


done only after the removal of the headholder pins. Concurrently, the authors desire to emphasize that this unfortunate anesthetic complication is entirely preventable, and all efforts must be made to avert patient harm.

Conflicts of interest

The authors declare no conflicts of interest.

References

1. Gardner WJ. Intracranial Operations in the Sitting Position. *Ann Surg.* 1935;101:138–45.
2. Baerts WD, de Lange JJ, Booij LH, Broere G. Complications of the Mayfield skull clamp. *Anesthesiology.* 1984;61:460–1.

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Subjective method for tracheal tube cuff inflation: time to bid adieu



Dear Editor,

We read with interest the study by Duarte et al., titled “Subjective method for tracheal tube cuff inflation: performance of anesthesiology residents and staff anesthesiologists. Prospective observational study”.¹ We laud the authors for choosing such a relevant and timeless topic. The dangers of over-inflating the endotracheal tube cuff are well known, including, but not limited to, sore throat, hoarseness, dysphagia, and under extreme circumstances, vascular occlusion and tracheal ischemia.^{1,2} The authors raise an extremely valid point, that when non-standardized methods, such as pilot balloon palpation are used, even the experienced anesthesiologists may not be able to guard the patients from the hazards of tracheal ischemia.

However, the study design documented by the authors requires some more elucidation. It would be desirable to know how anesthesia was maintained for the cases in question. Nitrous oxide is known to diffuse into the cuff and eventually increase cuff pressures and thus lead to increased morbidity due to increased cuff pressures. This diffusion occurs slowly over time, with Mogal et al., finding a significant increase in cuff pressures, in comparison to the previous readings, at both 30 and 60 minutes after intubation.³

This brings us to the next aspect of the study design that leaves room for improvement. When Mogal et al. compared cuff pressures with use of air and nitrous oxide, they found that while the increase in cuff pressures was significantly higher in the nitrous oxide group, the group with air also showed serial rise in pressures, albeit not as high.³ Duarte et al. have measured the cuff pressures only at one point in the surgery. However, the time-point is not specific. It is said

to have been “up to 60 minutes after tracheal intubation”.¹ This variability in the time of measurement could have led to readings that may not reflect the true pressures, just after cuff-inflation.

It might also be pertinent to know whether all the patients that participated in the study underwent the same type of surgery and if laparoscopic approaches were employed for any of them. In comparison to pressures seen in open surgical procedures, significantly higher cuff pressures have been found in patients undergoing laparoscopic procedures, and that too, as early as 5 minutes after institution of pneumoperitoneum.⁴

The authors work in government-aided teaching hospitals, that cater to the economically challenged patients, in a developing country. We understand not only the scarcity of cuff-pressure manometers, but also the difficulties maintaining such equipment in our set-up. However, we believe inexpensive alternatives to manometers do exist and recommend the use these alternatives to ensure appropriate cuff pressures.

The authors particularly endorse the use of Pressure Volume Loops (PVL), a real time graphic available on the anesthesia machines and ventilators, which is an easy, safe and effective method of ensuring appropriate cuff pressures after inflation. The method involves inflating the cuff in gradual increments of 0.5 mL, till a complete closure of the PVL can be seen, i.e., the expiratory limb reaches zero volume and meets the starting point of the inspiratory limb. Almarakbi et al. found that significantly lower volumes of air were required to achieve a seal and that recorded intra-cuff pressures were also well within normal limits.⁵

With the availability of newer tools to help achieve and maintain appropriate cuff pressures, which provide for enhanced safety for the patients, it only seems fair to bid adieu to the age-old technique of subjective method for tracheal tube cuff inflation by palpating the pilot balloon.

Conflicts of interest

The authors declare no conflicts of interest.

References

1. Duarte N, Caetano A, Arouca G, et al. Insuflação de balonete de tubo traqueal por método subjetivo: desempenho de médicos residentes e especialistas em anesthesiologia. Estudo prospectivo observacional. *Rev Bras Anesthesiol.* 2020;70:9–14.
2. Al-metwalli R, Mowafi H, Abdulshafi M, et al. Is sealing cuff pressure, easy, reliable and safe technique for endotracheal tube cuff inflation?: a comparative study. *Saudi J Anaesth.* 2011;5:185.
3. Mogal S, Baliarsing L, Dias R, et al. Comparação de alterações na pressão do balonete do tubo endotraqueal usando ar versus óxido nítrico nos gases anestésicos durante cirurgias abdominais laparoscópicas. *Rev Bras Anesthesiol.* 2018;68:369–74.
4. Yıldırım Z, Uzunkoy A, Cıgdem A, et al. Changes in cuff pressure of endotracheal tube during laparoscopic and open abdominal surgery. *Surg Endosc.* 2011;26:398–401.
5. Kaki A, Almarakbi W. Tracheal tube cuff inflation guided by pressure volume loop closure associated with lower postoperative cuff-related complications: prospective, randomized clinical trial. *Saudi J Anaesth.* 2014;8:328.

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