



Re: Recovery and safety with prolonged high-frequency jet ventilation for catheter ablation of atrial fibrillation: A hospital registry study from a New England healthcare network

To the Editor,

We read with great interest the article by Ricardo Munoz-Acuna et al. [1], which retrospectively compared conventional ventilation with high frequency jet ventilation (HFJV) during catheter ablation of atrial fibrillation (CAAF). The authors identified an increased duration of recovery in the post-anesthesia care unit (PACU) and increased incidences of arterial hypotension and arterial hypocarbia in the HFJV arm. However, we believe that these results must be interpreted with great caution.

Firstly, the two ventilation groups differed in the mode of anesthesia used to maintain hypnosis during the procedure. In the HFJV group, anesthesia was maintained by continuous infusion of propofol and, in many cases, remifentanyl. In contrast, in the conventional ventilation group, anesthesia was maintained for the majority of patients by inhalation of halogenated gases. Furthermore, the authors did not provide details regarding the method used to titrate hypnotics. This represents a major bias in the assessment of the outcomes chosen by the authors, as we will discuss below.

The mean total procedure duration of CAAF, either under conventional ventilation and HFJV was prolonged, with durations of 282 minutes and 307 minutes, respectively. Published data [2] suggest that in high-volume centers, similar procedures can be completed within two to three hours, which aligns with our institutional experience. In patients classified as obese or overweight, the extended operative time may result in propofol accumulation, which could explain the delayed recovery from anesthesia, consistently with the drug's pharmacokinetic profile. In procedures of shorter duration conducted under HFJV, with total intravenous anesthesia maintained via propofol and remifentanyl, no significant difference in the length of stay in the PACU has been observed [3].

Furthermore, the potential absence of depth of anesthesia monitoring may have resulted in oversedation of patients under propofol anesthesia, particularly given the high prevalence of remifentanyl use in the HFJV arm. This may also have contributed to the delayed recovery [4] and arterial hypotension observed in the HFJV arm.

Secondly, we lack crucial information regarding ventilation parameters used during HFJV (respiratory frequency, working pressures), whereas inappropriate use of this method could also influence the outcomes chosen by the authors.

On the one hand, an excessive respiratory frequency can result in an elevation of intrinsic positive end-expiratory pressure (PEEP) at a given working pressure [5]. This rise in intrathoracic pressure could significantly decrease left heart preload, especially in patients with atrial fibrillation, who depend on adequate preload for maintaining cardiac output. In contrast, the increased risk of hypotension observed in the HFJV group, without a corresponding rise in the incidence of

vasopressor use, represents an unexpected finding. This discrepancy may be linked to the routine administration of vasopressors during the procedures (96.2% vs. 97.3%), a rate that deviates from our current practice and may indicate excessive anesthetic depth, frequent use of remifentanyl, and increased intrathoracic pressure due to inadequate HFJV use.

On the other hand, as discussed by Muñoz-Acuna and colleagues [1], the use of elevated working pressures may be a key factor in the observed hypocarbia under HFJV. This view is consistent with evidence that driving pressure, rather than respiratory rate, plays a pivotal role in CO₂ removal during HFJV. It is somewhat unexpected that this hypocapnia was not addressed during the procedure, particularly given that an average of four arterial blood gas measurements were taken during each HFJV.

In conclusion, the findings of this study are seriously biased by the mode of anesthesia maintenance differing between the two groups, and the lack on data regarding anesthesia depth monitoring and HFJV parameters used do not permit definitive conclusions to be drawn about the impact of ventilatory mode during CAAF. However, they emphasize the importance of meticulous monitoring of anesthetic depth during total intravenous administration of propofol and remifentanyl to avoid arterial hypotension and prolonged anesthesia recovery. Moreover, the findings emphasize the necessity of close CO₂ monitoring during HFJV, either through repeated arterial blood gas sampling or continuous transcutaneous monitoring, while correspondingly adjusting working pressures. A prospective study on this topic would be beneficial for evaluating the two types of ventilation independently in a well-controlled manner, irrespective of the anesthesia plan.

CRedit authorship contribution statement

Adrien Maseri: Writing – original draft. **Quentin Delhez:** Writing – review & editing. **Michael Hardy:** Writing – review & editing.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author(s) used DeepL Write® in order to enhance the quality of the English translation. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the published article.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence

the work reported in this paper.

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