International Journal of Medical Science and Clinical Research Studies

ISSN(print): 2767-8326, ISSN(online): 2767-8342

Volume 04 Issue 02 February 2024

Page No: 334-340

DOI: https://doi.org/10.47191/ijmscrs/v4-i02-32, Impact Factor: 7.949

Difficult Airway in a Patient with Well-Differentiated Epidermoid Carcinoma: A Case Report

Víctor Rodrigo Islas-Canto*[1], Jacobo Elías Daguer-González[2], Alexis Emir Noguera-Echeverría[3], María Fernanda Ibarra-Guerrero[4], Francisco Rodolfo Esquivel-Díaz[5], Francisco Alejandro Nava-Rodríguez[6], Stephany Pilar Castellanos-Bernal[7], Karla Mariela Astorga-Avilez[8]

[1,5]Anesthesiology Resident. Clínica Hospital Mérida, ISSSTE. Facultad de Medicina de la Universidad Autónoma de Yucatán.

[2]Anesthesiologist, Clínica Hospital Mérida, ISSSTE. IMSS CMN Ignacio García Tellez.

[3]Surgical Resident. Clínica Hospital Mérida, ISSSTE. Facultad de Medicina de la Universidad Autónoma de Yucatán.

[4]MD. Universidad Anáhuac Mayab.

[6]Medical Student. Universidad Anáhuac Mayab.

[7,8]Anesthesiology Resident. Hospital Regional Valentín Gómez Farías, ISSSTE. Universidad de Guadalajara.

ABSTRACT

Introduction: Cutaneous epidermoid carcinoma (SCC) is a common skin tumor that can arise from precursor lesions or de novo. It is the second leading cause of death from skin cancer and its incidence is expected to double by 2030. Risk factors include gender, ionizing radiation, alcohol and tobacco use, and HPV infection. SCC can be classified into five types according to the Peniche classification, with the ulcerative form being the most frequent. Anesthesia management for head and neck cancers is challenging due to airway complications.

Case presentation: An 82-year-old female with a history of biomass combustion smoke exposure and hypertension presented with a painful papular lesion on the left nasal wing. Biopsy revealed well-differentiated epidermoid cancer. Despite treatment, the lesion progressed rapidly, leading to a request for surgical resection. The patient had predictors of difficult intubation and ventilation, and initial intubation attempts were unsuccessful. After aspiration of secretions and intracavitary bleeding, successful intubation was achieved on the second attempt. Controlled ventilation was initiated with specific settings.

Clinical discussion: A difficult airway can pose challenges for anesthesiologists, especially in patients with head and neck cancer. Pre-anesthetic evaluation and preparation for rescue devices or maneuvers are crucial. In this case, the patient had a difficult Intubation Prediction Index. General anesthesia allowed for invasive monitoring, venous access, and reliable mechanical ventilation. Direct laryngoscopy was performed due to retro nasal bleeding, with equipment available for difficult airway management and aspiration.

Conclusion: Anesthetic management for patients with head cancer presents challenges in airway management and carries the risk of complications. Pre-anesthetic and airway assessment are crucial to prevent complications and ensure successful intubation.

KEYWORDS: Cutaneous epidermoid carcinoma, Anesthesia, head and neck cancers, airway, intubation, General anesthesia, difficult intubation

ARTICLE DETAILS

Published On:
24 February 2024

Available on:
https://ijmscr.org/

INTRODUCTION

Cutaneous epidermoid carcinoma (SCC), formerly called squamous cell carcinoma, is described as the primary skin tumor that expresses a predominant scaling differentiation. It usually appears from precursor lesions, such as actinic keratosis or Bowen disease (carcinoma in situ). However, it may also appear on irradiated skin, over chronic inflammatory lesions, or de novo. [1]

The SCC is considered the second leading cause of death from skin cancer after melanoma, causing most of the deaths from skin cancer in adults older than 85 years. It is the most common skin cancer that forms within an existing scar. The number of cases has increased over the last three decades and is expected to double in European countries by 2030. [2]

The risk of SCC is highly dependent on gender, exposure to ionizing radiation, alcohol consumption, tobacco use, and infection with human papillomavirus (HPV) serotypes 16,18 and 31, as well as previous infections at the injury site. Preventing this type of cancer is remarkable because it can be avoided with proper education on using UV radiation protectors in most cases. [3]

