

Management of Upper Airway Hematoma Secondary to Anticoagulants

Oussama Amraoui*, Hajar Ait Taleb, Sophia Nitassi, Razika Bencheikh, Abdelilah Oujilal, Leila Essakalli

Department of Otolaryngology, Head and Neck Surgery, Ibn Sina University Hospital, University Mohamed 5, Rabat, Morocco

DOI: [10.36348/sb.2020.v06i11.001](https://doi.org/10.36348/sb.2020.v06i11.001)

| Received: 19.09.2020 | Accepted: 27.09.2020 | Published: 30.11.2020

*Corresponding author: Amraoui Oussama

Abstract

Hemorrhagic complications from anticoagulants are very common. Their occurrence in a critical site such as the upper airways constitutes a vital emergency. Management must ensure antagonization of the anticoagulant effect and freedom of the upper airways. We will illustrate this through a clinical case with all the clinical signs that can alert a hematoma of the upper airways, the reversion strategies of old and new anticoagulants and respiratory management. We recommend admitting the patient to an intensive care unit, withholding anticoagulants and administering vitamin K and prothrombin complex concentrate as a means of reversing AVK. For direct oral anticoagulants, their cessation may be sufficient, otherwise non-specific reversion means are used, given the unavailability of antidotes apart from Idarucizumab for Dabigatran. For respiratory management we recommend a conservative attitude and in case of deterioration of the respiratory function a nasotracheal intubation under endoscopic guidance by an experienced doctor should be done. The resumption of anticoagulants must be decided according to the benefit risk ratio while involving the patient too and also taking into consideration the possibility of changing anticoagulants.

Keywords: Hemorrhagic, Prothrombin complex concentrate, direct oral anticoagulants, airway management.

Copyright @ 2020: This is an open-access article distributed under the terms of the Creative Commons Attribution license which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use (NonCommercial, or CC-BY-NC) provided the original author and source are credited.

INTRODUCTION

Upper Airway hematoma secondary to an overdose of anticoagulants is rare. However, its management constitutes an emergency and must be consual. Unfortunately until today there is no consensus of care. Most cases reported in the literature describe a hematoma in a single upper airway site with its specific clinical manifestations and its special management. We report through our case, which has the particularity of a multifocal damage affecting sublingual region, rooth of tongue, vallecule and arytenoids, the various possible clinical manifestations of an upper airway hemorrhagic syndrome, direct and classic oral anticoagulants reversal strategies and airway management. Finally, we will discuss reconsiderations for restarting anticoagulation.

CASE REPORT

A 56 years old woman was admitted to the emergency department of our hospital, with a six day history of an unceasing cough does not improve with symptomatic treatment. The evolution was marked by an installation of respiratory discomfort for which she was admitted to the emergency. The past medical

history included hypertension, diabetes type 2 and peripheral artery disease for which she was amputated of the 2 lower limbs in 2001. Her medication included vitamin K antagonist (fluindione), antiplatelet agent (acetylsalicylic acid), antihypertensive treatment (association of valsartan and hydrochlorothiazide) and oral hypoglycemic agents (metformin).

On admission, the patient presented laryngeal dyspnea with stridor without signs of respiratory depression. Examination revealed large bruising around the front of the neck, a haematoma of the floor of the mouth (Figure-1). Nasofibroscope showed an extension of the bruises towards rooth of tongue, vallecule and arytenoids with a narrowed laryngeal pathway.

Biological examinations found an INR greater than 10 and C reactive protein at 79mg/l. CT-Scan showed a hemorrhagic infiltration of the fatty tissue under the skin of the anterior cervical region as well as the rooth of the tongue, a narrowing of supraglottic and glottic air pathway, without other hemorrhagic foci.

Our patient was transferred to intensive care unit for close monitoring with preparation of the nasoguided intubation equipment and that of a possible tracheotomy in case of intubation failure. She was given prothrombin complex concentrate (Octaplex 500), vitamin K intravenously and adrenaline and pulmicort nebulizations. The evolution was marked by the progressive regression of the bruises (Figure-2), the improvement of the respiratory state with disappearance of the stridor. Biologically, the INR dropped to 1.5.



