

Laryngeal Mask Airway in The Management of a Difficult Pediatric Airway

Case Report

Pediyatrik Hastada Zor Havayolu Yönetiminde Laringeal Maske

Olgu Sunumu

Serap Karacalar, Assist.Prof.Dr.

*Department of Oral, Dental and Jaw Surgery
Yeditepe University of Dentistry*

Sinan Atmaca, Assist.Prof.Dr.

*Department of Otorhinolaryngology
Ondokuz Mayıs University Medical Faculty*

Sibel Barış, Assoc.Prof. Dr.

*Department of Anaesthesiology and Reanimation
Ondokuz Mayıs University Medical Faculty*

Corresponding Author

Serap KARACALAR, Assist.Prof.Dr.

*Department of Oral, Dental and Jaw Surgery
Yeditepe University of Dentistry
E-mail: skaracalar@yahoo.com*

ABSTRACT

Difficult endotracheal intubation is a rare situation. Here we report a difficult endotracheal intubation case in a three year-old girl with chronic lung disease and severe pneumonia who was admitted to our paediatric intensive care unit. Since the patient could not be intubated and effectively ventilated by the standart methods, a size 2 LMA was inserted. In this case, LMA provided a good airway control and effective ventilation

Keywords: *Difficult intubation, laryngeal mask, pediatric patient*

ÖZET

Zor endotrakeal entübasyon seyrek olarak görülür. Bu sunumda kronik akciğer hastalığı ve pnömonisi nedeniyle pediatrik yoğun bakım servisine kabul edilen ve endotrakeal entübasyon güçlüğü ile karşılaşılan 3 yaşındaki çocuk hasta rapor edildi. Hasta standart metodlarla entübe edilemediği ve yeterli ventilasyon sağlanamadığı için, 2 numara LMA yerleştirildi. Havayolu kontrolü sağlanarak etkin ventilasyona başlandı.

Anahtar Kelimeler: *Zor entübasyon, laringeal maske, pediyatrik hasta*

INTRODUCTION

Classic laryngeal mask airway was reported to be a rescue technique in more than 90% of the can't intubate can't ventilate (CICV) cases (1). Its use in difficult airway management is specifically advised in the guidelines for CICV (2). Here we report our experience with a 3 year-old girl whose airway management was difficult.

CASE REPORT

A 3-year-old girl suffering from shortness of breath since birth was admitted to the pediatric critical care. She was found to have progressive respiratory distress. She had not diagnosed of any genetic disease. Physical examination done after the incident revealed micrognathia, retrognathia, Mallampati score of III. The distance between the tip of the patient's mandible and hyoid bone was 4.5 cm, and the sternomental distance was 6 cm. Respiratory rate was 39/min, with severe suprasternal and subcostal retraction. Despite being given high-flow oxygen, she still had progressive respiratory distress. Endotracheal intubation was decided because of her deteriorating respiratory status. Following unsuccessful intubation attempts by pediatricians, ventilation pattern and arterial blood gas values became worse. The pediatric consultant called for urgent help from the anesthesia department and also from ear-nose-throat department. When we arrived to the pediatric critical care ward, arterial blood gas values were as follows: pH 7.18, PaCO₂ 68.9 mmHg and PaO₂ 40 mmHg. A further laryngoscopy attempt performed by the anesthesiology team was also failed. Then, the ventilation was impossible and the patient became further desaturated. A LMA size 2 was inserted at the first attempt and the cuff was inflated.



The airway was immediately re-established, the patient was successfully ventilated and rapidly re-oxygenated. The ear-nose-throat consultant recommended tracheostomy. The patient was taken to the operating room while ventilating through the LMA. LMA was taken out, the intubation attempt using pediatric fiberoptic bronchoscopy was failed. LMA was inserted again. Tracheostomy tube was inserted under general anesthesia while the LMA was in place. The patient was sent to the ward with stable vital signs, normal PaCO₂ (38 mm Hg) and PaO₂ (98 mmHg) levels at the end of the surgery. Her neurological examination was revealed as normal.



DISCUSSION

Since its introduction by Brain (3) the laryngeal mask airway has gained widespread popularity among anesthesiologists (4). In the management of difficult airways LMA has been extensively used (5). The decision to insert a LMA when tracheal intubation and mask ventilation had failed may be criticised. Some would support immediate tracheal access (6). The laryngeal mask airway rescues the CICV situation in more than 90% of cases (1). It has a lower complication rate, and can be easily inserted without a laryngoscope or guide (7); that's why we decided to insert a LMA when tracheal intubation and mask ventilation had failed in this patient. It was also reported that it is faster to provide an airway patency with a LMA than any form of direct tracheal access and lower complication rate (7). Kremer et al. reported that the tracheostomy related complications had not changed significantly (8). The most frequent early complications were pneumomediastinum, pneumothorax, wound complications and bleedings (8). It was also reported that except for the emergency conditions, pediatric tracheostomy should be performed in the operating room with the child intubated (9). In this case due to the desaturation and impossible mask ventilation a LMA was immediately and provided a successful ventilation until tracheostomy. In the light of these literature we believe that the correct decision was made. If insertion of the LMA had not resolved the airway problem, our next step would have been immediate cricothyroidotomy.