There are multiple risk factors for SCC including white skin, male gender, exposure to ionizing radiation, alcohol, tobacco use, infection with human papillomavirus (HPV) serotypes 16,18 and 31, as well as previous infections at the injury site. It is important to mention the possibility of prevention since in most cases, this type of cancer would be avoidable with proper education on the use of UV radiation protectors. [3]

According to the *Peniche classification*, the SCC can be classified into five types: ulcerative, nodular, keratotic, vegetative, and superficial nodular. [3]
The ulcerative form is the most frequent, presenting an irregular, infiltrated, and friable base lesion, growing faster and more infiltrative than a basal cell carcinoma. [3]

This type of cancer surgery represents the treatment of choice, with the *Mohs technique* being the technique of choice to achieve lower rates of recurrence and greater sensitivity for the detection of perineural invasion. On the other hand, radiation therapy has been useful in select cases with three main functions: curative intention, supplementation of surgery, and palliative treatment. [3,4]
Managing anesthesia for head and neck cancers is challenging and carries a higher risk of complications during the transanestetic period. Few diseases have a significant impact on airway management as is in the patient who will be subjected to surgery for head and neck cancer. These patients have a high prevalence of difficulty in ventilation, especially after anesthetic induction, therefore, it is important to be prepared for the need to establish surgical access, since this complication occurs up to 27 times more than in the general surgical population. [5, 6, 7]

This article intends to highlight the challenges faced by patients with head and neck cancer, including airway management, chemotherapy, and radiotherapy complications, and the comorbidities that are often present. Proper communication between the entire medical-surgical team is crucial for effective multi-disciplinary management. [3, 6, 8]

We will report on the case of an 82-year-old patient who had well-differentiated epidermoid carcinoma in the left nasal wing. The patient had to undergo surgery to remove the lesion and reconstruct it with skin flaps, during which balanced general anesthesia was used.

CLINICAL CASE

An 82-year-old female, with the anesthetic significant antecedent of biomass combustion smoke exposure over 30 years, systemic arterial hypertension of 1-year evolution in treatment with Losartan 50 mg/day, and surgical history of debridement of an ulcer in the left nasal wing due to epidermoid cancer in August 2022.

The patient began her condition in January 2022 with the appearance of a painful papular lesion on the left nasal wing. In August 2022, she was evaluated by the dermatology service, which performed a debridement and biopsy under local anesthesia and sedation, which reported well-differentiated epidermoid cancer. However, the lesion persisted and in January 2023 a new biopsy was performed establishing the same diagnosis.

Despite the pharmacological and topical treatment, a papulose lesion appeared and rapidly progressed into an ulcer [Image 1] Therefore, the dermatology department requested prompt surgical resection due to the rapid progression and recurrence of the disease.

Image 1. Ulcerative lesion on the dorsum and left nasal wing.

The patient underwent an evaluation by the anesthesiology service 24 hours and 30 minutes before their surgical procedure establishing: an interincisive distance of 2.5 cm, Mallampati III, thyromentonian distance, and sternonomentonian grade II, limitation for the flexo-extension of the neck, limited mandibular protrusion with a predictive index of difficult intubation of 13 points [Image 2]. In addition, predictors of difficult ventilation included BMI >30 kg/m2, age over 57 years, edentulous, and history of snoring. It was decided to start preoxygenation with a facial mask at 5 liters per minute.

Image 2. During the physical examination of the airway, we observed the grade of mouth opening and classified the patient as Mallampati Grade IV.

It was decided to use balanced general anesthesia, premedicating the patient with Midazolam 2 mg intravenously (IV). Continued preoxygenation with supplemental oxygen at 5 liters per minute through a facial mask, began narcosis with slow bolus fentanyl diluted to 3 mcg/kg, anesthetic induction with lidocaine and propofol at 1 mg/kg, using Rocuronium as a muscle relaxant at doses of 0.5 mg/kg, bolus and IV.

