

LETTER TO THE EDITOR

Open Access



Post-radiotherapy suggests a possible difficult airway even with an asymptomatic supraglottic change

Ayumi Oishi¹, Yukio Nomoto², Chiaki Nemoto^{3*} and Satoki Inoue⁴

Keywords: Airway management, Post-radiotherapy, Supraglottic change

Introduction

Airway changes due to radiotherapy, even after several years, take various forms. One of the difficulties we encounter is the airway management [1, 2]. Most of these cases involve laryngeal edema, fibrotic changes, and restriction of neck flexion. With these physical findings, we could expect a difficult airway (DA) before anesthesia induction. Here, we describe an asymptomatic, peculiar supraglottic change due to previous radiotherapy.

Case presentation

An 83-year-old woman (height = 155 cm; bodyweight = 55 kg) had undergone radiotherapy (66 Gy) for hypopharyngeal cancer 16 years previously. Cancer recurrence was found, and tumor resection using direct laryngoscopy was scheduled. Physical examination 1 day before surgery did not reveal findings that suggested a DA, only previous radiotherapy. Fibrotic changes in the neck, restriction of neck flexion, hoarseness, or difficulty in swallowing were not observed. The image of preoperative computerized tomography scan around the epiglottis did not indicate any abnormalities which we might suspect DA. However, preoperative flexible fiberoptic laryngoscopy showed a supraglottic change (Fig. 1a).

The airway was open, and we assessed the risk of difficulty in ventilation and intubation to be low. Anesthesia was

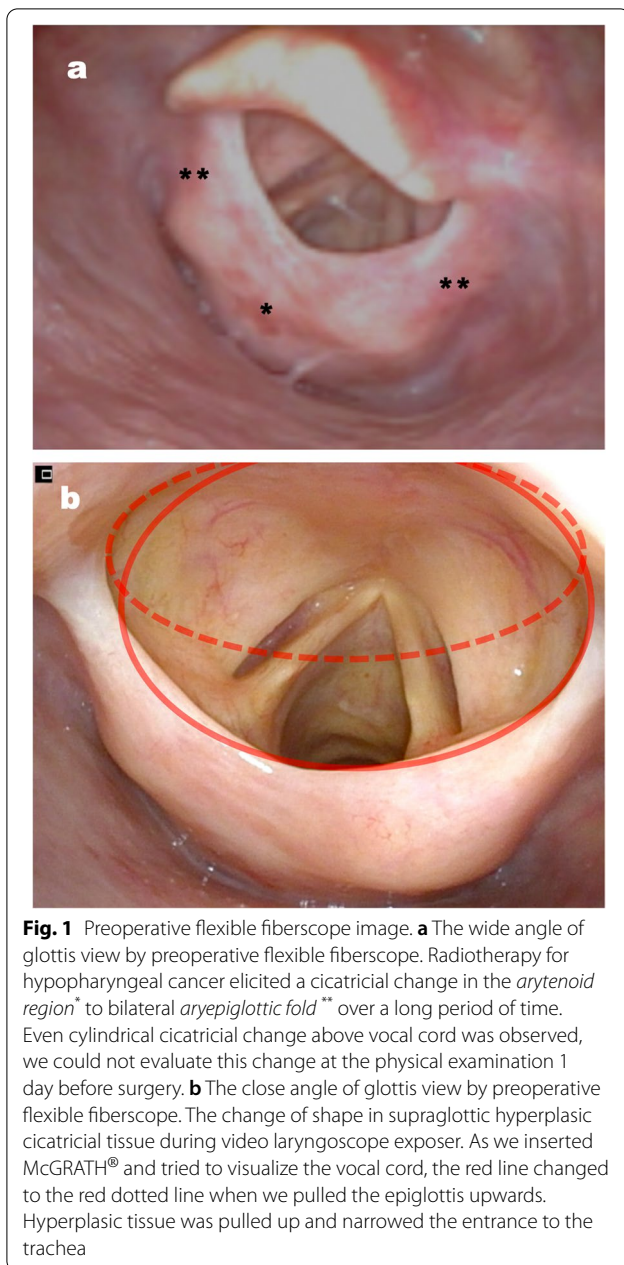
induced with propofol and remifentanyl, and then, rocuronium was administered. Mask ventilation did not pose problems. During intubation, to obtain a clear view of the vocal cords (VCs), the epiglottis was pulled upwards by a video laryngoscope (McGRATH[®]; Aircraft Medical, Edinburgh, UK). Supraglottic hyperplastic cicatricial tissue was also pulled up and interfered with the VC view, and a narrowed airway hampered intubation with an endotracheal tube (internal diameter (ID) = 6.0 mm) (Fig. 1b). We tried again without pulling up the epiglottis and then intubated with a micro-laryngeal endotracheal tube (ID = 5.0 mm; Covidien, Dublin, Ireland). Intubation was completed with second attempts of laryngeal exposure, and desaturation was not observed during intubation. The operation was trouble-free, and she was discharged from hospital on postoperative day 6.

