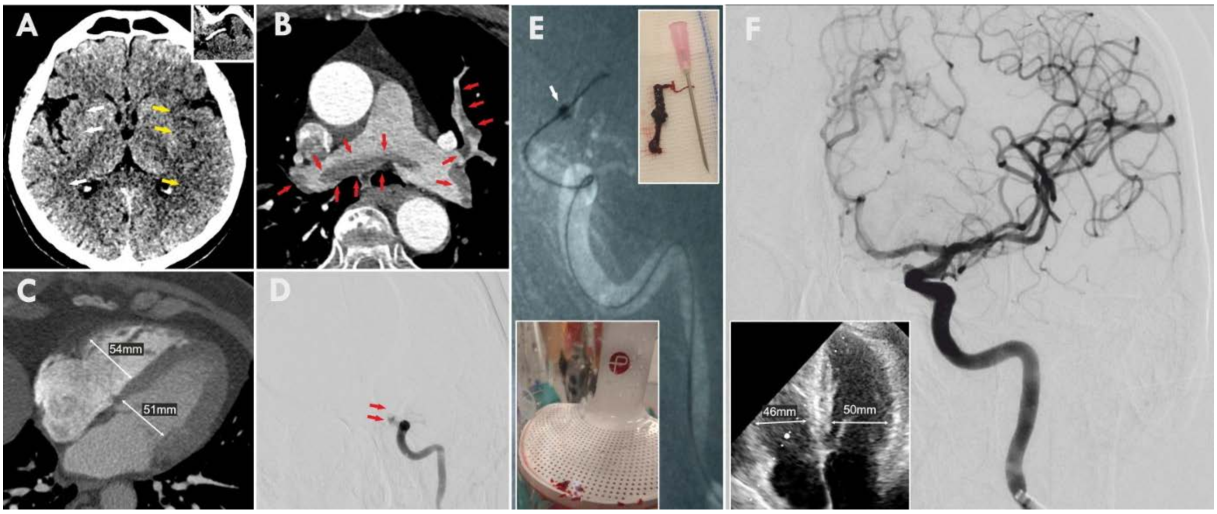
***Supplementary material***

---

*Tekieli Ł, Tomaszewski T, Musiał R, et al. Large-vessel occlusion, large thrombus burden acute stroke in acute pulmonary embolism: a single multi-specialty multi-skill team treatment optimization. Kardiol Pol. 2021.*






**Supplementary Figure 1.** Non-invasive and invasive imaging in a 74-year-old man presenting with acute, major left (dominant) hemispheric stroke and increased respiratory effort with reduced arterial blood saturation ($SaO_2$ 88%). Emergent cerebral plain CT (**A**, 12 min after arrival) showed early signs of left hemispheric anterior circulation infarction with effacement of the sulci and mild cortical hypodensity (compare the right vs left hemisphere cortex for asymmetry, white/yellow arrows) in absence of intracerebral bleeding; Alberta Stroke Program Early Computed Tomography (ASPECTS) score was 7, indicating moderate cerebral tissue loss. Hyperdense middle cerebral artery sign was present, suggestive of its thrombolytic occlusion (inset); IV thrombolysis (stroke protocol) was initiated instantaneously. CT angiography (2 min after thrombolysis onset) demonstrated radiologically massive PE (**B**, the red arrows) with the enlarged right ventricle, indicating RV struggle (**C**). Distal LICA occlusion was present, with moderate-only collateral supply from the right to the left hemispheric vessels. The right ventricle enlargement (**C**) was accompanied by clinical signs of intermediate-high risk PE. Norepinephrine IV infusion was started to increase arterial blood pressure to ≈140–160 mm Hg systolic to enhance collateral supply as the cerebral autoregulation spontaneous hypertensive response was likely offset by the PE effect. Cerebral angiography (**D**, a NeuronMax88 8F guiding catheter, Penumbra, the white arrow marks the catheter tip and some mild vasospasm) confirmed LICA T-occlusion (red double-arrow). Large-bore aspiration catheter (Jet 7, Penumbra, catheter tip marked with the white arrow **E**) was advanced up to the thrombus head with a cerebral guidewire (Synchro 0.014", Stryker) and microcatheter (3Max, Penumbra) support. Vacuum pump-assisted (**E**, bottom-left inset) mechanical aspiration was performed for 90 sec (backflow absent). JET-7 was removed under active aspiration, followed by the NeuronMax guiding catheter (backflow absent) active manual aspiration removal. A large embolus was retrieved en-block (**E**, top-right inset) with several additional small emboli visible in the aspiration pump filter (**E**, bottom-left). Angiography (**F**) demonstrated a "first-pass" optimal cerebral reperfusion effect (TICI-3, absence of any residual embolism, absence of embolism-to-new-territory) achieved swiftly after the diagnosis of large vessel occlusion stroke. The Troponin I level lab evaluation, available at the cerebral embolectomy completion point was 0.146 ng/ml (normal level ≤0.014 ng/ml), consistent with the RV myocardial strain-related injury with the PE load (renal function normal). Right femoral vein puncture was considered for transition to PE catheter embolectomy (clot separator-assisted aspiration, Indigo system, Penumbra), using the same aspiration pump (**E**). Control echocardiography, however, showed RV dilation reduction (**F**, bottom-left inset) likely resulting from the ongoing IV thrombolysis effect on PE magnitude. This was accompanied by the patient hemodynamic stabilization (spontaneous blood pressure 110/75 mm Hg, heart rate 95/min), and a team decision was made to put the transcatheter pulmonary embolectomy on hold. See text for further details; for transoesophageal echocardiography performed 4 days later see Supplementary material, *Figure S2*