Latency of muscle relaxant was expected, and it was decided to perform direct laryngoscopy with Macintosh sheet number 3 in the first attempt, visualizing only the epiglottis without glottic orifice and establishing on the Cormack-Lehane scale a Grade III. Failed intubation was obtained at the first attempt, therefore it was decided to remove the orotracheal tube and perform a second laryngoscopy, presenting difficulty for ventilation with two hands by a single provider, requiring aspiration of secretions and intracavitary bleeding, as well as ventilation with four hands managing to maintain oxygen saturation greater than 90% and performing a second attempt at laryngoscopy, this time cannulating the trachea with an orotracheal tube 7.0, corroborating with capnography and auscultation of pulmonary regions its proper positioning, and applying pneumoplasty of 5 ml. Started ventilation controlled by volume: tidal volume: 400 ml (7ml/kg, ideal weight), respiratory rate: 14 breaths per minute, Inspiration: Expiration 1:2, PEEP 4 cmH2O, pMax 35 cmH20.

The surgical team included plastic and reconstructive surgery, maxillofacial surgery, and otolaryngology specialists who collaborated throughout the various stages of the tumor removal process reconstruction of the affected tissues, and closure of the flap [Image 3 and 4].

Image 3. Orointubated patient, previous coverage with surgical fields.

Corresponding Author: Víctor Rodrigo Islas-Canto

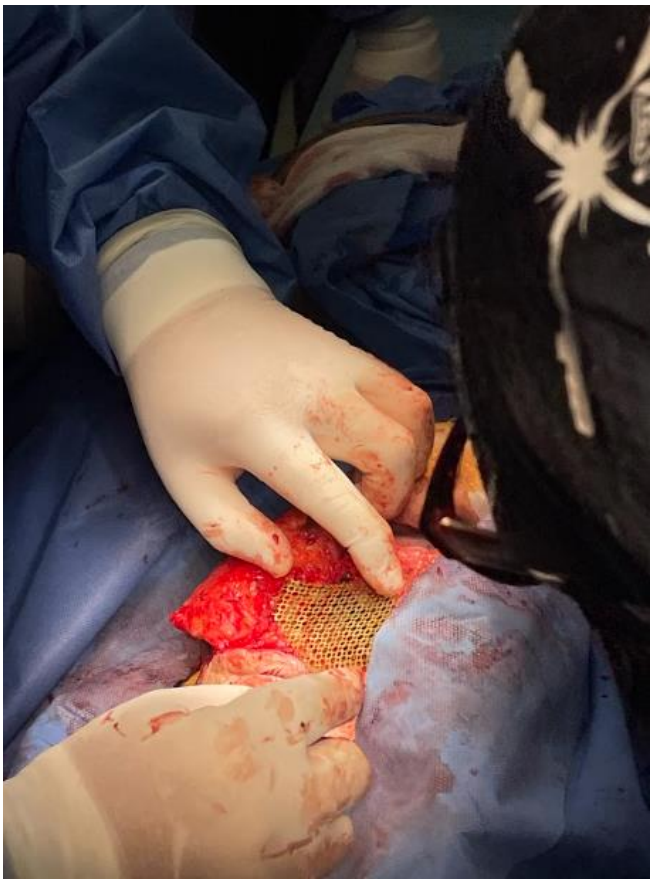

Image 4. Facial reconstruction with a prosthetic material graft.

During the transanesthetic period, vasopressor was required twice, administering a total of 20 mg of ephedrine, and using Sevoflurane at 2%, minimum alveolar concentration (MAC) 0.8 - 1, Fentanyl (300 mcg) IV and Dexmedetomidine (62 mcg) IV. Using as adjuvants to anesthetic management: Dexamethasone (8 mg) IV, Ketorolac (60 mg) IV, Ceftriaxone (1 g) IV, Ondansetron 8 (mg) IV, Metamizole (1 g) IV and Tramadol (100 mg) IV.

The surgical procedure was terminated and then extubation was performed in the surgical room without eventualities, emersion by pharmacological redistribution, presented protective reflexes of the airway with spontaneous ventilation [Image 5]. The patient was discharged from the operating room with continuous non-invasive monitoring in the postoperative care unit, hemodynamically stable and with 1/10 points in the Analog Visual Pain Scale plus a 9-point Aldrete, Andersen 1, Richmond 0, Riker 4, Ramsay 2; oxygen was administered by facial mask at 5 liters per minute and was kept under surveillance without anesthetic-surgical complications.

