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Rescue Intracranial Stenting in acute Ischemic Stroke

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Abstract

Background

In acute ischemic stroke (AIS) caused by intracranial large vessel occlusion, rescue intracranial stenting (RIS) has been recently a treatment option to achieve recanalization in patients with the failure of mechanical thrombectomy (MT). Nevertheless, there are few studies supporting this beneficial treatment in two cerebral circulations. We aimed to analyze whether the use of RIS would improve prognosis “non-poor” of patients at 3 months.

Methods and Findings

This was a interventional, single-arm study in patients with AIS who were treated with rescue stenting at Can Tho S.I.S hospital. Inclusion criteria consisted of: evidence of intracranial large vessel occlusion, absence of intracranial hemorrhage and severe stenosis or reocclusion after MT. Tandem lesion, loss to follow-up after discharge and a severe or fatal combined illness before AIS were excluded. The primary outcome was the “non-poor” outcome rate at 3 months and postprocedural symptomatic intracerebral hemorrhage (sICH). The study is registered with ClinicalTrials.gov, NCT04986774.Between August 2019 and May 2021, 85 eligible patients were comprised of 82 (96.5%) successful recanalization and 4 (4.7%) sICH. “Non-poor” outcome comprising of good (mRS 0 - ≤ 2) and fair (mRS 3). “Non-poor” outcome at 3 months occurred 47 (55.3%), in which there were 35 (41.2%) good outcome. DAPT was associated with new infarcts (RR = 0.1; 95%CI 0.01 - 0.7, NNT = 2) and sICH (RR = 0.1; 95%CI 0.01 - 0.9; NNT = 2). MRI 3 Tesla evaluated diagnostic occlusive lesions with sensitivity (Se) = 98.5%, positive Likelihood Ratio (LR+) = 3.5. The pc-ASPECTS < 6 points was associated with poor outcome (RR = 2.1, 95% CI 1.2- 3.7). Many predictors from demographic, history, time onset, dysphagia, imaging of MRI 3 Tesla, preprocedure, procedure and postprocedure were demonstrated the influence on poor outcome after RIS significantly (all RR > 1, all p < 0.05). The main limitations of the study was conducted in a single center, these results from clinical symptoms to imaging of MRI 3 Tesla could not only be influenced by selection bias but also not generalize to other countries in Asia.

Conclusions

The RISIS trial suggests that RIS could be an important alternative and additional treatment afterfailureMT despite low proportion of postprocedural sICH.

Trial registration

Clinicaltrials.gov, Identifier:NCT04986774.

DOI

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Procedures

The anaesthesia used was sedation or general anaesthesia before intervention. If after identifying large artery occlusion because of thrombus by SWI sequence or/ and angiography, the most commonly mechanical thrombectomy used was aspiration or combining aspiration with stent retriever. The recanalization result was graded by the modified Treatment In Cerebral Infarction (mTICI) score. If

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mechanical thrombectomy recanalization failure (mTICI < 2b) or large vessel severe stenosis after angiography (measured by WASID method with severe from 70 to 99%), we decided to stent after using a dual antiplatelet loading dose (300 mg clopidogrel and 162 mg aspirin) like Chang's study (aspirin, 100 - 500 mg and clopidogrel, 300 mg) via nasogastric tube. Besides, during the procedure, intravenous heparin bolus 3000 - 5000 unit was given to patients to maintain a target activated clotting time of 250 to 300 seconds. Like the angioplasty protocol of WEAVE trial, we used the balloon size with nominal diameter to be 80% of the true luminal one or about 60% in lesions near visible perforators. After deploying the stent, if the residual stenosis remained ≥50%, we could dilate balloon within the stent. Successful stent deployment across the lesion was from 0% to 20% residual stenosis poststenting. Total procedure time was defined as the interval from groin puncture to completion of the procedure. After completing procedure, the patient was transferred to Intensive Care Unit, monitored continuously clinical signs and maintained systolic blood pressure from 120 - 140 mmHg. After 24 hours, a head CT scan was performed to determine complication: cerebral swelling, postprocedural new infarcts and symptomatic intracerebral hemorrhage (was defined as patient's intracerebral hemorrhage with postprocedural mRS ≥ 5 and there were no other evident causes for the increased mRS). If CT showed no hemorrhage, patient started with clopidogrel 75 mg and aspirin 81 mg orally every day for 3 months, then only clopidogrel 75 mg for remaining life and coupled with intensive management of vascular risk factors. If haemorrhage was in CT, we could consider to use only clopidogrel 75 mg or suspend antiplatelet treatment.

Outcomes

At 3 months, poor clinical outcome was assessed by applying the mRS (mRS 4 - 6) and the primary endpoint was the "non-poor" outcome comprising of good (mRS 0 - ≤ 2) and fair (mRS 3). These scores were evaluated through telephone interviews.

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