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Neck Hematoma after Intravenous Thrombolysis for Stroke Treatment

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Introduction

Bleeding is a feared adverse effect of intravenous thrombolysis. Despite the widespread use of intravenous recombinant tissue-type plasminogen activator (rtPA) in stroke, there are few significant extracranial bleedings [1–3]. We report a case of neck hematoma after intravenous rtPA for stroke, which to our best knowledge has not been previously described.

Case Report

A 49-year-old man with a history of alcohol abuse as well as cigarette and cannabis smoking was admitted due to the sudden onset of left body weakness while standing. There was no history

or sign of trauma. Neurological examination disclosed hemi-inattention, left gaze palsy, left homonymous hemianopia, dysarthria, left facial paresis, hemisensory loss and hemiparesis (NIHSS score 14). A brain computerized tomography (CT) scan was unremarkable. Platelet count, activated partial thromboplastin time and prothrombin time were normal. Intravenous rtPA administration was started 2.5 h after symptom onset with a total alteplase dose of 68 mg (0.9 mg/kg). Fifty minutes after perfusion start, hemi-inattention and limb weakness increased (NIHSS score 17). At the end of rtPA perfusion, a right cervical hematoma was noticed (fig. 1a). Cervical CT performed 1 h afterwards showed a hematoma surrounding the right internal carotid artery (ICA) extending to the subcutaneous neck tissue and a diminished caliber of the right ICA lumen (fig. 1b, c). There was no further deterioration of the neurological status or vital parameters, although an increase in the superficial neck hematoma was noticed. No specific treatment for the cervical hematoma was provided. The next day, brain CT confirmed a large infarction in the territory of the right middle cerebral artery. Cervical ultrasonography and digital brain angiography showed a non-atherosclerotic occlusion of the right ICA. Magnetic resonance imaging of the neck with fat-suppressed T₁-weighted sequences performed 2 weeks after stroke onset disclosed a hematoma surrounding the initial segment of the right ICA. Coagulation, autoimmunity and serological studies were unremarkable. A transesophageal echocardiogram revealed a 'patent foramen ovale'. The patient was discharged receiving aspirin 250 mg/day.

Fig. 1. **a** Neck hematoma. **b** Neck enhanced CT axial view shows hematoma (arrow), surrounding the right ICA which displays an increase in the external diameter. **c** Neck enhanced CT lateral view showing the right ICA with an irregular stenosis and tapered appearance. The hematoma surrounding the right ICA can be seen (arrow).

Discussion

Alteplase is highly specific for fibrin. This may contribute to few reports of significant extracranial bleedings in rtPA used within the label approval [4].

Neck hematoma could have had an extravascular or intramural origin. Taking into account that the hematoma surrounded the symptomatic ICA, an intramural origin of the hematoma could be considered. Nevertheless, there is no imagiological evidence of this. Although, theoretically, thrombolysis could promote intramural bleeding in dissections, we did not find reports of neck bleeding after thrombolysis in arterial dissection [5]. The major cohort which compared complications in patients with arterial dissection versus nondissections did not find excessive complications in dissection, which suggests safety of intravenous rtPA [6]. Concerning an extravascular origin, cervical CT did not show neck tumors or arteriovenous malformations. Another possibility is the occurrence of a neglected minor trauma which could have damaged the soft tissue and eventually the right ICA.

Neck hematoma can be life-threatening due to asphyxia and compression of major vascular structures. If the hematoma had progressed, rtPA reversal with cryoprecipitate [7] or fresh frozen plasma [8] and intubation could have been needed. In this case, the occurrence of neck hematoma did not result in significant clinical worsening of the patient.

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