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Case Report

When day seven strikes: a cautionary tale of direct oral anticoagulation resumption following thyroidectomy

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ABSTRACT

Delayed neck haematoma following thyroidectomy is an uncommon but potentially life-threatening complication due to the risk of rapid airway compromise. We report a 62-year-old man with non-valvular atrial fibrillation on rivaroxaban who developed a large anterior neck haematoma on postoperative day (POD) 7, three days after resumption of anticoagulation following an initially uncomplicated total thyroidectomy with lateral neck dissection. Emergency re-exploration revealed active bleeding from a small superficial vessel between the sternocleidomastoid and platysma. The patient recovered without further complications after evacuation, haemostatic adjuncts and delayed reintroduction of anticoagulation. This case highlights the potential for clinically significant delayed haemorrhage after thyroidectomy in the context of direct oral anticoagulation (DOAC) therapy. It also emphasises the importance of vigilant post-discharge counselling regarding late warning signs and supports individualised perioperative anticoagulation strategies in head and neck surgery.

Keywords: Thyroidectomy, Post-thyroidectomy haemorrhage, Delayed neck haematoma, Head and neck surgery, Endocrine surgery, Anticoagulation, Direct oral anticoagulation, Novel oral anticoagulation

INTRODUCTION

Delayed neck haematoma after thyroidectomy is a rare but serious complication due to the potential for rapid airway compromise and asphyxiation.[1,2] When it occurs, post-thyroidectomy haemorrhage typically develops within the first 24 hours. The increasing use of direct oral anticoagulants (DOACs) such as rivaroxaban, apixaban and dabigatran has introduced new perioperative management challenges. DOACs exert their anticoagulant effect through direct, selective and reversible inhibition of thrombin (dabigatran) or factor Xa (rivaroxaban, apixaban).[3] DOACs offer predictable pharmacokinetics with rapid onset (peak effect in 1-4 hours) and short half-lives (5-17 hours depending on the agent and renal function), reducing the need for routine monitoring.[3] While specific reversal agents exist (idarucizumab for dabigatran, andexanet alfa for rivaroxaban and apixaban), they are not widely available.[3] Emergency management commonly relies on non-specific reversal agents such as four-factor prothrombin complex concentrate (4F-PCC) and tranexamic acid.[4]

DOACs offer advantages over warfarin in terms of predictability and reduced monitoring requirements. However, their perioperative resumption following head and neck surgery remains limited, with current recommendations largely extrapolated from non-cervical surgical populations. This case report illustrates the challenges of balancing thromboembolic and haemorrhagic risks when resuming DOAC following thyroidectomy.

CASE REPORT

A 62-year-old man with non-valvular atrial fibrillation on rivaroxaban underwent elective total thyroidectomy and right lateral neck dissection for thyroid cancer. Rivaroxaban was withheld 48 hours preoperatively in the context normal renal and hepatic function and consultation with cardiologists, in accordance with institutional perioperative anticoagulation guidelines. The surgery was uncomplicated and his initial postoperative recovery was uneventful with drain removal the next day. He was discharged on postoperative day (POD) 3 without swelling and planned to recommence rivaroxaban on POD 4. Following recommencement, minor haemoserous ooze was noted around surgical site, which spontaneously resolved over two days.

On POD 7, three days after resuming rivaroxaban, he presented to the emergency department with sudden onset anterior neck swelling. He denied dyspnoea or dysphagia but reported a mildly lowered voice compared with baseline. On arrival, he was haemodynamically stable without clinical evidence of airway compromise. He received 1g of intravenous tranexamic acid and 4F-PCC (Beriplex® AU). Urgent CT angiography demonstrated a 105mm right anterior neck haematoma with a 28×18 mm fluid-filled level suggestive of recent or ongoing bleeding (Figure 1).

