

## CASE REPORT

## Defying All Odds: Successful Thrombolysis in a Nonagenarian with Posterior Circulation Infarct

RAJAH R<sup>1</sup>, WEI CM<sup>1</sup>, SAEED N<sup>1</sup>, WAN YAHYA WN<sup>1,2</sup>, WAN ZAIDI WA<sup>1,2\*</sup>

<sup>1</sup>Neurology Unit, Department of Medicine, Hospital Canselor Tuanku Muhriz, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras Kuala Lumpur, Malaysia

<sup>2</sup>Department of Medicine, Faculty of Medicine, Universiti Kebangsaan Malaysia, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras Kuala Lumpur, Malaysia

Received: 23 Mar 2024 / Accepted: 2 Jul 2024

### ABSTRAK

Kelewatan dalam mengenal pasti 'posterior circulation infarct' akut boleh menyebabkan kelewatan dalam rawatan dan kadar kematian yang tinggi. Terdapat peningkatan dalam kejadian strok di kalangan orang tua. Rawatan strok akut untuk orang tua sangat mencabar disebabkan oleh kekurangan data mengenai komplikasi dan hasil fungsi mereka. Seorang wanita berusia 97 tahun mengalami kelemahan di bahagian kiri badannya ketika bangun dari tidur dan pening dua hari sebelumnya. Apabila tiba di hospital, skala 'Glasgow Coma' (GCS) beliau adalah E3V4M6, tekanan darah 162/112 mmHg, skor NIHSS 10, kekuatan di bahagian kiri badan 3/5 dan di bahagian kanan badan 4/5. Pemeriksaan tomografi komputer (CT) otak menunjukkan trombolisis pada segmen P2 arteri serebrum posterior sebelah kanan dan arteri basilar distal, dengan 'posterior circulation mismatch'. Trombolisis diberikan segera. Beliau dibenarkan discaj dengan NIHSS 5, GCS E4V5M6 dan kekuatan pada kedua-dua anggota badan 4/5. Beliau diberi Apixaban seumur hidup untuk pencegahan strok dan menjalani rehabilitasi pasca-strok. Masa thrombolisis dianggarkan berdasarkan masa terakhir pesakit kelihatan sihat. Kajian telah menunjukkan bahawa pesakit yang berusia 80 tahun ke atas yang hadir ke hospital dalam masa 3-4.5 jam selepas gejala, menunjukkan pemulihan yang baik dalam aspek fungsi anggota badan jika dirawat dengan trombolisis intravena atau trombektomi, tanpa peningkatan risiko pendarahan otak dan kematian.

**Kata kunci:** Infark cirkulasi posterior; NIHSS; orang tua; pening; trombolisis

**Address for correspondence and reprint requests:** Dr Wan Asyraf Wan Zaidi, Neurology Unit, Department of Medicine, Level 8, Clinical Block, Hospital Canselor Tuanku Muhriz, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras Kuala Lumpur, Malaysia. Tel: +6013-3884836 Email: drwawz87@gmail.com

## ABSTRACT

A delay in recognising acute posterior circulation infarct (POCI) can cause a delay in treatment and high mortality rate. There has been an increasing trend in incidence of stroke among the elderly. Treating acute stroke in elderly has been challenging due to the lack of data on the functional outcome and mortality risk. A 97-year-old woman had left sided weakness upon waking up from sleep and dizziness two days prior. Upon arrival, her Glasgow Coma Scale (GCS) was E3V4M6, BP 162/112 mmHg, NIHSS score 10, left sided power 3/5 and right sided power 4/5. Her computed tomography (CT) angiography brain showed P2 segment of right posterior cerebral artery and distal basilar artery thrombosis, with a posterior circulation territory mismatch. Thrombolysis was given immediately. She was discharged with NIHSS 5, GCS E4V5M6 and power bilateral limbs 4/5. She was put on lifelong Apixaban for stroke prevention and underwent post-stroke rehabilitation. The time of occlusion was decided based on the time a patient was last seen well. Studies have shown that patients aged 80 years and above presenting within 3-4.5 hours from symptoms, perform well with both intravenous thrombolysis and thrombectomy, with no increased risk for intracranial hemorrhage and death.

Keywords: Dizziness; elderly; NIHSS; posterior circulation infarct; thrombolysis

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## INTRODUCTION

Stroke is a major health burden in Malaysia. The National Stroke Registry of Malaysia has reported a total of 11,284 cases of stroke from the year 2009 to 2016 (Feigin et al. 2021). Stroke was also known to be one of the top three causes of death in Malaysia, after ischemic heart disease and pneumonia (Aziz et al. 2016).

Posterior circulation infarct (POCI) stroke is described when there is impaired perfusion to the brainstem, cerebellum, thalamus and/or occipital lobe, causing significant neurological deficit. It was relatively uncommon, accounting for only 20% of all strokes (Mozaffarian et al. 2016). POCI is often misdiagnosed due to its wide range and non-specific symptoms (Banerjee et al. 2018). Almost half present with dizziness, followed by unilateral limb weakness, dysarthria, headache, and

nausea or vomiting (Schneider et al. 2023).

