by tracheostomy and intermittent positive pressure ventilation. Thorax. 1972;27(3):338-52. http://dx.doi.org/10.1136/thx.27.3.338