The patient was hospitalized for two additional days to administer analgesic and antibiotic management, as well as postoperative surveillance and discharge with medical follow-up by the surgical and dermatological team.

Image 5. Aspiration of blood and oral secretions before extubation.

DISCUSSION

A difficult airway is defined as a clinical situation in which difficulty or failure is experienced by a provider trained in anesthetic care, including mask ventilation, laryngoscopy, ventilation with supraglottic devices, tracheal intubation, or invasive airway. [8]

The anesthesiologist, being primarily responsible for airway management, should perform a complete pre-anesthetic evaluation, trying to determine the highest number of predictors of difficulty for intubation or ventilation in this group of patients with head and neck cancer. Additionally, the service must be ready to employ rescue devices or maneuvers when faced with such difficulties, as they are more common in patients undergoing surgery for head and neck cancer. [9]

It is important to mention that this group of patients should be considered with a difficult airway until proven otherwise, consequently, the anesthesiologist should have experience, and the tools to deal with any difficulties. [10]

In this case, the patient had a difficult Intubation Prediction Index of 13 points, equivalent to an intubation with frank difficulty that would probably require up to two intubation attempts and up to two additional maneuvers.

The Difficult Intubation Prediction Index tool is multi-variable, giving it a higher positive predictive value. This tool uses two of the most relevant predictors for difficult intubation in patients with head and neck cancer: sternonomentonian distance and

interincisive distance. In this case, the predictors of difficult intubation were: Mallampati Grade III, interincisive distance less than 2.5 cm, the limitation for the atlanto-occipital flexo-extension (Class III) and limitation of the mandibular protrusion, four of the five specific predictors for cataloging a difficult airway. This explains the difficulty of a successful intubation at the first attempt. [11, 12]

Given the estimated time of surgery, the bleeding into the airway, as well as the need for extensive resection and closure, the airway was ensured through orotracheal intubation; using general anesthesia to provide a state of unconsciousness throughout the surgical time, as well as adequate analgesia by the administration of fentanyl and dexmedetomidine, complemented with multimodal therapy. Similarly, general anesthesia has allowed the placement of invasive monitoring, as well as central or peripheral venous access with greater comfort for the patient and more reliable monitoring under mechanical ventilation. [9,10,13]

On the other hand, dexmedetomidine is a selective alpha-2 adrenergic receptor agonist that can be used as an adjuvant in the induction or maintenance of general anesthesia causing sedation, anxiolysis, reduced opioid use, reduced salivary secretion, and minimal respiratory depression. [14] In this case we decided to use dexmedetomidine in perfusion to reduce opioid consumption, as well as enhance the analgesic effect mediated by alpha-2 receptors, allowing us to extubate the patient at the end of the surgical event, having maintained a low plasma concentration of fentanyl.

Due to the particular conditions of this patient, presenting predictors of difficult ventilation such as age over 55 years, obesity, edentulous and obstructive sleep apnea, a MACOCHA score of 9 points (difficult airway prediction scale in critical patient), and the presence of exposure to biomass combustion smoke, of long evolution, it was decided to perform preoxygenation from the preoperative area until the time of laryngoscopy, as well as having more than two providers trained to provide effective ventilations, which allowed maintaining an oxygen saturation of more than 90%, until successful intubation, despite difficulties with mask ventilation. [10]

Current literature suggests approaching the difficult airway predicted with a video laryngoscope by indirect vision, with an algorithm proposed by the National Cancer Institute of Mexico. [15, 16]

However, in this case, we first approached the airway by direct laryngoscopy, since the patient had active retronasal bleeding, the latter being a relative contraindication for indirect viewing with a video laryngoscope. We also had equipment for difficult airway and devices for the rescue of the same in case of the scenario where it is not possible to ventilate or intubate the patient, in addition to having aspiration equipment for retro nasal bleeding.