Fig-1: Patient with cervical bruise and hematoma of the floor of the mouth



Fig-2: Photo showing the complete disappearance of the hematoma after 5 days

DISCUSSION

Despite the advent of direct oral anticoagulants (DOACs), the hemorrhagic complications of this therapeutic class are still topical. This hemorrhagic risk is the leading cause of iatrogenic hospitalization in France. Vitamin K antagonists (VKAs) are characterized by a great variability of response essentially by drug and food interactions. This variability requires biological monitoring by the INR of the anticoagulant effect obtained to avoid an overdose and therefore serious side effects, especially since the therapeutic index of VKAs is narrow. Faced with these constraints, DOACs appeared, devoid of food interactions [1] and having fewer drug interactions [2] and do not need biological monitoring. However, hemorrhagic events have been reported in patients on DOACs. The risk of intracranial hemorrhage was only half in a comparative study between new and old anticoagulants [3]. The locations most frequently interested in bleeding secondary to an overdose of anticoagulants are intracranial cavity, gastrointestinal tract and genitourinary system [4]. Upper airways are rarely involved, cases affecting submandibular space, sublingual space, parapharyngeal and retropharyngeal space, arytenoids and vocal cords [5-7]. The sublingual space is the most affected (66,57%) followed by the retropharyngeal space (27,03%) in a meta-analysis of upper airway hematoma secondary to anticoagulants [8].

Symptoms of upper airway hematoma depend on the exact location of the latter and can range from a sore throat, which must be taken seriously in any patient on anticoagulants [7], up to laryngeal dyspnea [5]. The clinical examination may find a cervical bruise, a sublingual hematoma, a cervical mass and signs of respiratory depression [9]. Biologically, the risk of bleeding with VKAs is related to INR in a log linear fashion [4] and is known to be higher with an INR > 4,5 [10]. Biological monitoring for DOACs is only indicated in certain cases to measure the anticoagulant activity in the event of a hemorrhagic syndrome [11]. This surveillance is based on usual hemostasis tests like prothrombin time, partial thromboplastin time and thrombin time [12, 13] and on specific tests measuring anti-factor IIa activity for Dabigatran and anti-factor Xa activity for the xabans [14]. In our case, the patient was on VKA and at the same time on anti platelet agents which potentiate the risk of hemorrhage [4].

Clinically, the patient had presented an unceasing cough, on admission she was in laryngeal dyspnea with a stridor, the inspection found a large cervical bruise and a hematoma of the floor of the mouth. Nasofibroscope has shown an extension of this hemorrhagic syndrome to the root of tongue, vallecula and arytenoids. This clinical signs illustrate a multifocal bleeding of the upper airway with all the symptoms described in the literature.

The patient's biology found an INR greater than 10. The CT scan did not objectify other hemorrhagic foci.

Upper airway hematoma secondary to anticoagulants constitutes a vital emergency, its management is based on 3 aspects. The first aims to stop the bleeding, the second is for airway management and the third is based on surgical drainage in some cases.

Stopping the bleeding requires stopping the anticoagulation and administering reversal agents. For VKA, vitamin K should be administered slow intravenously at a dose of 5-10 mg combined with fresh frozen plasma (FFP) or a prothrombin complex concentrate. The latter is used at a dose which is a function of the INR and of the weight and it has the advantage that it does not require ABO compatibility and can be stored at room temperature. However, it presents a risk of disseminated intravascular coagulation [9] and thromboembolic accidents. FFP has the advantage of availability and cost, but it can be the cause of serious side effects such as circulatory volume overload [15], allergic reactions, thromboembolic accidents and all possible transfusion accidents including the risk of viral transmission [16].

