

CAS CLINIQUE / CASE REPORT

INTRACTABLE COURSE OF A SUBMANDIBULAR ABSCESS FOLLOWING DIFFICULT ENDOTRACHEAL INTUBATION

A Case Report

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Ayoub E, Tohme J, Abi Lutfallah A, Jabbour H, Chalhoub V, Naccache N. Intractable course of a submandibular abscess following difficult endotracheal intubation. A case report. J Med Liban 2019; 67 (2): 103-106.

ABSTRACT • Purpose: Failure to manage airway might lead to severe life-threatening events. Oral and pharyngeal perforation and subsequent peripharyngeal abscess formation is a perilous complication of tracheal intubation. We present the case of a difficult endotracheal intubation and delayed recognition of an associated tear in the floor of the mouth in a patient undergoing a minor surgery. We also describe the management of subsequent submandibular abscess. **Clinical features:** A 24-year-old male was scheduled for strabismus surgery. He was classified as Mallampati class III. Endotracheal intubation was achieved at the third attempt, using the D-Blade™ of a C-MAC™ with a stylet. Five hours after uneventful extubation, the patient complained of sore throat and a mild neck pain. He was however discharged from hospital against medical advice. Two days later, the patient presented to the emergency department after experiencing increased neck pain, odynophagia and a 39°C fever. Computed tomography scan revealed a right submandibular abscess. He was transferred to the OR for abscess drainage. Because no fiberoptic was available at the time of induction, intubation was attempted using a C-MAC™ video laryngoscope. However, the abscess drained in the oral cavity. Facing difficulties to ventilate, an emergent tracheotomy was performed immediately. A tear in the floor of the mouth was identified and was surgically repaired. The patient received adequate antibiotics and fully recovered twelve days later. **Conclusion:** In rare cases, endotracheal intubation may lead to life-threatening pharyngoesophageal complications. Therefore, anesthesiologists must be aware of such injuries because early detection is a cornerstone to successful management of these complications.

Keywords : submandibular abscess; difficult intubation; abscess drainage; floor of the mouth

INTRODUCTION

The incidence of a difficult airway intubation is relatively low and is reported to occur in 1 to 5.8% of patients [1-3]. However, failure to manage an airway might lead to severe life-threatening events including cerebral anoxia and cardio-respiratory arrest [4]. Healthcare providers,

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RÉSUMÉ • Objectif: Ne pas pouvoir sécuriser les voies aériennes peut avoir des conséquences redoutables menaçant la vie. Une plaie du plancher buccal et par conséquent la formation d'un abcès sous-mandibulaire, est une complication périlleuse de l'intubation trachéale. Nous présentons le cas d'une intubation endotrachéale difficile avec un retard de diagnostic d'une plaie du plancher buccal chez un patient qui devait être opéré d'une chirurgie mineure. Nous décrivons par la suite la prise en charge de l'abcès sous-mandibulaire subséquent. **Présentation clinique:** Un jeune homme de 24 ans programmé pour une chirurgie de strabisme. L'examen clinique a montré un score de Mallampati III. L'intubation endotrachéale a été réussie à la 3^e tentative, à l'aide d'un C-MAC™ avec une lame D-Blade™ et un mandrin. L'extubation s'est déroulée sans problème. Cinq heures plus tard, le patient s'est plaint d'une irritation à la gorge avec douleur au niveau du cou. Cependant, il a quitté l'hôpital contre avis médical. Deux jours plus tard, le patient s'est présenté aux urgences pour une douleur importante au niveau du cou avec odynophagie et fièvre à 39°C. Un CT scan cervical a montré un abcès sous-mandibulaire à droite. Il a été transféré au bloc opératoire pour drainage d'abcès. Une intubation a été tentée avec un C-MAC™ vu que le fibroscope n'était pas disponible au moment de l'induction. À l'introduction du C-MAC™, l'abcès s'est drainé dans la cavité orale. Face à des difficultés de ventilation, une trachéotomie a été réalisée immédiatement. Une perforation pharyngée a été identifiée et réparée. Le patient a reçu une antibiothérapie adéquate et a entièrement récupéré 12 jours plus tard. **Conclusion:** Dans de rares cas, l'intubation endotrachéale peut aboutir à des complications orales et pharyngo-œsophagiennes redoutables. Une détection précoce de ces dernières aidera l'anesthésiste à mieux prendre en charge le patient.

Mots-clés : abcès sous-mandibulaire; intubation difficile; drainage d'abcès; plaie du plancher buccal

facing the urgency of securing a patient's airway, may cause several traumatic lesions while performing endotracheal intubation. Those complications might affect all the anatomic structures exposed to the laryngoscope and the endotracheal tube [3,5-6]. They include lip injuries, dental trauma, local scarring, vocal cords laceration or paralysis, arytenoid dislocation and in some severe cases

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aerodigestive tract perforation [5]. Oral or pharyngeal perforations in particular, and subsequent submandibular or peripharyngeal abscess formation, is a rare yet perilous complication of tracheal intubation. Its incidence increases with the number of intubation attempts and is more likely to occur with an inexperienced staff facing an emergent and difficult intubation [7-8].

