



Severe orolingual angioedema leading to intubation after tenecteplase administration

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ABSTRACT

We present the case of a 67-year-old patient who was admitted for a cardiac procedure. Postprocedure the patient experienced hyperacute-onset language deficits. After ruling out contraindications and discussing the risks and benefits, intravenous tenecteplase (TNK) was administered for suspected acute ischemic stroke. Subsequently, the patient developed severe orolingual edema leading to intubation. The patient's condition improved with daily steroids, histamine 2 receptor blocking agents, and antihistamine medications, and she was ultimately discharged home in a stable condition. It is important to remember the possible side effects of intravenous thrombolysis treatment, as timely diagnosis and management can significantly impact the overall prognosis.

Introduction

Intravenous thrombolysis (IVT) is commonly used to treat acute ischemic stroke (1). However, the use of IVT is not without side effects, and the most common side effect is hemorrhagic conversion from ischemic stroke (2). Angioedema is another complication that can lead to life-threatening consequences (3). Tissue plasminogen activator (TPA) has been used as a thrombolytic agent; but in recent years, tenecteplase (TNK) has also become widely used worldwide. We present a case of life-threatening orolingual angioedema leading to intubation after

TNK administration for suspected acute ischemic stroke. The patient's clinical status improved with medical management.

Case Presentation

This is a case of a woman patient in her 60s who experienced severe tongue swelling leading to airway compromise and difficulty breathing and swallowing after TNK administration. She initially presented to the hospital for elective transcatheter aortic valve replacement for severe, low-grade aortic stenosis under monitored anesthesia care. After the procedure, she developed



word-finding difficulty with agitation and unequal pupils, leading to a code stroke. Her National Institutes of Health Stroke Scale score at bedside was 3, and it was notable for orientation only to self and language deficits, which are word-finding difficulties known as anomia. A head computed tomography (CT) scan showed no hemorrhage, and CT angiography ruled out large vessel occlusion. After discussing the risks and benefits, TNK was administered for a suspected acute ischemic stroke. Within 30 min after medication administration, the patient experienced tongue swelling and had difficulty breathing and swallowing. The initial physical examination revealed a firm tongue and floor of the mouth, with the tongue pushing posteriorly. The soft palate was still visible, but the uvula was not. The tongue appeared ecchymotic and congested. Due to rapid swelling and vascular congestion of the tongue, the patient was intubated to prevent airway compromise. During this time, her vital signs remained stable, with appropriate levels of oxygen saturation (Figure 1).

Additional examination revealed hematomas with oozing at the femoral artery puncture sites and left groin. The patient was started on 10 mg oral dexamethasone thrice daily and 20 mg famotidine twice daily. She also underwent bilateral decompressive aspiration of blood from the tongue due to concerns for hematoma, although only 1-2 mL of blood was aspirated. The patient's hemoglobin level fell to 5.3 g/dL on the same day, and she received 1 unit of packed red blood cells, with a follow-up hemoglobin measurement of 7.3 g/dL. Additionally, intravenous 50 mg diphenhydramine once daily was added to her treatment. At this point, her tongue became softer with reduced swelling and could fit inside the patient's mouth. In the following days, tongue size continued to decrease and tongue color became darker until it eventually reached nearly normal size and turgor. Her magnetic resonance imaging of the brain

revealed any findings concerning ischemic changes. Following TNK administration, the patient was extubated on day 3, and her tongue returned to nearly its baseline size, as shown in Figure 2, approximately after 5 days. Of note, the patient did not have a history of allergic reactions to medications or latex.

Discussion

IVT is a widely used treatment for patients with suspected acute ischemic stroke, and it has inclusion and exclusion criteria that help identify the most appropriate patients for this treatment. TNK has taken the place of TPA as the drug of choice in most institutions worldwide in the last year. TNK and TPA were reported to be equally effective, and TNK was found to be more affordable (4). The mechanism of action of TNK is related to the hydrolysis of plasminogen into plasmin, leading to the formation of bradykinin. Bradykinin causes vasodilation and increases vascular permeability, which causes the switching of intracellular fluid into interstitial spaces, resulting in angioedema (5). Orolingual angioedema can lead to life-threatening complications due to airway compromise and occurs in around 1-5% of patients receiving IVT for suspected acute ischemic stroke (6). Angioedema may occur during and after IVT treatment, frequently within 25 to 120 minutes after IVT initiation (7). It is important to remember to re-assess patients for signs and symptoms of IVT complications. Prior studies have reported that orolingual angioedema in patients after IVT was localized to the contralateral side of ischemic changes in the brain and was mostly seen in patients with insular cortex involvement due to autonomic dysregulation (7,8). Myslimi et al. (8) reported that 2.2% of patients developed orolingual angioedema, and those



Figure 1. Severe swollen, congested, and ecchymotic tongue after tenecteplase administration



Figure 2. Tongue after the clinical management of severe angioedema and extubation

on angiotensin-converting enzyme-1 agents were most likely to develop this complication. It is worth noting that our patient was not on these agents. This complication did not affect long-term prognosis and modified the Rankin scale if detected and addressed promptly (9). The standard treatment for angioedema mostly includes steroids, epinephrine antihistamines, and H2 blockers (3). In severe cases, the administration of a bradykinin B2 receptor antagonist, a recombinant of kallikrein-inhibiting protein, or fresh frozen plasma may be needed (8).

In this case report, the patient developed severe orolingual angioedema, leading to intubation due to airway compromise after receiving TNK. As reported by Shi et al. (10), in many similar cases, tongue swelling appeared on the ipsilateral side of the vascular injury. However, our patient did not present with imaging findings consistent with a vascular event and developed an allergic reaction. Pitts et al. (11) reported that there is no standardized algorithm highlighting the approach to TNK-related orolingual edema. She was treated with antihistamines, steroids, and H2-blocking agents and experienced clinical improvement without the need for medications previously reported to be used in severe cases. She was extubated successfully and discharged home.

Conclusion

IVT agents are widely used to treat suspected acute ischemic stroke in patients meeting the inclusion and exclusion criteria. Due to its mechanism of action, IVT may lead to angioedema, which is a known complication. In some cases, angioedema may be life-threatening due to impairment of life-sustaining functions, such as airway compromise and respiratory distress, in patients with orolingual edema. The standard management of angioedema includes antihistamines, H2 blocking agents, steroids, and epinephrine. As in our case, emergent intubation may be required in severe cases. This case highlights the importance of close monitoring of patients undergoing IVT for the early recognition of complications. Timely management is the main approach to prevent fatal complications.

Ethics

Informed Consent: Consent for publication was obtained from the patient.

Authorship Contributions

Surgical and Medical Practices - Concept - Design - Data Collection or Processing - Analysis or Interpretation - Literature Search - Writing: H.A-H., U.G.

Conflict of Interest: No conflict of interest was declared by the authors.

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