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## Respiratory Medicine Case Reports

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## Case report

## Upper airway hematoma: An unusual presentation of acute upper airway obstruction

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## ABSTRACT

Acute upper airway obstruction secondary to supraglottic hematoma is a rare but life-threatening complication of oral anticoagulants, particularly with warfarin. Symptoms include sore throat, dysphagia, odynophagia, dysphonia, neck swelling, and dyspnea. We are reporting a case of an elderly male on warfarin therapy who developed acute upper airway obstruction due to spontaneous supraglottic hemorrhage. Commonly reported sites of spontaneous bleeding are the sublingual and retropharyngeal spaces.

## 1. Introduction

Bleeding is a severe and sometimes fatal complication of chronic anticoagulation. Spontaneous bleeding into the upper airways causing acute airway obstruction is a potentially fatal complication. A high index of suspicion for this complication with emergent intervention, like in this case, can be lifesaving. Direct Acting Oral Anticoagulants (DOACs) have lower bleeding complications than warfarin. Despite a better safety profile of DOACs, most clinicians still prefer to use warfarin over the newer oral anticoagulants [9,10].

## 2. Case report

A 70-year-old male with a past medical history of hypertension, diabetes mellitus type 2, chronic kidney disease stage III, metastatic prostate cancer, chronic atrial fibrillation, and chronic systolic heart failure presented with a one-day history of sore throat, blood-tinged saliva dysphagia, and dyspnea. He was on Coumadin 7.5 mg every day. On examination, he had stridor. Blood workup revealed an elevated international normalized ratio (INR) of 16; X-ray and CT neck revealed a severe soft tissue swelling in the supraglottic region [Figs. 1–2]. CT chest showed normal lower airways and lung parenchyma. Tracheal intubation was attempted but unsuccessful necessitating emergent cricothyroidotomy for establishing a patent airway. Then he underwent an emergent tracheostomy. Supratherapeutic INR was reversed with intravenous vitamin K and fresh frozen plasma. Direct laryngoscopy revealed severe soft tissue swelling due to hematoma involving the supraglottic structures [Fig. 3]. Flexible bronchoscopy via tracheostomy tube showed an average endobronchial tree with no evidence of active bleeding. After ten days, he was started on Eliquis, which he tolerated without bleeding complications. The swelling in the upper airway was monitored closely by direct visualization. Repeat direct laryngoscopy on day sixteen revealed resolution of the upper airway swelling. Bedside swallow evaluation, including modified

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Fig. 1. Plain radiography of the neck.



Fig. 2. CT of the neck.

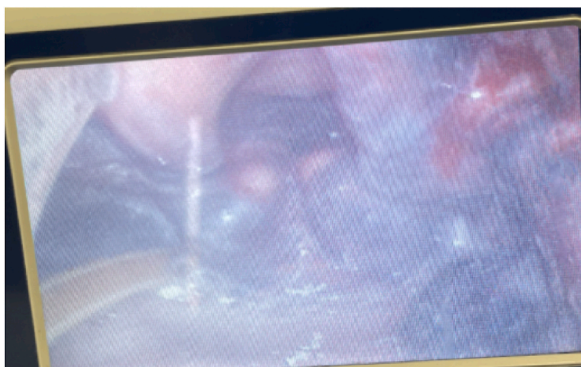


Fig. 3. Spontaneous hemorrhage with supraglottic hematoma causing acute upper airway obstruction.

barium swallow, was within normal limits. He was decannulated on day twenty, monitored for another 24 h, and discharged home on day twenty-one.

### 3. Discussion

Warfarin-induced upper airway hematoma is a potentially life-threatening bleeding complication. Fortunately, this is a rare complication and occurs primarily in elderly patients with supratherapeutic INR. Sublingual hematoma is the commonest site and occurs in up to 67% of the reported cases. Other reported areas of hematoma include retropharyngeal, submaxillary, epiglottis, and vocal cords [1–5]. Once the diagnosis is confirmed, the mainstay of treatment is to ensure an adequate airway and reverse coagulopathy. These patients should be monitored closely in the intensive care unit. If the airway is compromised, then fiber-optic guided

