



Post-thyroidectomy prothrombin time elevation and hematoma in a patient who received sugammadex

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Received: 11 March 2021 / Revised: 22 March 2021 / Accepted: 24 March 2021 / Published online: 13 April 2021
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To the Editor,

Post-thyroidectomy hematoma (PTH) can be a life-threatening event. Predictors for this complication have been the subject of previous studies but have not included the use of sugammadex.^{1,2} This letter describes a case of PTH and prothrombin time (PT) elevation in a patient who received sugammadex, raising the possibility that the latter might be a new risk factor to consider.

A 48-yr-old healthy woman who consented to this report underwent hemithyroidectomy for nodular goiter. On preanesthetic assessment, her coagulation profile was normal (Table). Anesthesia was induced with fentanyl, propofol, and rocuronium, and was maintained with sevoflurane and rocuronium. The surgery was uneventful. A drain was left in the thyroid bed. The patient received acetaminophen and nefopam for postoperative analgesia. Prior to extubation, she was given 320 mg of sugammadex to reverse moderate residual neuromuscular blockade (train-of-four response, one twitch; post-tetanic count, 2). Blood pressure (BP) was tightly controlled during the intervention.

Forty-five minutes later, the patient reported neck pain and difficulty breathing. The oxygen saturation dropped to 91%; her BP was 140/75 mmHg and her heart rate 104 min⁻¹. The surgical wound assessment and presence of blood within the drain were highly suggestive of PTH. The surgeon quickly opened the incision. The bleeding did not stop, and the patient was brought back to the theatre. The

patient was reintubated without difficulties. The exploration to find the source of bleeding revealed a general ooze and no bleeding from an identified vessel. The surgeon performed a manual compression, which helped control the bleeding. The patient received tranexamic acid. A drain was replaced and the patient was transferred to the intensive care unit (ICU) for delayed extubation. A coagulation profile showed elevation of the PT and international normalized ratio (INR), as well as to a lesser extent of the activated partial thromboplastin time (aPTT; Table).

During eight hours of close monitoring, there were no signs of bleeding recurrence. A repeat coagulation profile was normal (Table). The sedation subsequently was stopped and the patient was extubated without requiring reversal agents. She remained eupneic and left the ICU the next day. She was discharged from the hospital on day 3. Two weeks later, a comprehensive assessment of the coagulation profile was normal.

Over the last decade, concerns have been raised about coagulation disturbances by sugammadex but definitive conclusions are not yet available. While some authors have asserted that sugammadex exerts a transient and limited effect on coagulation that is not associated with an increased risk of bleeding,^{3,4} others have advocated that physicians should be cautious with higher sugammadex doses, particularly in patients with a high risk of bleeding.⁵

The definition of bleeding risk and its clinical relevance cannot be the same for all surgical procedures. In thyroid surgery, a small amount of postoperative bleeding could be fatal because of major airway compromise. Nevertheless, no clinical studies have been performed in patients undergoing thyroidectomy to assess the effects of sugammadex on the risk of PTH. The present patient did not have any reported risk factors of PTH.^{1,2} After

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TABLE Coagulation profile at various times during the perioperative course

Time	PT, sec (mean normal, 12)	INR	aPTT, sec (normal range, 30–40)	Platelet count, cells·mm ⁻³
Preoperative	10	0.8	38	225,000
H0	17	1.5	44	270,000
H8	11	0.9	39	235,000

aPTT = activated partial thromboplastin time; H0 = postoperative hour 0; H8 = postoperative hour 8; INR = international normalized ratio; PT = prothrombin time.

receiving sugammadex, she developed transient elevations in PT/INR and aPTT. Our intraoperative management including temperature control, drugs, and fluids did not indicate an untoward effect on coagulation profile and blood loss. Therefore, we would suggest that the observed elevations of PT/INR and aPTT, and the associated PTH, were likely caused by sugammadex.

This case raises a new concern in the field of thyroid surgery, and further investigations are warranted. Until more robust data are available, we would suggest that anesthesiologists should be vigilant when using sugammadex during thyroidectomy, especially among patients with other risk factors of bleeding.

Disclosures None.

Funding statement None.

Editorial responsibility This submission was handled by Dr. Stephan K.W. Schwarz, Editor-in-Chief, *Canadian Journal of Anesthesia/Journal canadien d'anesthésie*.

References

1. Liu J, Sun W, Dong W, et al. Risk factors for post-thyroidectomy haemorrhage: a meta-analysis. *Eur J Endocrinol* 2017; 176: 591-602.
2. Fan C, Zhou X, Su G, et al. Risk factors for neck hematoma requiring surgical re-intervention after thyroidectomy: a systematic review and meta-analysis. *BMC Surg* 2019; DOI: <https://doi.org/10.1186/s12893-019-0559-8>.
3. Rahe-Meyer N, Fennema H, Schulman S, et al. Effect of reversal of neuromuscular blockade with sugammadex versus usual care on bleeding risk in a randomized study of surgical patients. *Anesthesiology* 2014; 121: 969-77.
4. Carron M, Bertini D, Prandini T, et al. Effect of sugammadex on coagulation as detected by rotational thromboelastometry in morbidly obese patients. *Minerva Anestesiol* 2018; 84: 178-88.
5. Kang WS, Lim H, Kim BS, Lee Y, Hahn KD, Kim SH. Assessment of the effects of sugammadex on coagulation profiles using thromboelastographic parameters. *Sci Rep* 2020; DOI: <https://doi.org/10.1038/s41598-020-68164-2>.

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