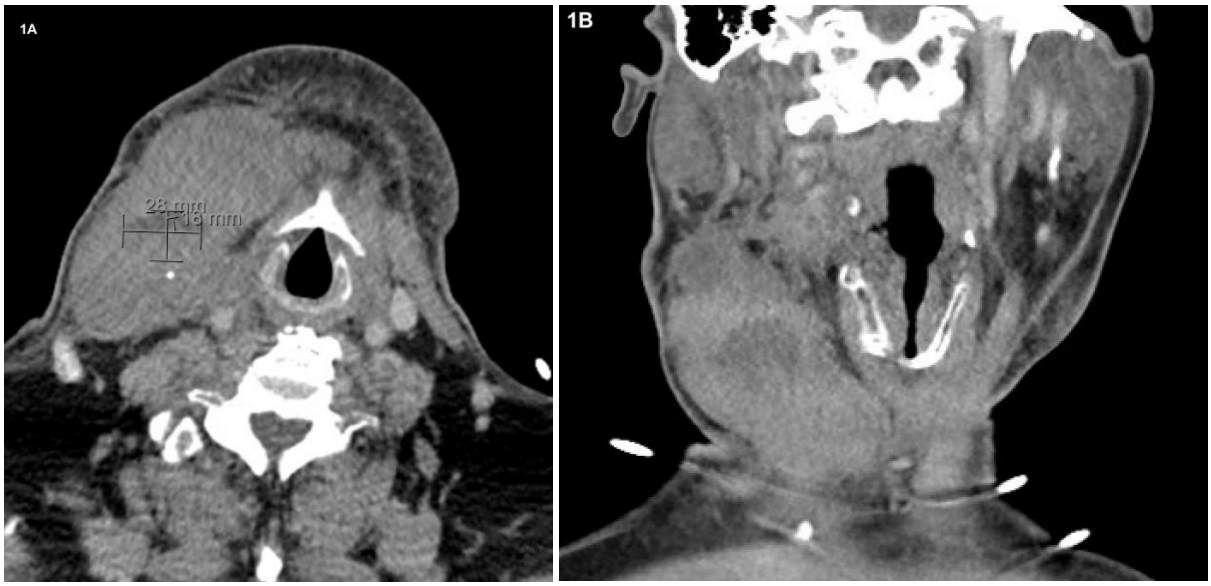

Figure 1: CT angiogram of the neck demonstrating delayed post-thyroidectomy haematoma. (A) axial contrast-enhanced CT image showing a 105 mm right anterior neck haematoma with fluid filled level (28x18 mm, arrows) indicating active or recent bleeding, (B) coronal contrast-enhanced CT image showing the right anterior neck haematoma with mild leftward midline shift of the trachea. No active contrast extravasation was identified, and the airway remained patent without significant compression.

Table 1: Summary of literature on post-thyroidectomy haematoma and anticoagulation.

Author	Year	Study type	Sample size	Anticoagulation	Timing of haematoma	Key findings
Calo et al[5]	2013	Case report	2	Acenocoumarol	13 days	Very late cervical haematoma after total thyroidectomy
Oltmann et al[11]	2016	Retrospective cohort	4,514	DOAC, warfarin +/- heparin or LMWH bridging	0–6 days	Post-thyroidectomy haematoma rate increases 5.5-fold with oral anticoagulant and 26.8-fold with injectable anticoagulant (0.4% vs 2.2% vs 10.7%, < 0.001)
Lui et al[10]	2017	Meta-analysis	424,563	Unspecified anticoagulants	Not reported	Antithrombotic use increases the frequency of post-thyroidectomy bleed by nearly two-fold, even if the usage was stopped 5–7 days (or 1.96, 95% CI=1.55–2.49, p<0.00001) before operation

Continued.

Author	Year	Study type	Sample size	Anticoagulation	Timing of haematoma	Key findings
Fan et al[9]	2019	Meta-analysis	452,799	Unspecified anticoagulants	Not reported	Anticoagulants are associated with nearly two-fold increased haematoma risk (or 1.92, 95% CI:1.51-2.44, p<0.00001)
Tausanovic et al[12]	2022	Case-control study	6,938	Warfarin + LMWH bridging	0–6 days	95.8% of post-thyroidectomy haematoma occurred within the first 24h
Canu et al[8]	2025	Case-control study	316	DOAC	<24 hours	No significant difference between post-thyroidectomy haematoma incidence (5.70% vs 4.43%, p=0.608) and timing of onset of haematoma in DOAC vs control group when perioperative management was optimised
Annesi et al[7]	2025	Prospective cohort	805	Warfarin, unspecified anticoagulants	0–6 days	6 patients (0.7%) had post-thyroidectomy central neck haematoma, 3 of whom were on anticoagulant
Abboud et al[6]	2025	Retrospective cohort study	5,324	DOAC / warfarin +/- heparin or LMWH bridging	<24 hours	Anticoagulation was associated with 5.2-times increase in post-thyroidectomy haematoma rate (26% vs 5% in anticoagulation vs control group, p<0.001)

LMWH=low molecular weight heparin (eg. Enoxaparin).

