OLGU SUNUMU CASE REPORT

Complete Upper Airway Obstruction After Adenotonsillectomy

Adenotonsillektomiden Sonra Üst Hava Yolunun Tamamen Tıkanması

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ABSTRACT We reported two cases about sudden and complete obstruction of upper airway with cotton pocket after adenotonsillectomy. The operations were performed successfully under general anesthesia in typical method by otorhinolaringologist. After the termination of general anaesthesia and extubation, we noticed that the patients were (not being able) unable to ventilate suddenly. They had significant stridor and chest wall retractions. It was suspected of any foreign body in the airway and patients were replaced immediately to the lateral-trendelenburg position. Heimlich maneuver and slapping on the upper back were performed for each patient. A cotton pocket was taken out carefully when easily seen in the mouth of patients and subsequently, they were ventilated successfully. We advise that some maneuvers such as Heimlich and slapping on the upper back, which may be life saving should be taken immediately if there is a suspect of foreign body, which is forgotten in the airway accidentally.

Key Words: Airway obstruction; adenoidectomy

ÖZET Adenotonsillektomiden sonra; pamuk topu ile meydana gelen, ani ve tam hava yolu tıkanıklığı ile ilgili iki vaka rapor ettik. Operasyonlar kulak- burun- boğaz uzmanı tarafından tipik metodla genel anestezi altında başarı ile uygulandı. Genel anestezi bitiminden ve ekstubasyondan sonra hastaların aniden soluyamadığını gözlemledik. Hastalarda dikkate değer bir şekilde stridor ve göğüs duvarı çekilmeleri vardı. Hava yolunda bir yabancı cisimden şüphelenildi ve hastalar hemen lateral-trendelenburg pozisyonuna alındı. Her hastanın sırtının üst tarafına vurma ve Heimlich manevrası uygulandı. Hastaların ağzında görülür hale gelen pamuk topu dikkatli bir şekilde dışarı alındı ve hastalar başarı ile ventile edildi. Biz, havayolunda kazara unutulan yabancı bir cismin olduğu şüphesinde Heimlich ve üst sırta vurma gibi hayat kurtarıcı olabilen manevraların uygulanmasını tavsiye ediyoruz.

Anahtar Kelimeler: Havayolu obstrüksiyonu; adenoidektomi

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Upper airway problems are important in the development of preoperative mortality and morbidity. Coughing, stridor or laryngospasm may be seen because of the excessive mucous production during postoperative period and all these symptoms may result in transient hypoxia and prolonged time in the operating room. Some different materials such as gauze tampon and cotton pockets, which are used for avoiding from bleeding and oozing, have been used in operations. They also may lead to upper or lower airway obstructions. Cotton pockets are frequently used in adenotonsillectomy operations for haemostatic purposes (Figure 1). Their

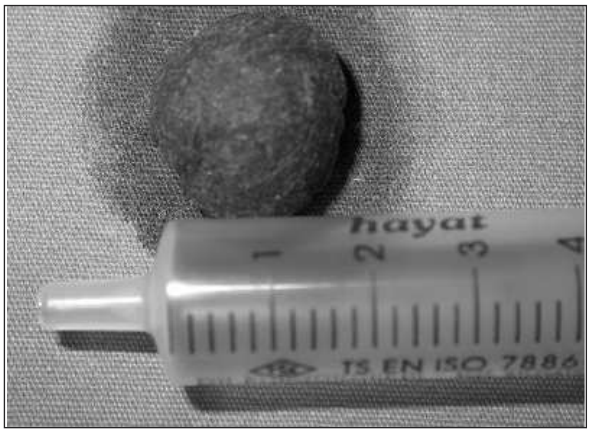

FIGURE 1: Cotton pocket

size varies from a nut to a small walnut. They are generally made of sterilized cotton and have been used by otorhinolaryngologists for years. We were not able to find out any report about a cotton pocket causing difficulties in ventilation in English literature. We report of two cases that developed complete upper airway obstruction and we could not ventilate after extubation.

