

Content available at: <https://www.ipinnovative.com/open-access-journals>

Indian Journal of Clinical Anaesthesia

Journal homepage: www.ijca.in

Letter to Editor

Perioperative venous air embolism during transurethral resection of prostate

Anuradha Dialani¹, Lalit Gupta^{2*}, Ankur Sharma²¹Dept. of Anaesthesia and Critical Care, Lok Nayak Hospital, New Delhi, India²Dept. of Anaesthesia, Maulana Azad Medical College and Associated Hospital, New Delhi, India

ARTICLE INFO

Article history:

Received 03-07-2024

Accepted 10-07-2024

Available online 30-08-2024

This is an Open Access (OA) journal, and articles are distributed under the terms of the [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License](https://creativecommons.org/licenses/by-nc-sa/4.0/), which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprint@ipinnovative.com

Dear Editor,

Understanding the various complications associated with transurethral resection of the prostate (TURP) is crucial for both urologists and anesthesiologists. Although rare, venous air embolism (VAE) during TURP is a serious and potentially fatal complication.¹ We wish to share a case of an 87-year-old male who experienced VAE due to the use of an Ellik's evacuator during TURP.

An 87-year-old male with a 20-year history of hypertension well managed with telmisartan shifted to our Intensive care unit post-cardiac arrest resuscitation for further management. The patient had undergone TURP under spinal anesthesia. The procedure had been uneventful until the insertion of a three-way Foley catheter. At this point, the patient experienced sudden chest discomfort followed by bradycardia and asystole. Immediate resuscitative measures, including advanced cardiac life support, were initiated, and cardiac activity was successfully restored.

Post-resuscitation, the patient exhibited a right ventricular strain pattern on electrocardiography suggestive of VAE. Further evaluation and a detailed chronology revealed that the surgeon had used an Ellik's evacuator, which likely caused the air embolism. Despite the initial critical condition, the patient improved and was discharged on the fourth day.

* Corresponding author.

E-mail address: lalit.doc@gmail.com (L. Gupta).

1. Discussion

VAE during TURP is extremely uncommon, with only a few cases reported. The condition can occur if the surgical field is above the heart, allowing air to be passively drawn into an open, non-collapsible vein by the negative intrathoracic venous pressure.² One of the main causes of air infusion include incorrect assembly of the bladder irrigation-resectoscope-drainage system, causing gas to flow into the bladder due to reverse connection of the inflow and outflow lines.^{1,3} Other common causes include infusion of gas into the irrigation fluid used to rinse the bladder at the end of the procedure (Ellik's evacuator or three-way Foley catheter, Figure 1),^{4,5} infusion of gas into the irrigation bag for generating pressure for irrigation fluid, inclusion of gas when the internal cylinder is inserted and removed, and gas generation by an electrosurgical knife.⁶ In addition to passive movement of air into an open venous system, active VAE can occur when air is forced into an open venous channel.^{5,7} Use of the Ellik's evacuator to rinse the bladder or irrigation of a three-way Foley catheter with an air/fluid-filled syringe can introduce air under pressure into the open venous sinuses of the prostate.^{4,5,8}

In our case, the use of an Ellik's evacuator created positive pressure, and an unknown quantity of air was pushed into the venous bed of the prostate, leading to VAE. The factors that influence morbidity and mortality of VAE include the rate of entrainment, volume of air entrained,



Figure 1: Showing Ellik's evacuator: **A)** assembly, **B)** parts and **C)** in use

position of the patient during the event, and the cardiac status of the patient.⁹ The lethal volume of IV air in humans is estimated to be between 200 and 300 mL.¹⁰

Awareness of the possibility of VAE during TURP, although rare, is essential for both urologists and anesthesiologists. Prompt recognition and resuscitation are vital to patient survival. Key indicators include sudden hypotension, bradycardia, and chest discomfort. Anesthesiologists should be vigilant for these signs and coordinate closely with surgeons to manage the situation. This case emphasizes the importance of a collaborative approach to perioperative care to ensure patient safety and minimize adverse outcomes.

References

1. Frasco PE, Caswell RE, Novocki D. Venous air embolism during transurethral resection of the prostate. *Anesth Analg.* 2004;99(6):1864–6.
2. Gordy S, Rowell S. Vascular air embolism. *Int J Crit Illn Inj Sci.* 2013;3(1):73–6.

3. Matsuno D, Cho S, Isshiki S, Kojima S, Sato N, Suzuki F, et al. A case of venous air embolism during transurethral resection of the prostate. *Hinyokika Kyo.* 2007;53(6):409–11.
4. Hofsess DW. Fatal air embolism during transurethral resection. *J Urol.* 1984;131(2):355.
5. Vacanti CA, Lodhia KL. Fatal massive air embolism during transurethral resection of the prostate. *Anesthesiology.* 1991;74(1):186–7.
6. Tsou MY, Teng YH, Chow LH, Ho CM, Tsai SK. Fatal gas embolism during transurethral incision of the bladder neck under spinal anesthesia. *Anesth Analg.* 2003;97(6):1833–4.
7. Nowitz A, Artru AA. Air embolism during radical cystectomy with ileal conduit urinary diversion. *Anesthesiology.* 2002;96:506–8.
8. Fukano N, Sasaki J, Iida R, Ichihara Y, Suzuki T, Ogawa S. Pulmonary embolism induced by evacuator during transurethral resection of the prostate. *Masui.* 2007;56(2):178–80.
9. Shaikh N, Ummunisa F. Acute management of vascular air embolism. *J Emerg Trauma Shock.* 2009;2(3):180–5.
10. Mccarthy CJ, Behraves S, Naidu SG, Oklu R. Air Embolism: Diagnosis, Clinical Management and Outcomes. *Diagnostics (Basel).* 2017;7(1):5.

Author biography

Anuradha Dialani, Resident

Lalit Gupta, Professor  <https://orcid.org/0000-0001-7291-5961>

Ankur Sharma, Resident

Cite this article: Dialani A, Gupta L, Sharma A. Perioperative venous air embolism during transurethral resection of prostate. *Indian J Clin Anaesth* 2024;11(3):440-441.