In this case, it was necessary to give only vasopressor support intermittently with ephedrine, opting to ensure adequate perfusion of blood pressure and adequate management of intravenous fluids, to avoid complications with the flap that could cause the need for reintervention. [9, 13]

Ephedrine is a mixed-type vasopressor with dual action acting at the level of alpha1, Beta1, and Beta2 receptors (mixed effect), promoting the release of endogenous noradrenaline (dual action). The advantage of having used the Ephedrine in this patient was a rapid effect and short half-life, which allowed us to reach perfusion mean arterial pressures, while the fluid supply was adjusted, and can be administered in bolus IV. The main alternative vasopressors norepinephrine, epinephrine, and phenylephrine have an ultra-short half-life, requiring infusion for a continuous response; However, for this type of surgery in which it is of vital importance to ensure adequate perfusion towards the flap, it is recommended to avoid as much as possible the use of vasopressors continuously for risk of ischemia-flap necrosis. [17]

Head cancer presents specific challenges for anesthetic management in the airway, as well as the risk of complications during the transanestetic period. Few are the pathologies that present a change in medical action for the management and forecasting of the airway as is the patient who will be subjected to surgery for head cancer. However, the patient with head and neck cancer presents a high prevalence of difficulty in ventilation, especially after anesthetic induction, so it is very important to be prepared and have properly evaluated the airway before the possibility of a conventional or vigil intubation. [9,10]

Tracheal intubation either by conventional method or with an awake patient, is a technique that will ensure airway permeability, regardless of bleeding or surgical event, which in many cases is bloody. Tracheal intubation provides greater safety and reduces morbidity and mortality when performed safely under a thorough pre-anesthetic assessment. In the same way, this preliminary assessment allows us to identify the factors that could cause us difficult ventilation and be able to request additional equipment and personnel if necessary [13].

CONCLUSION

The patient with head and neck cancer represents a challenge from diagnosis to definitive management; a multidisciplinary evaluation is necessary for therapeutic decision-making, both in anesthetic and surgical management, intending to reduce the risks of morbidity and mortality in these patients. Proper pre-anesthetic and airway assessment prevents complications such as oxygen desaturation or failure of intubation attempts. There are still lines of research for the care of flaps and grafts, as well as the conditions and precautions that the surgical team must

optimize before submitting these patients to surgical intervention, However, in elective situations, the clinical status of the patient should be optimized to improve anesthetic, surgical and therapeutic success.

REFERENCES

I. Becquart, O., & Guillot, B. (2020). Carcinoma epidermoide cutáneo y sus precursores. *EMC - Dermatología*, *54*(1), 1–19. https://doi.org/10.1016/s1761-2896(20)43360-6

II. Cañueto, J., Tejera-Vaquerizo, A., Redondo, P., Botella-Estrada, R., Puig, S., & Sanmartin, O. (2020). Revisión de los términos que definen un carcinoma epidermoide cutáneo asociado a mal pronóstico. *Actas dermo-sifiliograficas*, *111*(4), 281–290. https://doi.org/10.1016/j.ad.2019.06.005

III. 3. Hernández Chacón, J. R., Torres Morales, S. A., & Hernández Chacón, E. M. (2021). Carcinoma Epidermoide Cutáneo, enfermedad de alta relevancia mundial. *Revista Medica Sinergia*, *6*(11), e731. https://doi.org/10.31434/rms.v6i11.731

IV. Pérez García, M. P., Mateu Puchades, A., & Sanmartín Jiménez, O. (2019). Perineural invasion in cutaneous squamous cell carcinoma. *Actas Dermo-Sifiliograficas*, *110*(6), 426–433. https://doi.org/10.1016/j.adengl.2019.05.007

V. Stelea, C., Patrascanu, E., Cureniuc, L., Hartie, L. V., Comanescu, M. P., Cracana, A., Ciofu, M. L., Costan, V.-V., & Boișteanu, O. (2020). Airway management in head and neck cancer surgery. *Romanian Journal of Oral Rehabilitation*, 139–143.

