Case Report
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Antegrade airway catheterization, an alternative to endotracheal intubation in the severe patient with mixed respiratory failure and septic shock. report of 2 cases

Abstract

For airway management there are multiple techniques and alternatives for the administration of oxygen in unusual conditions and situations, anterograde airway catheterization, is an alternative in case such as severe or anticipated severe subglottic stenosis, as well as In scenarios where, due to the wishes of the patient and/or family, endotracheal intubation cannot be performed, or the patient's poor prognosis in the face of positive pressure such as the cases presented, it may be an option for the administration of oxygen at an infraglottic level.

Keywords: airway catheterization, subglottic stenosis, airway

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Adrian Vazquez Lesso
General Director of the EMIVA program, Evaluation and integral management of the airway in the critical international patient, EMIVA International Scientific Society, Mexico

Correspondence: Adrian Vazquez Lesso, General Director of the EMIVA program, Evaluation and integral management of the airway in the critical international patient, EMIVA International Scientific Society, Resuscitation unit, Emergency service, Regional General Hospital, No.1 Dr. Carlos MacGregor Sánchez Navarro, IMSS, Mexico City, Mexico, Tel 5543530312, Email emergency1adrian@hotmail.com

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Introduction

The management of the serious patient, in many occasions is conditioned to the quantity and type of resources that are counted in the different hospital units, as well as the wishes on the attention that the patients and/or relatives established before the medical personnel. The main goal of emergency care for a serious patient is to stabilize the hemodynamic conditions of the patient, ensuring that they provide a better prognosis in the short, medium and long term. The management of the airway in severe patients goes beyond placing a tracheal tube, in fact it is to improve the oxygenation and perfusion of the patient in adequate parameters, there are different methods to achieve this goal, however in the absence of some alternatives or the patient's wishes on several occasions it is necessary to present different options to achieve this goal.

Two cases are presented in which, before the relatives' wishes, an alternative technique was used at the glottal level for the delivery of supplemental oxygen, which was effective in raising oxygen saturation, optimizing the global conditions of these patients.

Case presentation 1

85-year-old male patient with a history of COPD, cerebral vascular disease, systemic arterial hypertension, type 2 diabetes mellitus, whose reason for admission to the resuscitation area was septic shock of urinary focus refractory to management with meropenem and hemodynamic support with norepinephrine in continuous infusion pump, maintaining BP (blood pressure) of 80/50, MAP (Mean arterial pressure) of 60, oxygen saturation of 71% with non-recirculating reservoir mask, temperature of 36.5, of 48 hours evolution with PH gasometry of 7.31, PCO_2 of 44 mmHg PO_2 of 50 mmHg HCO_3 of 12mmol/L, saturation of 70%. Patient relatives do not accept invasive mechanical ventilation and the patient's neurological status did not allow non-invasive mechanical ventilation. There is no equipment for high-flow oxygen therapy and hypercapnia would not allow its use.

The possibility of using an airway catheterization using a 7 Fr. central venous access catheter is proposed to relatives. With a flow calculated by the distal lumen (16GA) it is 90 ml/min as an alternative mediated to increase oxygen saturation. Family authorizes the procedure, signed the consent under information.

Tropicalization of the upper airway mucosa is performed with 10% lidocaine in espay, and under precision videolaringoscopy, the wire guide is placed through the glottis without any complications, catheter placement is performed 7 Fr (approximately equivalent to a 2.5 mm endotracheal tube), (Figures 1–3) placing the catheter connectors at the level of the right labial commission, the placement of the catheter position is verified by videolarigoscopy, (Figures 4 and 5) it is connected to a source of oxygen at 15 liters per minute, the catheter is fixed and the oxygen saturation is recorded (Figure 6), after 10 minutes of placement of the catheter a saturation measurement is obtained obtaining a saturation of 88-90%, Figure 7 a gasometry is obtained at 30 min with pH of 7.33. PCO_2 of 38 mmHg, PO_2 of 61 mmHg HCO_3 of 13 mmol/L, saturation at 88%, without any complications. Patient enters the internal medicine service.

Case presentation 2

82-year-old male patient who has a history of Alzheimer's disease, type 2 diabetes mellitus, pulmonary fibrosis, metastatic prostate cancer outside of oncological treatment, after surgery for intestinal occlusion, is admitted due to septic shock of abdominal origin, remains under infusion of norepinephrine with tensile figures of 85/65 PAM of 71.3 heart rate of 115 b/m (beat/minute), oxygen saturation of 68% with a simple mask, has gasometry with a PH of 7.27, PCO_2 of 21 mmHg, PO_2 of 50 mmHg HCO_3 10 mmol/L. BE –17 mmol/L

65% saturation, of patient relatives do not accept invasive mechanical ventilation, or pulmonary brain cardio resuscitation maneuvers and high flow oxygen therapy equipment is not available.

Family members are asked about the possibility of airway catheterization, under local anesthesia, signed the consent under information.