Early recognition of pharyngeal perforation resulting from tracheal intubation is crucial, as delayed diagnosis can lead to a significant risk of morbidity and mortality [3,7-8]. However, prompt identification of such lesion is not always easy, as in half of the reported cases there were no signs of perforation or injury, and the anesthesia provider considered the intubation to be atraumatic [6-8].

Several authors have reported between 1974 and 2016 oral and pharyngoesophageal perforations and abscess formation after endotracheal intubation. However, the resulting course and management of this rare complication can be highly unpredictable. To our knowledge, none have described the need to perform an urgent tracheotomy during the management of a submandibular and retropharyngeal abscess that occurred following traumatic tracheal intubation.

In this paper, we present the case of a difficult endotracheal intubation and delayed recognition of an associated tear in the floor of the mouth in a patient undergoing strabismus surgery. We also describe the management of subsequent submandibular abscess.

CASE REPORT

This study was conducted after written informed consent was obtained from the patient. A 24-year-old male, with a BMI of 30.4, was scheduled for strabismus surgery. Physical examination showed right eye strabismus. His past medical record included extraocular muscles surgery during infancy. No recent ENT infection was noted. Referring to difficult intubation criteria, he was classified as Mallampati class III.

Following preoxygenation with 100% oxygen, induction was performed using intravenous lidocaine, propofol and fentanyl and IV rocuronium.

A first intubation attempt was performed by a fourth year anesthesia resident using a Macintosh® laryngoscope blade. After having failed to visualize the vocal cords, the patient was ventilated, and afterwards, a second attempt was conducted by an attending anesthesiologist using a C-MAC™ Storz® videolaryngoscope, but he failed to direct the endotracheal tube towards the vocal cords. Finally, on the third attempt, endotracheal intubation was achieved using the D-Blade™ of the C-MAC™ with a stylet that was properly placed in the endotracheal tube. Hydrocortisone 100 mg bolus IV was

administered after intubation to prevent laryngeal edema. Surgical duration was about 65 minutes, and extubation was performed without any complications.

Two hours after observation in the postanesthesia care unit, the patient was returned to the ward. Five hours after extubation, he complained of sore throat and a mild neck pain. He was however discharged from hospital on the same day against medical advice.

Two days after surgery, the patient presented to the emergency department after experiencing increased neck pain, odynophagia and a 39°C fever. Physical examination showed right submandibular tumefaction, drooling and trismus. No dyspnea or dysphonia were noted.

Direct nasofibroscope showed salivary stasis with fill of the right vallecular space, without laryngeal edema. Computed tomography scan of the neck revealed a right submandibular abscess measuring 45 mm in diameter, with infiltration of adipose tissue in the parapharyngeal and retropharyngeal spaces (Figure 1). He was transferred to the OR for abscess drainage.

We decided to go for a nasal intubation, because no fiberscope was available at the time of induction. We introduced the endotracheal tube in the left nostril, under a light sedation using propofol, but after cautiously introducing the laryngoscope blade on the right side, the abscess drained in the oral cavity, resulting in a difficult visualization of laryngeal structures.

Facing oxygen desaturation and difficulties to ventilate, an emergent tracheotomy was performed immediately, under local anesthesia. In fact, before starting the induction, we made sure that the ENT surgeons were

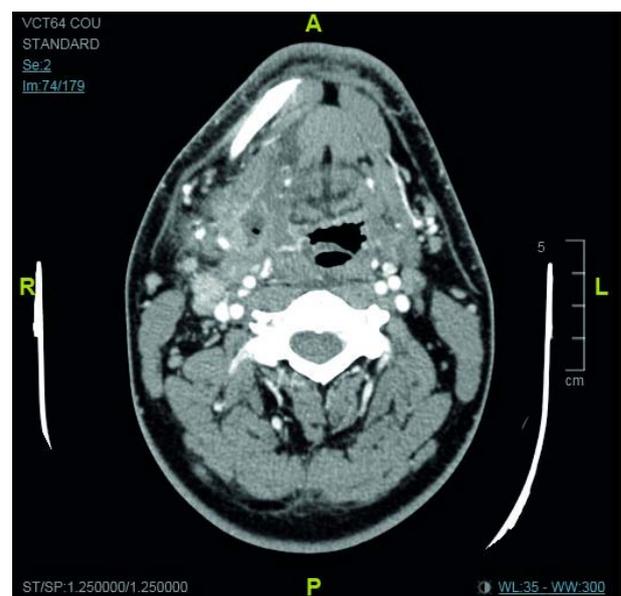


Figure 1

CT Scan of the submandibular abscess with infiltration into the parapharyngeal and retropharyngeal spaces

prepared for the possibility of an emergent tracheotomy. After securing the patient's airway, general anesthesia was started (using lidocaine, sufentanil, propofol and rocuronium). A pharyngeal perforation was identified between the right anterior tonsillar pillar and the tongue, and was surgically repaired after draining the abscess. A nasogastric tube was inserted and the patient was then transferred to the intensive care unit where he was kept NPO and received broad spectrum antibiotics (vancomycin + clindamycin + imipenem).