Abbreviations: CT, computed tomography; LICA, left internal carotid artery; PE, pulmonary embolism; RV, right ventricle

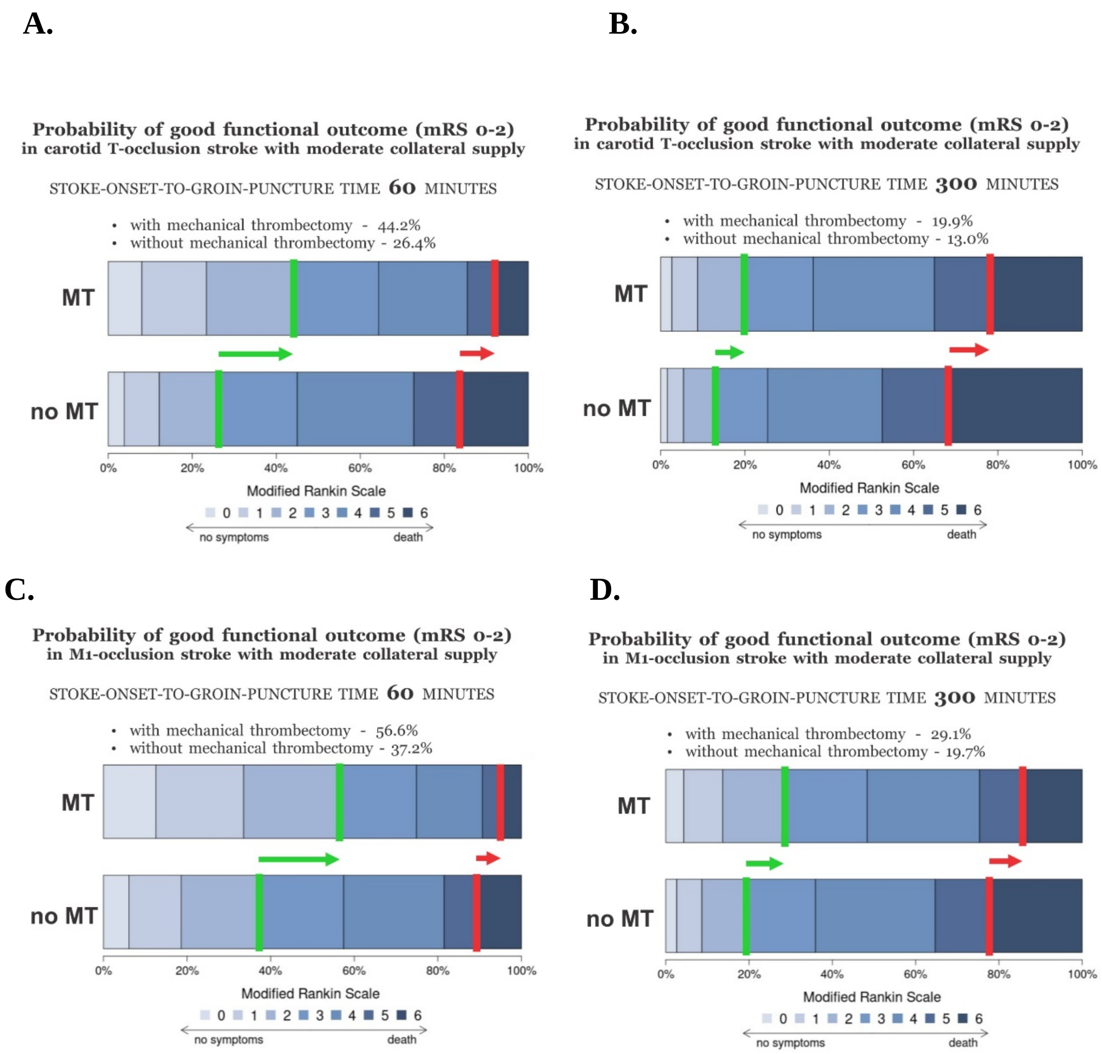



**Figure S1.** MT effect on clinical outcomes probability in our patient (**A**, **B**) according to Mr Predicts model (https://www.mrclean-trial.org/mr-predicts.html, modified); a validated model to determine the benefit of endovascular treatment for acute ischemic stroke. **C** and **D** show, for a comparison, outcome probability for a patient with similar characteristics except that the cerebral artery occulsion is more distal (M1).

Characteristics taken into consideration include age, baseline NIH-SS, pre-stroke RS, diabetes, baseline systolic blood pressure, baseline glucose level, i.v. thrombolysis, ASPECTS score, location of occlusion, collateral score, and estimated onset-to-groin puncture time.

**A**. Predicted probability of good functional outcome (mRS 0–2) for the patient described in our work if the onset-to-groin-puncture time is 60 minutes. **B.** Predicted probability of a good functional outcome (mRS 0–2) for the patient described in our work if the onset-to-groin-puncture time is 300 minutes. **C.** Predicted probability of good functional outcome (mRS 0–2) for a patient with similar clinical characteristics, except that the occlusion is more distal (M1) rather than T-occlusion, if the onset-to-groin-puncture time is 60 minutes. **D.** Predicted probability of good functional outcome (mRS 0–2)  for a patient with similar clinical characteristics, except that the occlusion is at M1 (rather than T-occlusion), if the onset-to-groin-puncture time is 300 minutes.

Note that in both scenarios MT increases the chance of a good clinical outcome (functional independence, mRS ≤2) ≈2-fold in relation to lack of MT treatment. However, with MT initiated within 1 h from symptom onset, a carotid T-occlusion patient has ≈50% of a good clinical outome; this is reduced to ≈20% if the treatment is initiated 5 h from symptom onset (still, with the latter, 1 in every 5 patients are then prevented from disability and can continue their normal life). While the presence of stroke onset witness to trigger immediate referral (our patient's case) cannot be controlled, the level of public awareness and healthcare system logistics are fundamental factors of undelayed MT — a guideline-mandated treatment. Particularly important is an effective (real-life) swift patient access to MT, bypassing any delays resulting from avoidable transportation/s to Level-1 centres. This is further illustrated in comparison of **C** and **D** vs. **A** and **B** (with a more distal oclusion, the relative effect of thrombectomy is similar to that for T-occluion, but absolute outcomes are better, particularly with rapid MT; T-occlusions are more difficult to resolve – in particular with an absence of distal cerebral emoblism). Neither scenario takes into consideration coexisting intermediate-high risk PE, aggravating cerebral ischemia through arterial blood desaturation and reducing systemic arterial blood pressure (see text).