CASE REPORTS

7-year-old male and 5-year-old female children with no previous history of respiratory problems were admitted to hospital for adenotonsillectomy operation. On the initial evaluation, there was no cough, wheeze, stridor or tachypnea. Physical examination revealed normal mouth opening with easy visualization of oropharyngeal structures and normal neck extension. The cardio-respiratory examination was normal. No premedication was used. After arrival in the operating room and monitorization, anesthesia was induced with 8% sevoflurane with oxygen and nitrous oxide using a circle system. A 22-gauge catheter was settled on the dorsum of the hand. We administered succinylcholine (Lysthenon, Fako, Turkey) 2mg kg^{-1} and entubated them with cuffed endotracheal tubes.

The adenotonsillectomy was performed for both patients by otorhinolaringologist. Patients who were underwent adeonotonsillectomy with typical sharp dissection procedures under general anesthesia. Haemostasis was maintained with electrocautery and surgical suture and cotton pockets. No otolaryngological or anaesthetical problem was occurred during operation. Counting of the cotton pockets was completed after adenotonsillectomy. There was no unexpected condition about the cotton pockets whether one of them was forgotten in the child's mouth or not. After the surgical procedure, sevoflurane was stopped, and nitrous oxide administered with 100% oxygen at the level of 6 lt/min flow. When their spontaneous respiration started, patients were extubated with aspiration of upper airway. After extubation vital signs were normal. Their airways were clear and they were breathing easily. Their initial oxygen saturations were 99%. Heart rates were 94 beat/min (male child), 110 beat/min (female child), respiratory rates were 18/min (male child), 20/min (female child). After this, marked inspiratory stridor and sternal retraction developed suddenly. There was no breath sounds bilaterally. Manual ventilation was not possible. Airway maneuvers including jaw thrust, chin lift, mouth opening, aspirating upper airway were not sufficient to open the obstructed airway. The mouth was checked again for a foreign body and laryngoscopy was performed. But nothing was seen in the upper airway. So it was thought that there could be a foreign body at the lower respiratory tract.

Oxygen saturation was decreased below 85%, cyanosis and tachycardia (> 125 beat/min) were occurred in both of them. As the clinical status deteriorated quickly, no further diagnostic investigations performed. We placed them in the supine- trendelenburg position immediately and aspirated upper airway and applied direct laryngoscopy. We were unable to see anything as a foreign body. The first maneuver we applied was Heimlich Maneuver. We performed abdominal thrusts and placed them lateral position and performed strong four back blows. The patients' oxygen saturation was subsequently improved to 98% in a few minutes. At the same time a cotton pocket was appeared from the children's mouth. After checking the vital signs, oxygen saturation increased to 99%, heart rates were 83 beat/min (male child), 92 beat/min (female child) and their respiratory rates were 16/min (male child), 20/min (female child). We re-

moved the cotton pocket slowly from the mouth. It was realized that cotton pocket counting was incomplete. Both patients were administered intravenous antibiotics and high dose (3mg/kg) metilprednisolone (Prednol-L, Mustafa Nevzat, Turkey) in order to prevent edema and infection in respiratory tract. Chest X-ray examinations were completely normal in both children. Postoperatively, the patients were transferred to the postoperative care unit. Both of them were treated with the same methods and they were discharged at 24.th hour of postoperative period.

DİSCUSSİON

Both cases of laryngeal foreign body highlight the difficulties in diagnosing complete laryngeal obstruction. Complete laryngeal or tracheal obstruction may cause serious respiratory complications. There may be ongoing cough, wheeze, stridor or tachypnea. Such a foreign body aspirations can lead to significant pulmonary complications and can be fatal in this kind of cases. In a review of 20 cases of laryngotracheal foreign bodies, Esclamado and Richardson[1] reported that the most common presenting symptoms were stridor, wheezing, sternal recession and cough. In our cases there were some of those symptoms such as sudden stridor, sternal recession, and respiratory blockage. Suddenly unexpected airway obstruction at the induction of anesthesia in infants and children has been reported widely.[2] Among the causes are supraglottic cysts[3] and aneurysms.[4] Lingual tonsil hypertrophy (LTH) has been reported as a cause of unanticipated inability to ventilate or intubate anesthetized child.[2] Signs in a young child with sudden onset stridor mean that consideration of inhaled laryngeal foreign body is essential. The lodgment of particulate material in the larynx is potentially life threatening as complete obstruction of this region.[5] A diagnostic algorithm for cases of suspected aspirated foreign body, advises inspiratory and expiratory chest X-ray examinations. So in the suspicion of intrapulmonary foreign body, radiological assessment of all aspects of the airway from the nasopharynx to the lower area of lung fields is essential.[6]