He subsequently underwent emergency cervical re-exploration. Intraoperatively, an actively bleeding small vessel between the sternocleidomastoid and platysma was identified and clipped. Blood and clot were evacuated from the anterior neck compartment. Notably, a separate seroma was identified deep to the infrahyoid muscles in the thyroid bed and was evacuated. There was no haematoma within the deep neck compartment. Thorough irrigation was performed and Surgicel® Fibrillar™ was applied to the subplatysmal and lateral neck spaces for haemostasis. The operation was then completed with insertion of a 19 French drain into the superficial compartment, followed by layered closure of the neck. Postoperatively, he was monitored in the intensive care unit and received intravenous dexamethasone 8mg for airway oedema prophylaxis. He was successfully extubated on POD1, transferred to the ward on POD2, and the drain was removed on POD 3 with minimal output. His recovery was uneventful and he was discharged home on POD 3 following haematoma evacuation. A multidisciplinary discussion with cardiologists weighing his thromboembolic risk (CHA2DS2-VASc score of 2) against bleeding risk was made, and rivaroxaban was recommenced on POD 7 with outpatient clinic review.

DISCUSSION

Post-thyroidectomy haemorrhage occurs in approximately 0.45–4.2% of cases but remains one of the most feared complications because expanding bleeding within a confined cervical compartment can rapidly compromise the airway.[1,2] Approximately 75–85% of haemorrhagic events occur within the first 24 hours, most frequently within the first 6 hours postoperatively.[1-5] However, delayed haemorrhage beyond the early postoperative period is recognised but remains rare.[5]

A synthesis of available literature of case reports, cohort studies and meta-analyses (Table 1) demonstrates that anticoagulation is consistently associated with an increased risk of postoperative bleeding, although the majority of haematomas occur within the first 6 hours.[5-12] Reports of delayed bleeding several days to weeks after surgery remain limited primarily to isolated case reports and small observational series, highlighting the unusual timing of the present case.[5,7,11,12]

Recognised risk factors for post-thyroidectomy haemorrhage include male sex, advanced age, Graves' disease, hypertension, the use of antithrombotic therapy, bilateral thyroidectomy, neck dissection and previous thyroid surgery.[9,10] In this case, patient-related factor (male sex, older age, therapeutic anticoagulation), pathology and surgical factors (thyroid malignancy requiring total thyroidectomy with lateral neck dissection and creation of a large subplatysmal flaps) collective increased the baseline risk of bleeding. The temporal relationship between DOAC recommencement and symptom onset strongly suggests anticoagulation as the main contributing factor. Early haemoserous wound ooze following DOAC resumption may have represented disrupted haemostasis that progressed to delayed bleeding. The seroma may have developed early postoperatively and transformed into a haematoma following DOAC recommencement. This suggests that

fluid collections present at the time of DOAC recommencement may add to vascular and soft tissue vulnerability, even when initial haemostasis appears satisfactory.

Accordingly, the absence of early haematoma does not preclude subsequent haemorrhagic complications in anticoagulated patients, underscoring the need to optimise modifiable risk factors and to maintain vigilance across the preoperative, intraoperative and postoperative phases. General perioperative guidelines recommend resumption of DOACs 48–72 hours after high bleeding risk surgery, with longer interruption for impaired renal function or very high bleeding risk operations.[13] However, these recommendations are largely extrapolated from non-head-and-neck surgery. A recent multicentre retrospective study published in 2025 suggests that when perioperative management is optimised, DOAC use does not significantly increase the overall rate of postoperative neck haematoma nor alter the timing of the bleed.[8]

DOACs should be resumed cautiously following thyroid surgery, with multidisciplinary decision-making involving the operating surgeon, cardiologist and anaesthetist. This collaborative approach enables individualised assessment of surgical complexity, patient factors and thromboembolic risk stratification.[6-11]

CONCLUSION

The recommencement of DOACs in head and neck surgery is a balanced approach of risk and benefits involving a multidisciplinary team and individualised decision making. Patients must be counselled about delayed warning signs that warrant immediate medical assessment, given delayed haematomas can occur days after discharge despite uneventful initial recovery.

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