

The first acute ischemic stroke patient treated with tissue plasminogen activator at the Lao People's Army 103 Central Hospital: Case report

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Summary

While intravenous recombinant tissue plasminogen activator (r-tPA) is standard therapy for acute ischemic stroke (AIS), its implementation in Lao PDR remains limited. We report the first r-tPA case at Lao People's Army 103 Central Hospital the second facility nationally to implement this therapy. Alteplase was administered at 4h20m post-onset per protocol. Neurological status failed to improve due to left-internal carotid artery occlusion. With endovascular thrombectomy (EVT) unavailable nationally, conservative management ensued. Subsequent imaging confirmed large left hemisphere infarction, prompting early decompressive craniectomy. The patient achieved a modified Rankin Scale score of 4 at the one-month follow-up. It marks a milestone in our hospital's stroke care and shows the urgent need for early EVT implementation to provide bridging treatment for large vessel occlusions.

Keywords: r TPA, ischemic stroke, Lao PDR.

I. BACKGROUND

Intravenous thrombolysis (IVT) with Alteplase has been approved for a long time and is used as the standard treatment for AIS ^{1, 2}. However, in Lao PDR, the implementation of this therapy remains limited due to several obstacles, including delayed hospital arrival caused by limited stroke awareness and the high cost of the thrombolytic drugs relative to income levels. To date, only one hospital in Lao PDR has reported using this therapy ³. Therefore, we report the first case of AIS treated with r-TPA at the Lao people's army 103 central hospital.

II. CASE REPORT

A 57-year-old male with a history of hypertension and diabetes presented to the emergency department with decreased responsiveness and right-sided weakness, onset 3 hours and 40 minutes earlier during dinner, as witnessed by his wife. Examination showed clouded consciousness, right hemiplegia (upper limb strength 1/5, lower limb 2/5), and aphasia. NIH Stroke Scale (NIHSS) score ⁴ was 21. Vital signs included adequate breathing (SpO₂ 97%), 85bpm pulse, and elevated blood pressure (165/90mmHg). No signs of trauma or bleeding risk were noted.

The capillary blood glucose test was normal (140 mg/dL). The patient underwent blood tests and an emergency head CT scan per the IV TPA protocol. A non-contrast CT scan performed within 25 minutes of arrival showed no abnormalities, such as hemorrhagic or hypodense parenchymal lesions

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[Figure A]. Lab results showed: Serum creatinine 0.76mg/dL, glucose 278mg/dL; hemoglobin 14.6g/dL, PBCs 241G/mL, WBCs 12G/mL; bleeding time 3 mins, clotting time 6 mins.

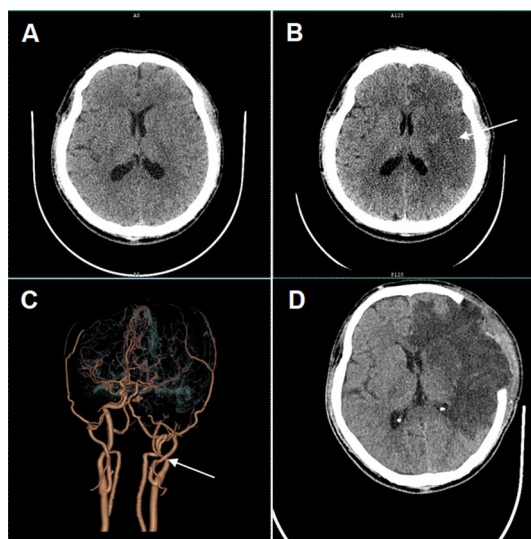


Figure 1. Head CT scan: pre-IVT injection (A); 24 hours post-IVT, showing a large left hemisphere infarction (B) and left internal carotid artery occlusion (C); post-decompressive craniectomy (D).

The patient was diagnosed with acute ischemic stroke, admitted within 4.5 hours from onset. Evaluation confirmed no contraindications to intravenous thrombolysis with alteplase. After discussing with the patient's family about the following: diagnosis, indications for intravenous thrombolysis, effectiveness of therapy and possible adverse effects, the family agreed to use IVT for the patient and completed the consent form.

The IV-rTPA therapy was administered 4 hours and 20 minutes after onset, with an Alteplase dose of 0.9mg/kg, totaling 54mg for the 60 kg patient. A 5.4mg bolus was injected intravenously over 1 minute, followed by 49.6mg infused over 1 hour. At therapy initiation, the patient's blood pressure was 160/90mmHg. Vital signs remained stable during infusion, with no changes in neurological deficit or consciousness level.