nasotracheal intubation should be attempted with precautions not to cause more trauma to the upper airway. Emergent cricothyroidotomy and tracheostomy should be considered if the nasotracheal or orotracheal intubation fails [1]. In patients with severe retropharyngeal hemorrhage, surgical evacuation may be an option but is usually not indicated [6]. Empiric use of systemic steroids and antibiotics have no role in managing upper airway hematoma due to systemic anticoagulation [7]. Most of the reported anticoagulation-related upper airway hematoma cases are caused by warfarin. So far, there has been only one reported case of retropharyngeal hematoma caused by DOAC (Rivaroxaban) [8]. Despite a better safety profile and convenience of using the DOACs, warfarin use increased by nearly 3-fold between 1996 and 2011. Most clinicians participating in the Medicare Part D program continued to use warfarin as their predominant or only anticoagulant instead of DOACs in 2018. In 2019, warfarin was one of the three most used anticoagulant medications [9,10]. Even though this is a rare complication, treating clinicians should maintain a high index of suspicion and evaluate and treat promptly to prevent a fatal outcome. Switching them to DOACs may be a reasonable option for high-risk patients who continue to require systemic anticoagulation [11].

### Declaration of competing interest

We have no conflicts to declare.

### References

- [1] P. Karmacharya, R. Pathak, S. Ghimire, P. Shrestha, S. Ghimire, D.R. Poudel, R. Khanal, S. Shah, M.R. Aryal, R.L. Alweis, Upper airway hematoma secondary to warfarin therapy: a systematic review of reported cases, *N. Am. J. Med. Sci.* 7 (11) (2015 Nov) 494–502, <https://doi.org/10.4103/1947-2714.170606>. PMID: 26713297; PMCID: PMC4683804.
- [2] H.D. Kerr, A. Kwaselow, Vocal cord hematomas complicating anticoagulant therapy, *Ann. Emerg. Med.* 13 (7) (1984 Jul) 552–553, [https://doi.org/10.1016/s0196-0644\(84\)80530-2](https://doi.org/10.1016/s0196-0644(84)80530-2). PMID: 6742561.
- [3] R. Ikeda, T. Chiba, S. Gorai, T. Kobayashi, Upper airway obstruction by epiglottitis and arytenoids hematoma in a patient treated with warfarin sodium, *Auris Nasus Larynx* 37 (1) (2010 Feb) 114–116, <https://doi.org/10.1016/j.anl.2009.03.010>. Epub 2009 May 1. PMID: 19410398.
- [4] Stacy Weeks Jandreau, Dan Mayer, Spontaneous bilateral arytenoid hematoma in a patient on warfarin, *Am. J. Emerg. Med.* 16 (Issue 7) (1998) 674–676, [https://doi.org/10.1016/S0735-6757\(98\)90174-7](https://doi.org/10.1016/S0735-6757(98)90174-7). ISSN 0735-6757.
- [5] A.F. Cohen, S.P. Warman, Upper airway obstruction secondary to warfarin-induced sublingual hematoma, *Arch. Otolaryngol. Head Neck Surg.* 115 (6) (1989 Jun) 718–720, <https://doi.org/10.1001/archotol.1989.01860300072020>. PMID: 2655669.
- [6] M.G. Genovesi, D.H. Simmons, Airway obstruction due to spontaneous retropharyngeal hemorrhage, *Chest* 68 (6) (1975 Dec) 840–842, <https://doi.org/10.1378/chest.68.6.840>. PMID: 53128.
- [7] P. Gooder, R. Henry, Impending asphyxia induced by anticoagulant therapy, *J. Laryngol. Otol.* 94 (3) (1980 Mar) 347–352, <https://doi.org/10.1017/s0022215100088885>. PMID: 6966306.
- [8] Jonathan Andrew McCarter, et al., Rivaroxaban and retropharyngeal haemorrhage, *bcr2015212446*, *BMJ Case Rep.* 2016 (16 Feb. 2016), <https://doi.org/10.1136/bcr-2015-212446>.
- [9] A. Troy, H.S. Anderson, National trends in use of and spending on oral anticoagulants among US Medicare beneficiaries from 2011 to 2019, *JAMA Health Forum* 2 (7) (2021), e211693, <https://doi.org/10.1001/jamahealthforum.2021.1693>.
- [10] K.M. Wheelock, J.S. Ross, K. Murugiah, Z. Lin, H.M. Krumholz, R. Khera, Clinician trends in prescribing direct oral anticoagulants for US Medicare beneficiaries, *JAMA Netw. Open* 4 (12) (2021), e2137288, <https://doi.org/10.1001/jamanetworkopen.2021.37288>.
- [11] Y.P. Wang, R. Kehar, A. Iansavitchene, A. Lazo-Langner, Bleeding risk in nonvalvular atrial fibrillation patients receiving direct oral anticoagulants and warfarin: a systematic review and meta-analysis of observational studies, *TH Open* 4 (3) (2020) e145–e152, <https://doi.org/10.1055/s-0040-1714918>, 2020 Jul 13.