Yao et al.(7) reported a case of neonate with Pierre-Robin syndrome (PRS) who had a severe airway obstruction, and had complications of pneumothorax, subcutaneous emphysema, and hypoxaemia due to difficult tracheal intubation. These authors reported that she had respiratory failure immediately after extubation and she could have been resuscitated by inserting a laryngeal mask

airway. The laryngeal mask airway was kept in place for 6 days and eliminated the need for invasive surgical procedures (6).

Proseal Laryngeal mask airway (PLMA) might have also been used in this case. The Proseal Laryngeal mask airway is a modification of the classic laryngeal mask airway that has been available since 2000 (3). It was designed to facilitate controlled ventilation and enable separation of the respiratory and gastrointestinal tracts (3). The most often quoted criticism of the PLMA is difficulty with insertion. There are several trials comparing insertion success between classic LMA and PLMA (3, 10-12).

It was reported that the insertion success rate at first attempt was lower with PLMA than classic LMA (10-12). In our patient we considered that the success at first attempt was important, and we decided to insert a classic LMA at first. LMA was inserted successfully and rescued the patient's life. The patient's recovery was uneventful.

In conclusion, classic LMA is of great importance in the failed emergency intubation situations. LMA and other supraglottic airway rescue devices should be kept ready in intensive care units and all of the clinicians should learn how to use these devices.

REFERENCES

- 1) Parmet JL, Colonna-Romano P, Horrow JC, Miller F, Gonzales J, Rosenberg H. The laryngeal mask airway reliably provides rescue ventilation in cases of unanticipated difficult tracheal intubation along with difficult mask ventilation. *Anesthesia and Analgesia* 1998; 87:661-5.
- 2) Henderson JJ, Popat MT, Latto Ip, Pearce AC, Difficult Airway Society guidelines for management of the unanticipated difficult intubation. *Anaesthesia* 2004; 59:675-94.
- 3) Brain AIJ. The laryngeal mask-a new concept in airway management. *Br J Anaesth* 1983;55:801-5.
- 4) Kendirli T, İnce E, Kavaz A, Çiftçi E, Alanoğlu Z, Doğru U. Difficult intubation of a child through laryngeal mask airway with two tracheal tubes. *Acta Paediatrica* 2006; 95: 1688-1696.
- 5) Shung J, Avidan MS, Ing R, Klein DC, Pott L. Awake intubation of the difficult airway with the intubating laryngeal mask airway. *Anaesthesia* 1998;53:645-9.
- 6) Cook TM, Brooks TS, Van der Westhuizen J, Clarke M. The ProSeal LMA is a useful rescue device during failed rapid sequence intubation: two additional cases. *Can J Anaesth.* 2005 Jun-Jul;52(6):630-3.
- 7) Yao CT, Wang JN, Tai YT, Tsai TY, Wu JM. Successful management of a neonate with Pierre-Robin syndrome and severe upper airway obstruction by long term placement of a laryngeal mask airway. *Resuscitation.* 2004 Apr;61(1):97-9.
- 8) B Kremer, AI Botos-Kremer, HE Eckel, G. Schlondorff. Indications, Complications, and Surgical Techniques for Pediatric Tracheostomies-An Update. *Journal of Pediatric Surgery*, 2002; 37:1556-1562.
- 9) Fraga JC, de Souza JC, Krueel J. Pediatric tracheostomy. *J Pediatr (Rio J).* 2009;85(2):97-103.
- 10) Keller C, Brimacombe J. Mucosal pressure and oropharyngeal leak pressure with the ProSeal versus laryngeal mask airway in anaesthetized paralyzed patients. *British Journal of Anaesthesia* 2000; 85: 262-6.
- 11) Brimacombe J, Keller C. The ProSeal laryngeal mask airway. A randomized crossover study with the standard laryngeal mask airway in paralyzed anesthetized patients. *Anesthesiology* 2000; 93: 104-9.
- 12) Cook TM, Nolan JP, Verghese C. RCT of the ProSeal with the classic LMA in unparalysed patients. *British Journal of Anaesthesia* 2002; 88: 527-33.