Regarding Dabigatran, given its short duration of action, withholding treatment may be sufficient and the anticoagulant effect will decrease rapidly [17]. In the event of severe bleeding the administration of Idarucizumab, which constitutes the specific reversing agent of Dabigatran, is essential [18]. For xabans, there is no specific antidote, the Andexanet alpha is under study [19]. Prothrombin complex concentrate and activated prothrombin complex concentrate have been proposed as non-specific reversal means [20] but at the cost of a high thrombotic risk [21, 22].

For respiratory care, there is no definite consensus in the literature. Some favor aggressive respiratory management from the start [7]. Others prefer in front of a stable respiratory state to achieve an antagonization of the anticoagulant effect with monitoring in an intensive care unit [23, 9].

In our case we recommended the monitoring of the patient in an intensive care unit after having implemented the antagonization measures and prepared the intubation and emergency tracheotomy equipment which risk doing this in catastrophe given the reduction in the caliber of the laryngeal lumen by the hematoma, BMI>30, Mallampati score at 4, the cervical bruise and the patient's short neck. Studies have shown an equivalence of results between the expectation attitude and the aggressive attitude [8]. The intubation must be nasotracheal, under endoscopic guidance and performed by an experienced doctor [8, 24]. Tracheotomy or

cricothyrotomy should only be done if intubation is contraindicated. The use of corticosteroids and antibiotics is controversial. Gooder and Henry [25] link these hemorrhagic accidents to local infections causing vasodilation and then hemorrhage, which justifies the use of antibiotics. Other authors report no benefit from the use of these drugs [6].

Among the therapeutic methods also used the application of leeches on the hematomas of the floor of the mouth over a period of 2 hours with good results [26]. Surgical drainage of hematomas has been described in some cases, but with poor results [27]. The spontaneous resolution of hematomas after a few days of the disappearance of the anticoagulant effect has been very often observed. Such was the case of our patient who after administration of Octaplex and vitamin k saw her INR decreased from 10 to 1.5 with regression of hematomas after 5 days.

Finally, the question arises of the resumption of anticoagulants after the improvement of the patients' condition. The indication for the anticoagulant must be reassessed by evaluating this risk-benefit within the framework of a multidisciplinary team while involving the patient himself [16]. This reconsideration must take into account the thrombotic risk of the underlying disease, location of the hemorrhage, renal function of the patient and possibility of changing anticoagulants. In case of high thrombotic risk, the resumption of anticoagulants must be early even if there is a risk of re-bleeding. However, the anticoagulation must be initially parenteral with close monitoring [16].

REFERENCES

1. Vranckx, P., Valgimigli, M., & Heidbuchel, H. (2018). The Significance of Drug–Drug and Drug–Food Interactions of Oral Anticoagulation. *Arrhythmia & Electrophysiology Review*, 7(1), 55. <https://doi.org/10.15420/aer.2017.50.1>
2. Chang, S. H., Chou, I. J., Yeh, Y. H., Chiou, M. J., Wen, M. S., Kuo, C. T., ... Kuo, C. F. (2017). Association Between Use of Non–Vitamin K Oral Anticoagulants With and Without Concurrent Medications and Risk of Major Bleeding in Nonvalvular Atrial Fibrillation. *JAMA*, 318(13), 1250. <https://doi.org/10.1001/jama.2017.13883>
3. Chen, S. J., Yeh, S. J., Tang, S. C., Lin, S. Y., Tsai, L. K., & Jeng, J. S. (2020). Similar outcomes between vitamin K and non-vitamin K antagonist oral anticoagulants associated intracerebral hemorrhage. *Journal of the Formosan Medical Association*, 119(1), 106-112. <https://doi.org/10.1016/j.jfma.2019.02.008>
4. Bloom, D. C., Haegen, T., & Keefe, M. A. (2003). Anticoagulation and spontaneous retropharyngeal hematoma. *The Journal of Emergency*