Guideline-empowered Thrombectomy-Capable Centres (Level-2 stroke centres) play a fundamental role in ensuring the patient rapid access to MT — a pivotal factor in the individual, family, and societal benefit of MT (for details see manuscript references 1, 2 and 5, and references therein)

Abbreviations: ASPECTS, Program Early Computed Tomography; mRS, modified Rankin Scale; MT, mechanical thrombectomy; NIH-SS, National Institute of Health Stroke Scale; RS, Rankin Scale

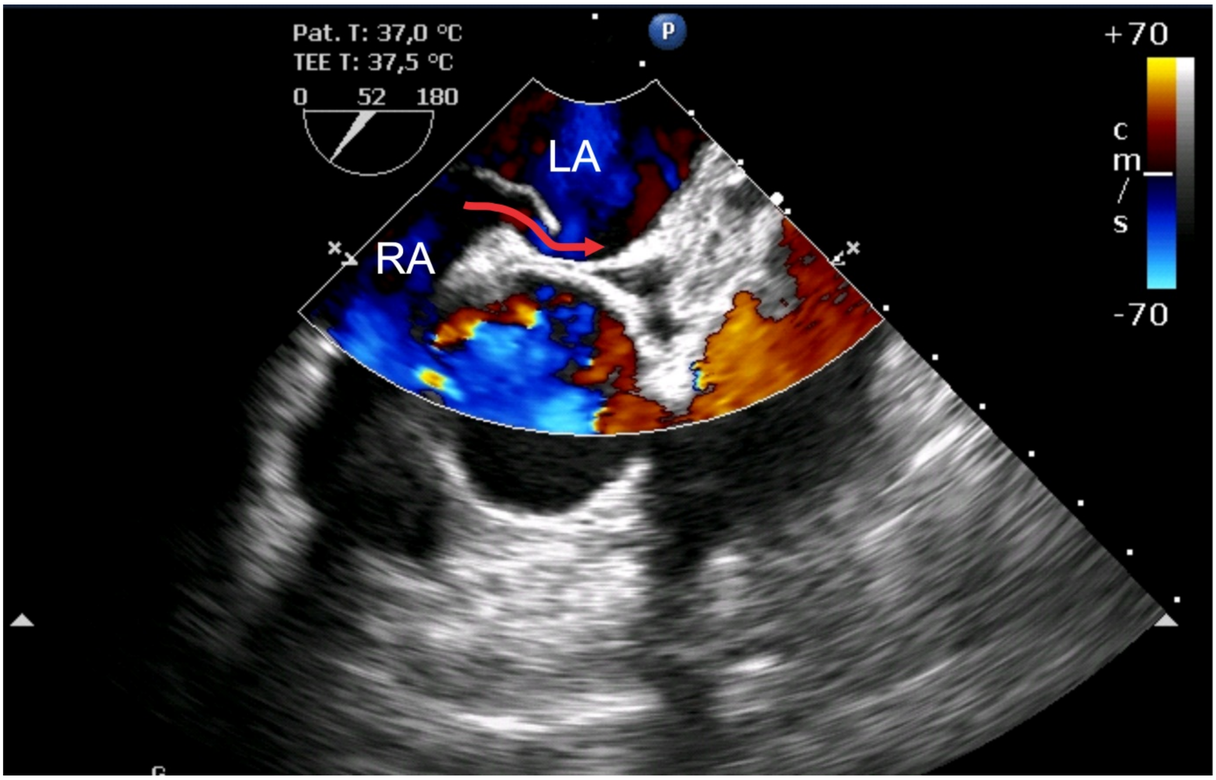



**Figure S2.** Transoesophageal echocardiography performed 4 days after the stroke mechanical thrombectomy. Transoesophageal echocardiography revealed a large PFO with a flow (arow, red) from the RA to the LA – a mechanistic link between the simultaneously ocurring PE and acute ischaemic stroke. The patient, pending his neurologic recovery, is now scheduled for PFO percutaneous closure to complete (along PE diagnostic work-up) the guideline-mandated interventional management

Abbreviations: LA, left arium; PE, pulmonary embolism; PFO, permanent foramen ovale; RA, right atrium