



# PSEUDO-LUDWIG'S ANGINA: SPONTANEOUS SUBLINGUAL HAEMATOMA ELICITED BY WARFARIN

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## ABSTRACT

Spontaneous bleeding into the upper airways is a rare and potentially life-threatening complication of chronic anticoagulation. There are scarce cases in the literature demonstrating upper airway haematomas secondary to warfarin use, which is the predominant anticoagulant used by clinicians despite having a complex pharmacokinetic and pharmacodynamic profile. We report a compelling case featuring warfarin-induced sublingual haematoma, managed conservatively through the reversal of anticoagulation using fresh frozen plasma complemented by vigilant monitoring within the Intensive Care Unit (ICU).

## KEYWORDS

Pseudo-Ludwig's angina, warfarin, sublingual haematoma, upper airway bleeding

## LEARNING POINTS

- Sublingual haematomas, though uncommon, represent potentially serious complications arising from warfarin therapy.
- Distinguishing sublingual haematomas from infectious processes requires a high level of clinical suspicion and is crucial for prompt management.
- The preferred course of action involves reversing anticoagulation with a low threshold for implementing an artificial airway in cases of compromised airways.

## INTRODUCTION

In contrast to Ludwig's angina, which refers to an acute and severe inflammation of the oro- and hypopharynx that is commonly caused by bacterial infections, pseudo-Ludwig's angina is associated with spontaneous sublingual haematoma arising from non-infectious aetiologies<sup>[1]</sup>. A scarcity of case reports has established an association between sublingual haematoma and excessive anticoagulation, notably with warfarin or coagulopathy stemming from hepatic

dysfunction<sup>[2]</sup>. Upper airway bleeding, spontaneous or with minor trauma, can occur secondary to supratherapeutic international normalised ratio (INR) and holds clinical significance due to the risk of life-threatening airway obstruction. Our case involves the spontaneous occurrence of sublingual haematoma following warfarin anticoagulation, accompanied by a review of relevant literature. Additionally, we discuss the treatment approaches for this particular clinical entity.





Figure 1. Images demonstrate the extent of sublingual ecchymoses as well as the submental swelling upon presentation.

### CASE DESCRIPTION

Our patient is a 64-year-old female who presented to the emergency department with complaints of a muffled voice and progressively worsening tongue swelling since the previous day. She had a history of hyperlipidaemia, hypertension, aortic valve and mitral valve replacement, with the aortic valve being a mechanical type. Her medications included warfarin, metoprolol succinate and aspirin. She denied any sick contacts, fevers, chills, nausea, or vomiting. She noticed that the tissue underneath her tongue began to appear purple, as if there was a 'collection of blood' with gradual swelling accompanied by pain (Fig. 1). She had a muffled voice and difficulty swallowing, which prompted her to go to the emergency department. The patient reported that she had been following outpatients consistently, and her warfarin levels were adjusted accordingly without any problems to a goal INR of 2.5–3.5.

Upon further questioning, the patient reported recently drinking 1–2 bottles of grapefruit juice daily for 'health benefits'. In the emergency department, her blood work results revealed an INR of 6.2, significantly higher than the goal INR. Haemoglobin and platelet levels were 9.8 g/dl and 265,000/mm<sup>3</sup>, respectively, which were not significantly different from the patient's baseline. A computed tomography (CT) scan of the neck soft tissue with contrast did not demonstrate any extensive fluid collection or abscess in the hypopharynx or the tongue (Fig. 2). The patient was then admitted to the medical ICU for management of pseudo-Ludwig's angina and further monitoring. She was given two units of fresh frozen plasma for quick reversal of anticoagulation. The repeat INR after the plasma infusion was 2.2. The patient was then started on continuous heparin infusion, and her tongue, swelling and voice improved the following day (Fig. 3). The patient was later moved over to warfarin. She had no further bleeding and was later discharged home once the target INR was achieved.

### DISCUSSION

The reported incidence of bleeding in patients on warfarin, the mechanism of action of which is antagonising vitamin K,

is about 6.8%<sup>[3]</sup>. The propensity of bleeding, whether internal or external, exhibits a logarithmic-linear correlation with the INR, and it is established that the risk increases notably when INR levels exceed 4.5<sup>[4]</sup>. Managing anticoagulation with warfarin presents challenges due to established interactions with frequently prescribed medications, such as broad-spectrum antibiotics, quinidine, salicylate and thyroxine, and additionally, with alcohol and dietary factors that can alter INR<sup>[3]</sup>. Besides providing no discernible therapeutic advantage in preventing thromboembolism, an INR exceeding 4.5 substantially augments the risk of bleeding<sup>[5]</sup>. Upper airway haematomas are rarely observed and reported in contrast to gastrointestinal, genitourinary, and central nervous system bleedings secondary to supratherapeutic INR in patients on warfarin. Oral



Figure 2. CT neck soft tissue with contrast did not reveal any abscess or fat stranding around the tongue tissue, and was not suggestive of infectious aetiology.



Figure 3. Images demonstrate the evolution of the sublingual ecchymoses as well as the submental swelling the following day, which had improved significantly with improvement in the patient's voice.

anticoagulation-induced haematomas have been reported in various upper airway locations, including the sublingual space, retropharyngeal area, arytenoids and epiglottis<sup>[2,6]</sup>. An upper airway haemorrhage might be preceded by predisposing factors such as intense coughing and trauma, or it may manifest spontaneously. The typical presentation includes symptoms such as dysphagia, sore throat, neck swelling and hoarseness; however, in certain instances, there may be notable respiratory compromise<sup>[7]</sup>. Despite the absence of a consensus on management in the literature, in a significant proportion of previously documented cases, the approach to addressing sublingual haematoma induced by warfarin predominantly involved conservative management strategies, preferably under close monitoring in the ICU<sup>[8,9]</sup>. In their systematic review, Karmacharya et al. revealed that reversal of coagulopathy through the administration of vitamin K coupled with the use of fresh frozen plasma is the preferred treatment modality in patients with upper airway haematoma in the absence of respiratory compromise<sup>[8]</sup>. We found one case where the resolution of the sublingual haematoma was successfully achieved with the use of prothrombin complex concentrate in a patient with congestive heart failure<sup>[10]</sup>. The presence of airway compromise should be regarded as a medical emergency, given the potential for life-threatening bleeding to occur rapidly into the sublingual space. Establishing a definitive airway with fibre-optically-guided nasotracheal intubation is recommended as the primary method of management, but cricothyrotomy or awake tracheotomy may be considered in situations where nasotracheal intubation is not feasible, orotracheal intubation is contraindicated and mask ventilation is not possible<sup>[6-8]</sup>. Prophylactic antibiotics were administered in some cases; nonetheless, they are generally not indicated, as abscess formation is infrequent<sup>[8]</sup>.

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