

Full-Dose Thrombolysis for a Right Middle Cerebral Artery Stroke after an Acute Aortic Dissection

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Abstract

Intravenous recombinant tissue plasminogen activator (IV r-tpa) is the standard of care for patients suffering from neurological deficits due to an acute ischemic stroke within 4.5 hours in the absence of intracranial hemorrhage. We report a case of a patient with an acute right middle cerebral artery stroke due to an acute aortic dissection (Stanford Type A) who was treated with full dose IV r-tpa resulting in a good outcome.

Keywords: Acute ischemic stroke, aortic dissection, good outcome, thrombolysis

INTRODUCTION

Intravenous recombinant tissue plasminogen activator (IV r-tpa) is the standard of care for patients suffering from neurological deficits due to an acute ischemic stroke within 4.5 h in the absence of intracranial hemorrhage.^[1] In addition, endovascular treatment can be instituted in such patients if there is evidence of large vessel occlusion on imaging. Aortic dissections (Stanford Type A) are an infrequent cause of acute ischemic stroke, which are often missed on initial evaluation. Administration of thrombolysis in such patients has been shown to be associated with poor outcomes.^[2] We report a case of a patient with an acute right middle cerebral artery (MCA) stroke due to an acute aortic dissection (Stanford Type A) who was treated with full-dose IV r-tpa resulting in a good outcome.

CASE REPORT

We describe a 72-year-old Japanese female with hypertension who presented with symptoms of acute-onset left hemiparesis and dysarthria consistent with a right MCA syndrome starting at 1100 that day. The mobile stroke unit had evaluated the patient to have a National Institutes of Health Stroke Scale (NIHSS) of 6, and after a noncontrast computed tomography (CT) head, administered IV r-tpa at 1215. On arrival to the emergency department, the patient was in no acute distress with no pain and had a blood pressure of

109/50 (an interarm blood pressure was not performed), pulse rate of 100 with regular rhythm palpable distally, and a blood glucose of 81. Cardiac examination revealed no murmurs, rubs, or gallops, and the chest was clear on auscultation. Her electrocardiogram showed sinus bradycardia, and chest X-ray was significant for mild prominence of the cardiomeastinal silhouette. Her NIHSS improved to 3, and she completed her IV r-tPA infusion at 1316 receiving a full dose of 0.9 mg/Kg. Shortly, thereafter, she had an episode of emesis and generalized shaking with worsening of her right MCA syndrome to a NIHSS of 23. A STAT (emergently) head CT was obtained which did not reveal any hemorrhage. Her worsening was thought to be due to seizure activity, and she was intubated for airway protection and loaded with levetiracetam. CT angiography was obtained which showed a Type A aortic arch dissection [Figure 1a].

Cardiothoracic surgery was emergently consulted, and given her low-volume infarction in the right MCA distribution on STAT brain magnetic resonance imaging [Figure 1b], she was taken to the operating room for repair. Intraoperatively,

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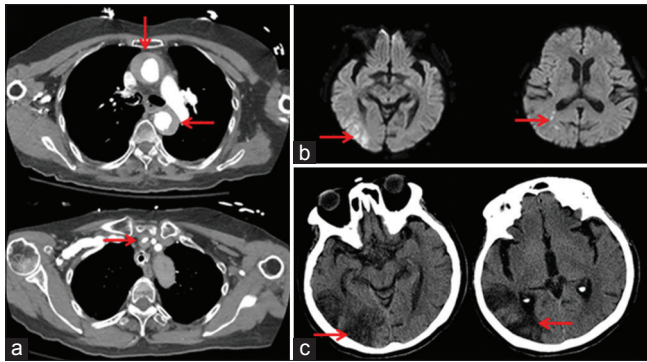


Figure 1: (a) Computed tomography chest with contrast showing a false lumen (arrows) in the ascending and descending aorta (upper image) and right common carotid (lower image) consistent with dissection. (b) Magnetic resonance imaging diffusion-weighted images of the brain showing diffusion restriction in the right temporoparietal regions consistent with recent ischemia. (c) Computed tomography scan of the head after 30 days showing evolving hypodensities in the right temporoparietal areas consistent with subacute/chronic ischemia

she received ten units of packed red blood cells, seven units of fresh-frozen plasma, twenty-eight units of platelets, forty doses of cryoprecipitate, 2 L of crystalloids, and suffered an estimated blood loss of 4 L. Postoperatively, she had a prolonged hospitalization significant for perioperative bilateral small nonhemorrhagic infarctions in cerebellar hemispheres and right thalamus [Figure 1c], *Escherichia coli* bacteriuria, and methicillin-resistant *Staphylococcus epidermidis* bacteremia (*S. epidermidis*). She underwent successful tracheostomy and percutaneous endoscopic gastrostomy tube placement. She was discharged to inpatient rehabilitation on postoperative day thirty with a NIHSS of 16 and modified Rankin scale of 4.

DISCUSSION

In the era of pushing for thrombolysis for acute stroke patients as quickly as possible, care needs to be taken to evaluate life-threatening etiologies of stroke.^[3] Aortic dissection is one such etiology and has been estimated to occur in up to 1% of hyper-acute stroke presentations.^[4] Chest radiographs are routinely done in the emergency room setting; however, they may not be helpful in ruling out aortic dissections.^[5] In our case, IV r-tpa was administered in the mobile stroke unit ambulance after a CT head to rule out an intracranial bleed. The patient had already received full-dose IV r-tpa by the time she arrived at our facility. CT angiography of the head and neck was performed as part of our hospital protocol to evaluate for large vessel occlusion that may be amenable to intervention, on which the aortic dissection was noted. The scan was then extended to the chest for better evaluation of the dissection. Aortic dissections can infrequently

extend up to the common carotid artery from which a clot can embolize and cause a stroke. IV r-tpa is usually not administered in the setting of an aortic dissection due to the potential complications of bleeding, shock, and death, and ischemic strokes secondary to aortic dissections are treated conservatively.

To the best of our knowledge, there have been a total of 9 reported cases in which IV r-tpa was administered in the setting of an aortic dissection, our case being the 10th. Six patients survived after aortic surgery and three patients died. Only one case received full-dose (0.9 mg/kg) IV r-tpa and survived after undergoing emergent surgery on the same day.^[6] Ours is the second such case. One case reported delayed surgery after administration of IV r-tpa; however, the dose was not mentioned.^[7] Acute ischemic stroke is not an absolute contraindication to surgery;^[8] however, the risk of coagulopathy is high in cases treated with thrombolysis.

In conclusion, emergent surgery for acute aortic dissection can be performed post-IV r-tpa with good outcomes. This requires balance of care between the treating physicians after weighing the risks and benefits with the patient and family.

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Conflicts of interest

There are no conflicts of interest.

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