The patient was transferred to and monitored in the ICU. A repeat head CTA 24 hours after Alteplase

infusion showed no hemorrhagic lesions but a large left temporoparietal cerebral infarction without mass effect, such as midline shift or ventricular compression. CT angiography also showed occlusion at the proximal portion of the left internal carotid artery (ICA) [Figure B, C]. The patient was diagnosed with a large cerebral infarction, risking severe progression in the first week due to malignant cerebral edema complications. An interdisciplinary consultation involving the resuscitation, neurology, and neurosurgery departments was promptly conducted. Based on ESO 2022 recommendations, the patient was indicated for early decompressive craniectomy, which was performed after obtaining Lao People's Army 103 Central Hospital's family consent. The surgery and postoperative care were successful, and the post-surgery head CT scan showed good results with decreased brain swelling, and no evidence of new hematomas or other complications [Figure D]. Patient was discharged on day 12 with alert consciousness, partially improved aphasia, and right hemiplegia. At 3 months follow-up (via video call), he was able to walk independently with the support of relatives, achieving a mRS score of 4. Language skills improved quite well, as the patient could understand words, but could only speak single words, not longer phrases or sentences.

III. DISCUSSION

This is a case of cerebral ischemic stroke, arriving at the emergency department at the 4th hour of illness. From the beginning, the patient was predicted to have lower therapeutic efficacy than other cases due to 2 factors: arriving at the hospital at a late time window of "golden hours" (3-4.5 hours), and the clinical manifestations were quite severe (NIHSS 21) suggesting large vessel occlusion^{5, 6}. However, these factors were not contraindicated^{1, 2} and the decision was made to perform IVT on this patient according to the guidelines, and more importantly it was the patient's only chance because the endovascular thrombectomy has not been deployed in Laos.

This case represents the first administration of IVT for AIS at Hospital 103. Previously, there was an initial report using this therapy at Mittaphab Hospital under Teleconsultation from Thailand, however it is unclear whether the application of this therapy is maintained or not ³. Significant barriers have been hindering the wider application of IVT in Laos, including limited public awareness of the critical importance of seeking emergency treatment within the “golden hour” for AIS, the current unavailability of alteplase in Laos, and the prohibitively high cost of drug relative to average local incomes. It may also be for these reasons that cerebral vascular intervention techniques have not been implemented, especially emergency techniques such as thrombectomy in patients with large vessel occlusion.

On the second day after stroke, after detection of large cerebral infarction based on clinical neurological examination and CT, suggesting a high risk of malignant cerebral edema. The patient underwent early decompressive craniectomy within 48 hours of symptom onset as recommended by the latest guideline ⁷. Postoperatively, the patient demonstrated significant neurological improvement, as previously noted. This early surgical decompression in patients with space-occupying hemispheric infarction represents a significant advancement in stroke treatment for the 103 hospital and the Lao PDR healthcare system, where this surgery is rarely indicated for stroke treatment and typically delayed until clinical deterioration manifests as unilateral mydriasis.

IV. CONCLUSION

In conclusion, this case represents the first administration of intravenous r-tPA in an AIS patient at the Lao People's Army 103 Central Hospital, as the second hospital in Lao PDR to implement this therapy. It marks a milestone in our hospital's stroke care and shows the urgent need for early EVT

implementation to provide bridging treatment for large vessel occlusions.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Powers WJ et al (2019) *Guidelines for the Early Management of Patients With Acute Ischemic Stroke: 2019 Update to the 2018 Guidelines for the Early Management of Acute Ischemic Stroke: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association*. Stroke 50(12): 344-418.
2. Berge E et al (2021) *European Stroke Organisation (ESO) guidelines on intravenous thrombolysis for acute ischaemic stroke*. Eur Stroke J 6(1): I-Ixii.
3. Chutinet A et al (2019) *The First 10 Thrombolysis for Acute Ischemic Stroke in Lao People's Democratic Republic under Teleconsultation from Thailand*. J Stroke Cerebrovasc Dis 28(11): 104327.
4. Lyden P (2017) *Using the National Institutes of Health Stroke Scale*. 48(2): 513-519.
5. Bhatia R et al (2010) *Low rates of acute recanalization with intravenous recombinant tissue plasminogen activator in ischemic stroke: real-world experience and a call for action*. Stroke 41(10): 2254-2258.
6. Hacke W et al (2008) *Thrombolysis with alteplase 3 to 4.5 hours after acute ischemic stroke*. N Engl J Med 359(13): 1317-29.
7. van der Worp HB et al (2021) *European Stroke Organisation (ESO) guidelines on the management of space-occupying brain infarction*. Eur Stroke J, 6(2): p. Xc-cx.