VI. Ferretiz López, G., Zepeda Barrios, K., Cuellar Guzmán, L. F., Zarazúa Juárez, M., Duran Zamora, K. A., Sandoval Larios, C. G., & Cano García, J. J. (2023). Consideraciones en la valoración de la vía aérea en el paciente con tumor de cabeza y cuello. *Revista chilena de anestesia*, *52*(1), 24–36. https://doi.org/10.25237/revchilanestv5201071320

VII. Jiménez-Orduz, A., Camelo-Pardo, G., Archila-Tibaduiza, L. J., Orozco-Castillo, M. C., & Benito-Cuadrado, L. F. (2022). La videolaringoscopia es una alternativa segura en el paciente despierto con vía aérea difícil anticipada. Reporte de Caso. Medunab, 25(3), 492–498. https://doi.org/10.29375/01237047.4107

VIII. Apfelbaum, J. L., Hagberg, C. A., Connis, R. T., Abdelmalak, B. B., Agarkar, M., Dutton, R. P., Fiadjoe, J. E., Greif, R., Klock, P. A., Jr, Mercier, D., Myatra, S. N., O'Sullivan, E. P., Rosenblatt, W. H., Sorbello, M., & Tung, A. (2022). 2022 American Society of Anesthesiologists Practice Guidelines for Management of the Difficult Airway. *Anesthesiology*, *136*(1), 31–81. https://doi.org/10.1097/aln.0000000000004002

IX. Goswami, U., & Jain, A. (2021). Anesthetic implications of free-flap microvascular surgery for head and neck malignancies – A relook. *Journal of Anaesthesiology, Clinical Pharmacology*, *37*(4), 499. https://doi.org/10.4103/joacp.joacp_22_20

X. Radi M, Makki H, et al (2021). Airway Management in Head and Neck Pathology. Special Considerations in Human Airway Management. IntechOpen; 2021. Available from: http://dx.doi.org/10.5772/intechopen.94498

XI. Domínguez-Pérez, M., & González-Dzib, R. D. S. (2023). Correlación entre el Índice predictivo de intubación difícil y el Cormack [Correlation between Predictive Index of Difficult Intubation and Cormack]. Revista médica del Instituto Mexicano del Seguro Social, 61(1), 15–20

XII. Mamatha, H., Kavitha, L., Sumitha, C., Rachana, N., Gowda, V., & Ranganath, N. (2021). Can inter incisor distance, sternomental distances predict the possibility of difficult intubation in patients posted for head and neck oncosurgeries: a prospective observational study. *European Journal of Molecular and Clinical Medicine*, *8*(4),1628.

XIII. McCauley, P., Moore, M., & Duggan, E. (2022). Anaesthesia for reconstructive free flap surgery for head and neck cancer. *British Journal of Hospital Medicine (London, England: 2005)*, *83*(5), 1–9. https://doi.org/10.12968/hmed.2021.0668

XIV. Mugabure Bujedo, B., González Santos, S., Uría Azpiazu, A., Conejero Morga, G., & González Jorrín, N. (2018). Coadyuvantes farmacológicos con efecto ahorrador de opioides en el periodo perioperatorio. *Revista de la Sociedad Española del Dolor*. https://doi.org/10.20986/resed.2018.3663/2018

XV. Ferretiz López, G., Zepeda Barrios, K., Cuellar Guzmán, L. F., Zarazúa Juárez, M., Duran Zamora, K. A., Sandoval Larios, C. G., & Cano García, J. J. (2023). Consideraciones en la valoración de la vía aérea en el paciente con tumor de cabeza y cuello. *Revista chilena de anestesia*, *52*(1), 24–36. https://doi.org/10.25237/revchilanestv5201071320

XVI. Jiménez-Orduz, A., Camelo-Pardo, G., Archila-Tibaduiza, L. J., Orozco-Castillo, M. C., & Benito-Cuadrado, L. F. (2022). La videolaringoscopia es una alternativa segura en el paciente despierto con vía aérea difícil anticipada. Reporte de Caso. *Medunab*, *25*(3), 492–498. https://doi.org/10.29375/01237047.4107

XVII. Albisua Aguilar, J. M., Ortega Vallado, F., Carrillo Torres, O., Lazo Gómez, R., & Pinto Segura, M. E. (2023). Efedrina versus norepinefrina para inestabilidad hemodinámica materna secundaria a bloqueo subaracnoideo en cesárea. *Acta Médica Grupo Ángeles*, *21*(2), 134–139. https://doi.org/10.35366/110259