Lung isolation for lobectomy in an elderly, post radiation fibrosis of a difficult airway-pediatric double lumen tube and pediatric ureteroscope as rescue devices

Sir,

A 83-year-old male had complaints of persistent productive cough, progressive shortness of breath, asthenia, chronic weight loss, diagnosed case of squamous cell carcinoma of the upper lobe of left lung, was posted for left upper lung lobectomy after lung isolation. He was treated for carcinoma hypopharynx in 2007 with chemotherapy (cisplatin) and 35 cycles of radiotherapy to the neck region. He developed squamous cell carcinoma at the base of tongue in 2017 and underwent 25 cycles of radiotherapy. He was a chronic smoker with 40 pack years and tobacco chewer. Airway examination suggested a reduced mouth opening of 2.5 finger breadths, stone hard neck, restricted mobility at TM joint, marked limitation in neck extension; however, neck flexion was adequate. Due to previous history of irradiation to the neck region, indirect laryngoscopy was done by oto-rhino-laryngologists which showed bilaterally mobile vocal cords with fibrotic changes and reduced glottic chink. Patient was taken in OR, after attaching routine standard monitors, induction was done, and no difficulty was encountered in bag and mask ventilation. On direct laryngoscopy, due to restricted neck extension,
an anteriorly placed glottis with cormack lehane (CL) grade IVa was noted and there was no change in CL grade with external laryngeal manoeuvring. An adult bougie was passed with difficulty through the glottis and a 37 French DLET was railroaded over it, however, this DLET could not be negotiated past the glottis, due to reduced chink. The patient had an episode of desaturation during this manoeuvre and hence a 7 mm single lumen endotracheal tube was used to secure the airway by railroading it over the bougie. Trachea was extubated over bougie under direct laryngoscopy and a 32 French DLET was railroaded over it, but this also could not be negotiated past the glottis. After adequate ventilation to build up pulmonary O₂ reserves, intubation was attempted once again with a 28 French DLET under direct laryngoscopy and was successful. Proper placement was confirmed clinically by auscultation. As the diameter of both the adult and the paediatric bronchoscope is greater than the internal diameter of the tracheal and bronchial lumen of a 28 French DLET, confirmation of the position of the DLET could not be objectively done using fibreoptic bronchoscopy [Figure 1]. For this purpose, a 2.4 mm pediatric ureteroscope was used.

Our patient was elderly, with multitude of co-morbidities and adverse effects of previous history of neck irradiation resulted in a difficult airway. For intrathoracic procedures, lung isolation is a prerequisite; both to protect the healthy lung from contamination as well as for better surgical access. This poses several challenges during airway management; especially when the surgery requires use of a DLET. A DLET has larger external dimensions when compared to a standard single lumen tube of similar internal dimensions and will hence be difficult to negotiate past the glottis [Figure 1]. Radiotherapy lead to fibrosis of the soft tissues of the neck causing reduced neck extension, reduction in the aperture of the glottic chink and reduced mobility of the vocal cords, difficult intubation and the need for use of airway adjuncts such as bougies. Second, narrowing of the glottic chink required the use of DLET of smaller calibre than is recommended as per the height of the patient. As per the height of the patient, the recommended size of the DLET to be used was 39 French. We had to use a 28 French DLET in this patient, third, confirmation of correct placement of DLET could not be done using either an adult or a paediatric bronchoscope since their external diameters were larger than the internal diameter of the 28 French DLET, hence, we used a 2.4 mm paediatric ureteroscope. In this case, clinical anticipation, meticulous preoperative planning and preparation for management of a potentially difficult airway and preparedness for predicted complications aided in the smooth and successful placement of a definitive airway allowing for lung isolation as required intraoperatively.

Declaration of patient consent
The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Acknowledgment
We would like to acknowledge Dr. Pankaj Kumar Garg, onco-surgeon, and expert in thoracic onco- surgeries (and his team) for excellent surgical skills, meticulous approach and dedication towards patient’s care. We would also like to acknowledge Dr S P Agarwal, Onco surgeon for suggesting his pearls of wisdom.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

BHAVNA GUPTA, ATIF KHAN, DEYASHINEE GHOSH
Department of Anesthesiology, AIIMS, Rishikesh, Uttarakhand, India

Address for correspondence:
Dr. Bhavna Gupta,
AIIMS, Rishikesh, Uttarakhand, India.
E-mail: bhavna.kakkar@gmail.com
Letters to Editor

Submitted: 16-Jan-2020, Accepted: 16-Jan-2020,
Published: 05-Mar-2020

Dear Editor

We thank Kumar et al. for their insightful comments on our letter.[1,2] The authors give excellent points towards the reason for forming the unusual ring at the proximal end of the cuff.[2] We agree with the point that while pulling out the tube, the minimal residual air might have squeezed to that end, and when the cuff was deflated, it gave rise to the ring. However, in this regard, it is to be noted that the trachea is not an absolutely rigid structure, and the tracheal ring is deficient posteriorly. Hence, when there is minimal air in the cuff, with traction on the cuff, the air is unlikely to be distributed homogeneously and only in one direction. Nevertheless, when the two factors combine, i.e., pulling the tube leading to accumulation of air towards the proximal end, as suggested by the authors, and too much deflation of the cuff, as mentioned by us, could lead to the situation. Therefore, our point indicating that too much of deflation in a stuck tube can pose an additional problem cannot be summarily rejected.

The 180° rotation we mentioned in our letter is the rotation of the machine end of the tube, which was, of course, not specifically mentioned in our manuscript, and the author rightly indicates that a thermo-elastic polyvinyl chloride tube is unlikely to get a similar amount of rotation at the other end. However, a few points the authors mention regarding patient safety and hastiness need attention. First, the 7 mm ID tube was inserted in the second attempt, because the 7.5 mm ID tube was hard to negotiate in the first attempt, not impossible. Second, to be safer, we only inflated the cuff with an additional 1 ml (over and above the minimal residual volume in the deflated cuff), which is very minimal. The cuff pressure, measured as a part of routine practice in our institute, was found to be not high to cause excessive pressure and edema of the tracheal wall. Third, the 7 mm ID tube was well fit, and there was a leak around the cuff at the leak test, which is already mentioned. Fourth, fiberoptic videoscopic examination was done, which is also apparent from the figure, and it has been mentioned in the manuscript, and we could find no abnormality. The blood tinge only at one point of the nearly hexagonal ring was possibly due to minor injury while the tube was tried to rotate and pull simultaneously. Too much of deflation of the cuff also made this ring sharp and more capable of causing injury. We agree with the author that such a typical ring is not usual in low-pressure high volume cuff, and multiple factors might have worked to have so.

There is no doubt that the authors comment enlightened us and will do so for the readers too. However, our case does indicate that we should be cautious in over-enthusiastic deflation of the cuff in a difficult to extubate case.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

Reference
1. Gupta B, Gupta L. Significance of the outer diameter of an endotracheal tube: A lesser-known parameter. Korean J Anesthesiol 2019;72:72-3.

How to cite this article: 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;14:281-3.