- Medicine*, 24(4), 389-394. [https://doi.org/10.1016/s0736-4679\(03\)00035-0](https://doi.org/10.1016/s0736-4679(03)00035-0)
5. Boster, S. R., & Bergin, J. J. (1983). Upper airway obstruction complicating warfarin therapy — with a note on reversal of warfarin toxicity. *Annals of Emergency Medicine*, 12(11), 711-715. [https://doi.org/10.1016/s0196-0644\(83\)80424-7](https://doi.org/10.1016/s0196-0644(83)80424-7)
 6. Jandreau, S. W., & Mayer, D. (1998). Spontaneous bilateral arytenoid hematoma in a patient on warfarin. *The American Journal of Emergency Medicine*, 16(7), 674-676. [https://doi.org/10.1016/s0735-6757\(98\)90174-7](https://doi.org/10.1016/s0735-6757(98)90174-7)
 7. Cohen, A. F., & Warman, S. P. (1989). Upper Airway Obstruction Secondary to Warfarin-Induced Sublingual Hematoma. *Archives of Otolaryngology - Head and Neck Surgery*, 115(6), 718-720. <https://doi.org/10.1001/archotol.1989.01860300072020>
 8. Karmacharya, P., Pathak, R., Ghimire, S., Shrestha, P., Ghimire, S., Poudel, D., ... Alweis, R. (2015). Upper airway hematoma secondary to warfarin therapy: A systematic review of reported cases. *North American Journal of Medical Sciences*, 7(11), 494. <https://doi.org/10.4103/1947-2714.170606>
 9. González-García, R., Schoendorff, G., Muñoz-Guerra, M. F., Rodríguez-Campo, F. J., Naval-Gías, L., & Sastre-Pérez, J. (2006). Upper airway obstruction by sublingual hematoma: a complication of anticoagulation therapy with acenocoumarol. *American Journal of Otolaryngology*, 27(2), 129-132. <https://doi.org/10.1016/j.amjoto.2005.07.013>
 10. Bapat, V. (2002). Retropharyngeal hematoma — a rare complication of anticoagulant therapy. *European Journal of Cardio-Thoracic Surgery*, 21(1), 117-118. [https://doi.org/10.1016/s1010-7940\(01\)01070-3](https://doi.org/10.1016/s1010-7940(01)01070-3)
 11. Mismetti, P., & Laporte, S. (2010). New oral antithrombotics: a need for laboratory monitoring. *For. Journal of Thrombosis and Haemostasis*, 8(4), 621-626. <https://doi.org/10.1111/j.1538-7836.2010.03764.x>
 12. Tripodi, A. (2013). The Laboratory and the New Oral Anticoagulants. *Clinical Chemistry*, 59(2), 353-362. <https://doi.org/10.1373/clinchem.2012.189704>
 13. Martinoli, J. L., LeFlem, L., Guinet, C., Plu-Bureau, G., Depasse, F., Perzborn, E., & Samama, M. M. (2010). Assessment of laboratory assays to measure rivaroxaban — an oral, direct factor Xa inhibitor. *Thrombosis and Haemostasis*, 103(04), 815-825. <https://doi.org/10.1160/th09-03-0176>
 14. Pernod, G., Albaladejo, P., Godier, A., Samama, C. M., Susen, S., Gruel, Y., ... Sié, P. (2013). Management of major bleeding complications and emergency surgery in patients on long-term treatment with direct oral anticoagulants, thrombin or factor-Xa inhibitors: Proposals of the Working Group on Perioperative Haemostasis (GIHP) — March 2013. *Archives of Cardiovascular Diseases*, 106(6-7), 382-393. <https://doi.org/10.1016/j.acvd.2013.04.009>
 15. Sarode, R., Milling, T. J., Jr, Refaai, M. A., Mangione, A., Schneider, A., Durn, B. L., & Goldstein, J. N. (2013). Efficacy and Safety of a 4-Factor Prothrombin Complex Concentrate in Patients on Vitamin K Antagonists Presenting With Major Bleeding. *Circulation*, 128(11), 1234-1243. <https://doi.org/10.1161/circulationaha.113.002283>
 16. Tomaselli, G. F., Mahaffey, K. W., Cuker, A., Dohesh, P. P., Doherty, J. U., Eikelboom, J. W., ... Wiggins, B. S. (2017). 2017 ACC Expert Consensus Decision Pathway on Management of Bleeding in Patients on Oral Anticoagulants. *Journal of the American College of Cardiology*, 70(24), 3042-3067. <https://doi.org/10.1016/j.jacc.2017.09.1085>
 17. Heidbuchel, H., Verhamme, P., Alings, M., Antz, M., Diener, H. C., Hacke, W., ... Kirchhof, P. (2016). Updated European Heart Rhythm Association practical guide on the use of non-vitamin-K antagonist anticoagulants in patients with non-valvular atrial fibrillation: Executive summary. *European Heart Journal*, ehw058. <https://doi.org/10.1093/eurheartj/ehw058>
 18. Reilly, P. A., Bernstein, R., Dubiel, R., Eikelboom, J., Glund, S., Huisman, M. V., ... Pollack, C. V., Jr. (2015). Design and rationale for RE-VERSE AD: A phase 3 study of idarucizumab, a specific reversal agent for dabigatran. *Thrombosis and Haemostasis*, 114(07), 198-205. <https://doi.org/10.1160/th15-03-0192>
 19. Lu, G., DeGuzman, F. R., Hollenbach, S. J., Karbarz, M. J., Abe, K., Lee, G., ... Sinha, U. (2013). A specific antidote for reversal of anticoagulation by direct and indirect inhibitors of coagulation factor Xa. *Nature Medicine*, 19(4), 446-451. <https://doi.org/10.1038/nm.3102>
 20. Marlu, R., Hodaj, E., Paris, A., Albaladejo, P., Crackowski, J., & Pernod, G. (2012). Effect of non-specific reversal agents on anticoagulant activity of dabigatran and rivaroxaban. *Thrombosis and Haemostasis*, 108(08), 217-224. <https://doi.org/10.1160/th12-03-0179>
 21. Levi, M., Levy, J. H., Andersen, H. F., & Truloff, D. (2010). Safety of Recombinant Activated Factor VII in Randomized Clinical Trials. *New England Journal of Medicine*, 363(19), 1791-1800. <https://doi.org/10.1056/nejmoa1006221>
 22. Tamayo, S., Frank Peacock, W., Patel, M., Sicignano, N., Hopf, K. P., Fields, L. E., ... Yuan, Z. (2015). Characterizing Major Bleeding in Patients With Nonvalvular Atrial Fibrillation: A