Acute POCI can suffer from early neurological deterioration (END), leading to symptomatic intracranial hemorrhage and malignant edema (Ntaios et al. 2011; Seners & Baron. 2018). The risk factors include distribution of lesions in pons, progression of temporo-occipital lobe lesion and large arterial atherosclerosis (Li et al. 2023). If treatment is delayed, POCI can cause significant disability and high mortality.

Malaysia is expected to transition towards an aging nation in the upcoming years as there will be a rise of an aging population up to 14% by the year 2028 (Noor et al. 2020). Therefore, we see more elderly patients admitted for stroke. However, there is very limited data with regards to the success of treatment of stroke (intravenous thrombolysis and/or

mechanical thrombectomy) in this group owing to the misconception that they tend to have a poorer outcome.

We would like to report a case of a previously well nonagenarian, who presented to us for POCI in atrial fibrillation (AF) with a National Institute of Health Stroke Scale (NIHSS) of 20, responded well to the standard intravenous thrombolysis. She was discharged home well, with NIHSS 5 and a modified Rankin Scale (mRS) of 4.

### CASE REPORT

A 97-year-old woman who was previously well, was brought in by her daughter to the Emergency Department with complaints of drowsiness and left sided weakness upon waking up from sleep. She also complained of dizziness and difficulty in ambulation 2 days prior. She was otherwise activities of daily living (ADL) independent, assisted with a walking stick. Stroke call was activated.

On examination by the Neurological team, she appeared drowsy with a Glasgow Coma Scale (GCS) of E3V4M6. The pupils were equal bilaterally, BP 162/112 mmHg, heart rate 83 beats per minute and glucose level of 5.4 mmol. There was facial asymmetry, dysarthria, and upwards gaze paresis with skew deviation. The power of the right upper and lower limb was 4/5, whereas power of the left upper and lower limb was 3/5. Electrocardiography showed rate controlled atrial fibrillation. NIHSS score was 10/42.

She was subjected to an urgent computed tomography (CT) brain plain and CT angiography (CTA), which revealed P2 segment of right posterior cerebral artery (PCA), ostium of left PCA and distal basilar artery thrombosis (Figure 1). Perfusion scan showed PCA territory mismatch (Figure 2). Immediate reperfusion therapy using intravenous alteplase was decided by the attending Neurologist and she was admitted to the Stroke Care Unit for close observation.

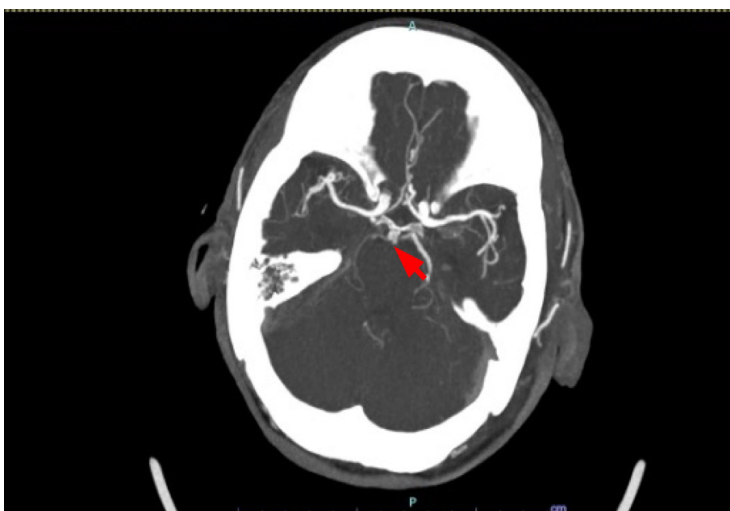


FIGURE 1: CTA showed P2 segment of right posterior cerebral artery (PCA), ostium of left PCA and distal basilar artery thrombosis