The culture sent from the drained abscess showed *Staphylococcus aureus* methicillin sensitive so the antibiotics were downgraded to amoxicillin and clavulanic acid. Progressive oral alimentation was introduced at day 4 uneventfully, and a CT scan at day 11 showed complete abscess regression. The patient was discharged home on day 12 after having fully recovered.

DISCUSSION

Endotracheal intubation is used to maintain an open airway during general anesthesia or emergency situations. Complications from prolonged intubation have been widely studied, while acute traumatic injuries associated with laryngoscopy and endotracheal tube insertion have received a relatively recent attention as more cases are reported each year [3]. Aerodigestive tract perforation in particular is a rare, yet serious complication, that needs to be considered and diagnosed promptly by anesthesiologists, as subsequent morbidity and mortality can be significant [5].

Three patient factors are positively correlated to oral and pharyngoesophageal perforation: difficult intubation, age older than 60 years and female gender [3,5]. Other contributing factors include emergent intubation and laryngoscopy being performed by inexperienced personnel. In addition, curved endotracheal tubes and the use of stylets are also incriminated in this aerodigestive tract injury [5,7-8]. Moreover, any situation causing a poor visualization of the vocal cords and leading to blind intubation attempts was found to be a contributing factor; such situations include improper patient positioning, poor muscle relaxation and secretions in the airway [7-8]. Note that some authors have also reported pharyngeal injury and retropharyngeal abscess following a laryngeal mask airway insertion [9].

In the present case, we encountered several of the above-listed risk factors: in fact, it was a difficult intubation (Mallampati III, Cormack III) with three attempts to intubate, and the stylet was used at the third attempt of intubation (despite the fact that it was properly placed in the endotracheal tube). A C-MAC™ Storz® video laryngoscope could have been used from the beginning before

any blind attempts of insertion of the endotracheal tube, since the patient had a Mallampati score of III. On the other hand, in order to rule out the idea that abscess formation was related to immunosuppression, it is important to note that the patient had a normal dentition and no lesions were noted in the oral cavity. Also, viral serology testing was performed and turned out to be negative.

Moreover, to prevent desaturation, the patient was ventilated between the multiple attempts of intubation. Despite the fact that there were no signs of lesions following intubation (no blood was noted at the tip of the laryngoscope blade or the endotracheal tube after extubation), minimal lesions could have occurred and could have been aggravated by face mask ventilation. In fact, in case of an airway perforation and in combination with manual ventilation, air might enter unusual locations in the neck and chest, leading to neck crepitation and subcutaneous emphysema, pneumothorax or pneumomediastinum associated with early nonspecific signs such as sore throat, cervical pain, dyspnea, and chest pain [3,10-11]. In case of delayed diagnosis, fever, odynophagia and dysphagia may follow, reflecting additional infections including cervical or retropharyngeal abscess, pneumonia and mediastinitis [10,11]. In the present case, facing manifestations such as sore throat and neck pain, our patient should have been kept in the hospital and evaluated by ENT surgeons. However, he decided to leave following surgery against medical advice.

Whenever an oral or pharyngoesophageal perforation is detected, broad spectrum antibiotics should be administered intravenously promptly [12-13]. Oral feeding is prohibited, and parenteral nutrition is initiated concomitantly. Many patients have been found responsive to this conservative treatment [12-14]. In case of evidence of abscessation or sepsis, surgical repair of the perforation and drainage of neck or mediastinal abscesses are indicated, which was the case of our patient. When facing an unstable or compromised airway, tracheostomy and surgical exploration of lesions is strongly suggested [12-14]. Whatever the case, a multidisciplinary evaluation and management is recommended; otolaryngologist, anesthesiologist, infectious disease specialist and, in some cases, thoracic surgeon, should be consulted without any delay. Despite proper preplanning, the course of management might be unpredictable in some rare situations; in the present case, our patient had undergone an attempt of nasal intubation using oral video laryngoscopy secondary to which the abscess drained in the oral cavity. In fact, the endotracheal tube was inserted in the left nostril, but the laryngoscope blade was introduced on the right side, and shortly afterwards the abscess drained. This turning of events could have been avoided if fiberoptic intubation had been performed as described by Raval *et*

al. [15]. But no fiberscope was available at the time of induction. On the other hand, we thought about introducing the laryngoscope blade on the left side since the abscess was located on the right, but this could have resulted in a difficult intubation and possibly also drainage of the abscess.

It is important to note that there are no established guidelines describing the course of action to be taken when facing a retropharyngeal abscess following aerodigestive tract perforation.

CONCLUSION

Endotracheal intubation is a seemingly innocuous maneuver that is widely encountered. However, in some rare cases, it may lead to pharyngoesophageal complications that can be life-threatening with poorest outcomes when diagnosis and treatment are delayed [5,7-8]. Even professional anesthesiologists are at risk of encountering complications in situations of difficult intubation. Therefore, anesthesiologists must be aware of such injuries because early detection is a cornerstone to successful management of oral and pharyngoesophageal complications.

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