Discussion

We did not find post-radiotherapy alterations (e.g., restriction of neck movement, fibrotic changes, voice change) upon physical examination 1 day before surgery. In most cases after radiotherapy, dysphagia due to supraglottic stenosis occurs [3, 4]. Before we undertook endoscopy, we did not expect a supraglottic change. One should consider encountering a DA in a patient who has undergone radiotherapy in the past. Preoperative endoscopy findings suggested there was sufficient space to pass an endotracheal tube through supraglottic hyperplastic tissue. However, laryngoscopy-based exposure of hyperplastic tissue in the VCs narrowed the entrance to the trachea. Thus, we tried again with less force to locate only the VCs, and intubation was undertaken with a bent, smaller tracheal tube with a stylet. Awake fiberoptic

*Correspondence: nemo@fmu.ac.jp

³ Department of Anesthesiology, Ohara General Hospital, 6-1 Ohomachi, Fukushima 960-8611, Japan
Full list of author information is available at the end of the article



intubation, which does not require laryngoscopy-based exposure, might allow intubation of tracheal tube to a pre-determined size. Whether we could have completed tracheal intubation by conventional laryngoscopy (which requires clearer exposure) in this patient is not known.

Conclusions

We described supraglottic hyperplastic changes after radiotherapy in an asymptomatic patient. The preoperative supraglottic view observed by a flexible fiberoptic endoscope may change when intubation using a laryngoscope is done.

Abbreviations

DA: Difficult airway; VCs: Vocal cords; ID: Internal diameter.

Acknowledgements

We thank Arshad Makhdum, PhD, from Edanz (<https://jp.edanz.com/ac>) for editing a draft of this manuscript.

Authors' contributions

AO carried out the intubation and wrote the manuscript. CN supervised the anesthetic management. CN reviewed and edited the manuscript. YN provided the otorhinolaryngologic information and helped in the manuscript writing. SI checked and provided advice regarding the manuscript. The authors read and approved the final manuscript.

Funding

Not applicable

Availability of data and materials

Not applicable.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Written informed consent was obtained from the patient.

Competing interests

The authors declare that they have no competing interests.

Author details

¹The Junior Resident Center, Ohara General Hospital, 6-1 Ohomachi, Fukushima 960-8611, Japan. ²Department of Otorhinolaryngology, Head and Neck, Ohara General Hospital, 6-1 Ohomachi, Fukushima 960-8611, Japan. ³Department of Anesthesiology, Ohara General Hospital, 6-1 Ohomachi, Fukushima 960-8611, Japan. ⁴Department of Anesthesiology, Fukushima Medical University, 1 Hikarigaoka, Fukushima, Fukushima 960-1295, Japan.

Received: 26 November 2022 Revised: 14 December 2022 Accepted: 21 December 2022

Published online: 29 December 2022

References

- Gupta B, Khan A, Ghosh D. Lung isolation for lobectomy in an elderly, post radiation fibrosis of a difficult airway-pediatric double lumen tube and pediatric ureteroscope as rescue devices. *Saudi J Anaesth*. 2020;14(2):281–3.
- Huitink JM, Zijp L. Laryngeal radiation fibrosis: a case of failed awake flexible fiberoptic intubation. *Case Rep Anesthesiol*. 2011;2011:878910.
- Stevens MS, Chang A, Simpson CB. Supraglottic stenosis: etiology and treatment of a rare condition. *Ann Otol Rhinol Laryngol*. 2013;122(3):205–9.
- Marciscano AE, Charu V, Starmer HM, et al. Evaluating post-radiotherapy laryngeal function with laryngeal videostroboscopy in early stage glottic cancer. *Front Oncol*. 2017;12(7):124.

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.