In both cases, the clinical status deteriorated quickly that was impossible to perform radiological assessment in order to see the upper airway obstruction. When sudden respiratory tract obstruction was occurred, we first decided to perform direct laryngoscopy. We did not detect any foreign body with direct laryngoscopy. As we suspected from lower respiratory tract obstruction, we performed Heimlich Maneuver and back blows. After dislodging foreign material from the respiratory tract via Heimlich Maneuver, chest X-rays were performed and they showed completely normal airway and lung structure. Although cotton pocket aspiration is a rare seen surgical complication, it may be life threatening and may lead to morbidity and mortality. In the cases presented here, to avoid the complications of cotton pocket aspiration they may be labeled before using for tonsillar fossae packing or these instruments may be tied to a suture to be checked easily, or cotton pockets may be prepared bigger shape so that it becomes difficult to be aspirated into the respiratory tract and can be seen easily. In addition, these instruments should be counted cautiously before and after application, or adenotonsillectomy may be performed with local anesthesia if the physical condition is inappropriate. Careful observation and frequent assessment play an important role in operations such as adenotonsillectomy.

The Heimlich Maneuver is a life-saving technique for dislodging foreign material from the respiratory tract. The Heimlich Maneuver involves an externally applied sharp compressive upward abdominal force, causing displacement of the diaphragm and a sudden increase in intrathoracic pressure. It causes sudden expiration of residual intrapulmonary air and thus dislodges food or other foreign material from the respiratory tract.[7] In 1974 Dr. Henry Heimlich suggested a technique for relieving a cafe coronary.[8] The Heimlich Maneuver is widely used and remarkably successful at relieving upper airway obstruction.[9] The maneuver can be performed safely with the subject in a supine position,[8,10] as long as the rescuer's hands are positioned correctly. As in our

cases, laryngeal obstruction was successfully relieved with Heimlich Maneuver in the supine position and slapping on the back in the lateral-Trendelenburg position.[10] Hammer et al. describes most pathologic processes that result in upper airway compromise are the consequence of infection, trauma or aspiration. Prompt recognition and appropriate management of the child presenting with upper airway obstruction are remained critical, because certain causes can progress rapidly from a mild to a potentially life threatening disease state.[11]

Dr. R. K. Haugen first coined the term "cafe coronary" in 1963 to describe sudden death after aspiration of pieces of meat into the trachea. Early suggestions for emergent treatment of upper airway obstruction ranged from finger-probe maneuvers and use of mechanical devices to remove the object from airway, to slap on the back.[12] Experimental data including both animals and humans tend to support this concept and suggest back blows maneuver, which generate high initial pressure, may dislodge foreign bodies from larynx as we did in our cases.

If it was impossible to dislodge the foreign body by Heimlich Maneuver, bronchoscopy might have been scheduled. An expert should perform bronchoscopy in order to avoid lethal complications. Dibiase et al. concluded that if an object is inhaled in the respiratory tract, we should attempt dislodgement with back blows and Heimlich Maneuver. We may come across many complications during upper airway attempt.[13]

Despite the otolaryngologist's efforts to prevent the complications, hemorrhage is the most common, significant complication of tonsillectomy.[14] Colclasure and Graham studied over 3000 patients undergoing adenotonsillectomy and reported a major complication rate of 1.4 % which comprises hemorrhage, anesthetic complications, dehydration and severe nausea.[15] Inflammatory responses, such as mild edema of the respiratory tracheobronchitis or granulation tissue may occur during upper airway obstruction.[11]

Complications including successful foreign body removal are rare. No case of cotton pocket aspiration was reported before.

In conclusion, we describe two cases of sudden airway collapse during extubation. At the end of the operation procedure, a forgotten foreign body in the airway may cause fatal airway obstruction. Therefore, some preventive measures should be taken during adenotonsillectomy and Heimlich maneuver should be performed immediately during complete or incomplete laryngeal obstruction due to foreign bodies, which were forgotten accidentally.

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