Figure 1 Under local anesthesia of the oral mucosa with 10% lidocaine, precision videolaringoscopy is performed, obtaining an adequate visualization of the glottic ring.

Figure 2 The wire guide is placed with the curved tip, introducing it 10 cm below the vocal cords.

Figure 3 The catheter is placed under Seldinger technique through the vocal cords.

Figure 4 The wire guide is removed and the catheter is inserted until the junction of the connection ports is at the level of the right labial commissure. The position of the catheter in the vocal cords is verified.

Figure 5 Catheter fixation at the level of the right labial commissure, the length of the catheter is 20 cm. Approximately the tip of the catheter is 2 cm below the mouth cords in this case. It was connected via a 3-way key to an oxygen source s 15l / min.

Figure 6 The oxygen source is connected at 15 liters per minute through the catheter port using a 3-way key.

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Figure 7 Patient under oxygen therapy with simple oxygen mask and airway catheterization presented a sustained elevation 10 minutes after catheter placement, presenting oxygen saturation per monitor of 86-88% (baseline of 71%).

Topicalization of the mucosa of the airway with 10% lidocaine is performed, a pre-visualization with videolaringosopium is performed, finding a Cormark-Lehane -Cook (CLC) of I, the equipment is prepared with a catheter for central venous access bilumen Arrow 10 Fr equivalent to an endotracheal tube 3 mm, with an approximate flow of 130 ml/min. The visualization of the glottic ring is performed again, the wire guide is placed through the glottal opening 10 cm beyond the vocal cords, the catheter is placed under Seldinger's technique and the port is connected distal to a low flow oxygen source at 12ml/min. The catheter is attached to the right lip corner and the oxygen saturation is monitored. An oxygen saturation elevation is obtained at 7 minutes up to 86%, relatives are informed and the patient enters the internal medicine service.

Discussion

The use of a central venous access catheter for airway management was reported by Ziapour in 2016 (calling it as anterograde tracheal catheterization) in a case of subglottic stenosis which, under rapid induction sequence with midazolam and rocuronium, was impossible. Perform intubation and with the laryngeal mask presents leakage with positive pressure ventilation, and cricothyroidotomy was not an option due to the site of the stenosis, an increase in the oxygen situation from 60% to 80% was obtained, in the absence of alternatives to maintain optimal oxygen concentrations, enough time to take the patient to a tracheotomy.[1]

The use of a catheterization to administer supplemental oxygen directly at the infraglottic level, avoiding the turbulence of the nasal and pharyngeal structures, especially in terminal patients, may be an option due to the impossibility or lack of using devices or proven techniques for the administration of oxygen.[1,2]

In the case of Ziapor, airway catheterization was a "rescue" technique for an unforeseen subglottic stenosis, which worked to obtain the necessary time for tracheotomy.[1] In our cases, the central access catheter provided an additional flow, small, but direct and sufficient to raise oxygen saturation beyond 10% of the baseline with techniques such as the mask not recirculating with reservoir.[1]

No complications (gag reflex, bleeding, tachycardia etc) were observed during the procedure, and the patient tolerated the catheter properly).

Unlike the technique described by Ziapor, we use the curved tip of the catheter wire guide to reduce the risk of injury, perforation or dissection of the tracheal mucosa, and in the Ziapor technique scheme, it shows that the ports of the Bilumen catheter leaves them inserted at the level of the oral cavity and uses a 15/22 mm universal connector of an endotracheal tube to connect it to a positive pressure system.[3] In our cases, the fixation was done at the level of the labial commissure with the catheter ports outside the oral cavity and under supplemental oxygen without positive pressure.[1,4,5]

Conclusion

Antegrade airway catheterization is an "alternative" technique both for the administration of supplemental oxygen at an infraglottic level, or by positive pressure in situations such as severe, unintended or anticipated severe subglottic stenosis that leads to a need to maintain oxygenation conditions optimal either for emergency situations or scenarios such as those shown in the cases presented. Being an unorthodox technique, there is not enough evidence and the reported cases are minimal, more experience is needed on the effectiveness of the technique in the short term, however it is an alternative for multimodal airway management.

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None.

Conflicts of interest

None.

References

1. Ziapour B. Anterograde catheterization of severe tracheal stenosis as a difficult airway management option, followed by emergent tracheostomy (a case report). *J Cardiothorac Surg.* 2016;11(1):70.
2. Krnjevic K. Early effects of hypoxia on brain cell function. *Croat Med J.* 1999;40(3):375–380.
3. Rossi A, Khirani S. Intrinsic PEEP and the airbag effect. *Respiration.* 2009;77(3):256–258.
4. Krieger BP. Hyperinflation and intrinsic positive end-expiratory pressure: less room to breathe. *Respiration.*2009;77(3):344–350.
5. Laghi F, Goyal A. Auto-PEEP in respiratory failure. *Minerva Anestesiol.* 2012;78(2):201–221.