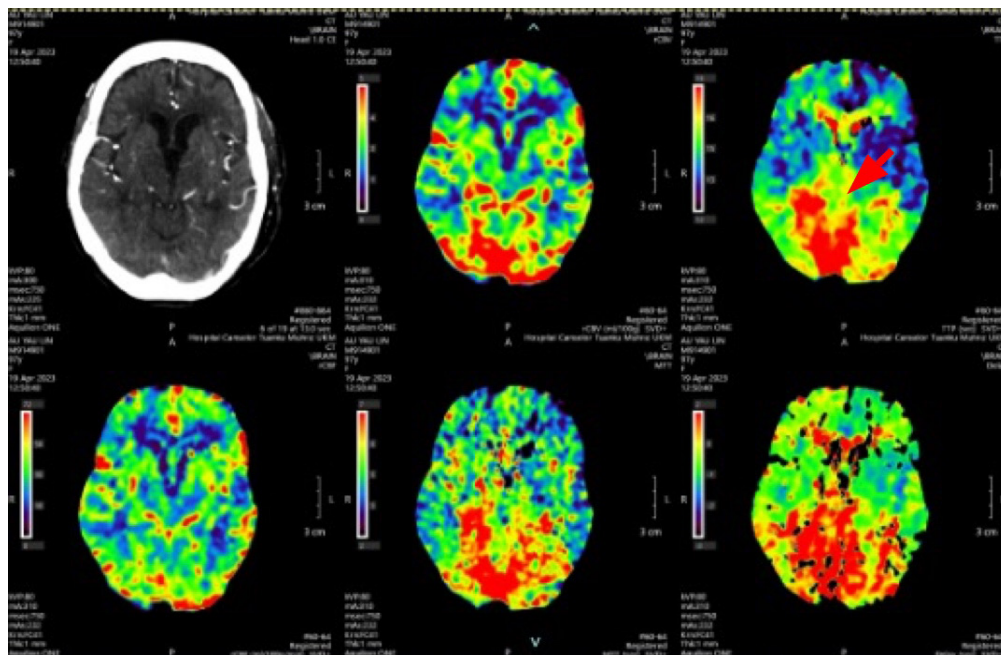


FIGURE 2: Perfusion scan showed PCA territory mismatch

Twenty-four hours post thrombolysis, her NIHSS score improved to 5/42. The GCS was full. The power of the left upper and lower limb improved to 4/5. She required a wheelchair for mobilisation. Her echocardiogram showed a good left ventricular ejection fraction and a dilated left atrium, and no clot. As for the blood pressure, it was within normal range in ward, with a systolic blood pressure of 130-140 mmHg and a diastolic blood pressure of 60-70 mmHg. She was discharged one week later with Apixaban 2.5 mg twice daily, Atorvastatin 40 mg once at night, Perindopril 8 mg once daily, and Amlodipine 10 mg once daily.

## DISCUSSION

It is well ascertained that patients with acute anterior circulation stroke treated

with intravenous thrombolysis presenting within 4.5 hours from symptom onset have a good outcome (Lees et al. 2010). On the other hand, it is believed that patients with acute basilar artery occlusion (BAO) can still have a better outcome from reperfusion therapy despite presenting beyond 8 hours (Noufal et al. 2009). This is because a higher white matter composition and a better collateral supply in the posterior circulation allow more resilience towards ischemia, and thus prevent early tissue necrosis (Lindsberg et al. 2015).

The Basilar Artery International Cooperation Study (BASICS) trial was the first observational study conducted to assess the functional outcome of patients with BAO in relation to their time to reperfusion therapy. In the present study, the estimated time of BAO referred to the

time of onset of acute symptoms leading to the clinical diagnosis of stroke, or, if not known, the last time the patient was seen well prior to symptoms onset. This study proved that early reperfusion therapy in patients with BAO leads to a favourable outcome (Vergouwen et al. 2012).

Our patient complained of dizziness and difficulty in ambulation for two days prior. However, she presented to the Emergency Department following left sided weakness and drowsiness upon waking up from sleep in the morning. At this juncture, the estimated time of BAO was taken from the time she woke up. Hence, she was given immediate intravenous alteplase as the reperfusion therapy.

Treating an elderly patient with stroke has always been a dilemma, especially for Neurologists. The family members often believe that patients will have a high bleeding risk and a poor outcome when subjected to reperfusion therapy. Thus, they usually lean towards the best medical therapy (antiplatelet and statin). A recent prospective study conducted has concluded that elderly patients receiving thrombolysis using alteplase experienced a better short term functional outcome without a risk of in-hospital mortality, albeit a higher incidence of symptomatic intracerebral hemorrhage (Li et al. 2024)

The American Heart Association/ American Stroke Association mentioned that patients below the age of 80 or 80 years above, presenting with stroke symptoms within 3 hours from symptoms onset, treatment with intravenous tissue plasminogen activator (tPA) is a must (Powers et al. 2019). Conversely, patients more than 80 years of age, presenting within 3 to 4.5 hours from symptom onset were not associated with increased

intracranial bleed, poor functional outcome and higher risk of mortality when treated with intravenous tPA (Alshekhlee et al. 2010; Mowla et al. 2021).

Interestingly, the elderly patients were also proven to benefit from mechanical thrombectomy, if they fulfilled the designated criteria (Dunphy et al. 2023). And so, age should not be a hindering factor in providing acute care admission and/ or reperfusion therapy for the elderly especially when they present within the time window (Hubbard et al. 2017; Malaysian Society of Neurosciences 2020).

## CONCLUSION

Acute POCI benefits from reperfusion therapy particularly when presented with early symptoms onset. In addition, age should not be considered as a contraindication when deciding on mode of treatment in acute stroke.

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