- Pharmacovigilance Study of 27 467 Patients Taking Rivaroxaban. *Clinical Cardiology*, 38(2), 63-68. <https://doi.org/10.1002/clc.22373>
23. Cashman, E., Shandilya, M., Amin, M., Hughes, J., & Walsh, M. (2011). Warfarin-Induced Sublingual Hematoma Mimicking Ludwig Angina: Conservative Management of a Potentially Life-Threatening Condition. *Ear, Nose & Throat Journal*, 90(2), E1-E3. <https://doi.org/10.1177/014556131109000208>
24. Lim, M., Chaudhari, M., Devesa, P. M., Waddell, A., & Gupta, D. (2006). Management of upper airway obstruction secondary to warfarin therapy: the conservative approach. *The Journal of Laryngology & Otology*, 120(2), 1-2. <https://doi.org/10.1017/s0022215105001982>
25. Gooder, P., & Henry, R. (1980). Impending asphyxia induced by anticoagulant therapy. *The Journal of Laryngology & Otology*, 94(3), 347-352. <https://doi.org/10.1017/s0022215100088885>
26. Lee, N. J., & Peckitt, N. S. (1996). Treatment of a sublingual hematoma with medicinal leeches: Report of case. *Journal of Oral and Maxillofacial Surgery*, 54(1), 101-103. [https://doi.org/10.1016/s0278-2391\(96\)90314-6](https://doi.org/10.1016/s0278-2391(96)90314-6)
27. Scully, C., & Wolff, A. (2002). Oral surgery in patients on anticoagulant therapy. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology*, 94(1), 57-64. <https://doi.org/10.1067/moe.2002.123828>